

Abhishek Dubey

Assistant Professor,
Computer Science and Computer Engineering,
Vanderbilt University
Senior Member, IEEE
ScopeLab: <https://scopelab.ai/>
Smart Transit: <https://smarttransit.ai/>
Statresp: <https://Statresp.ai/>
Google Scholar: <https://bit.ly/2vfhNN8>

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Brief Biography

Dr. Abhishek Dubey is an Assistant Professor of Electrical Engineering and Computer Science at Vanderbilt University, Senior Research Scientist at the Institute for Software Integrated Systems. Abhishek directs the [ScopeLab](https://scopelab.ai/) at the Institute for Software Integrated Systems and is the co-lead of Vanderbilt Institute for Smart Cities Operation and Research (VISOR). His research focuses on the resilient design and operation of complex large-scale transportation and electrical cyber-physical systems. In particular he emphasizes decision-theoretic methods, component-based software engineering, anomaly detection and fault diagnosis, resilience and recovery, and decentralized operations for these CPS. He currently leads smart and connected community research efforts focusing on design and optimization of public transit systems in Chattanooga, TN and Nashville, TN through his group smarttransit.ai and the emergency response system optimization through his group [statresp.ai](https://Statresp.ai/).

His key contributions include a robust incident prediction and dispatch system developed for Nashville Fire Department, a privacy-preserving decentralized system for peer-to-peer energy exchange, and online fault detection and isolation in breaker assemblies in power transmission lines. His other contributions include middleware for online fault-detection and recovery in software-intensive distributed systems and a robust software model for building cyber-physical applications, along with spatial and temporal separation among different system components, which guarantees fault isolation. His work has been funded by the National Science Foundation, NASA, DOE, ARPA-E, AFRL, DARPA, Siemens, and Cisco through grants of more than 8 million as PI and 27 million dollars as Co-PI. Overall, he has published over 150 articles with an h – *index* of 29.

Abhishek completed his Ph.D. in Electrical Engineering from Vanderbilt University in 2009. He received his M.S. in Electrical Engineering from Vanderbilt University in August 2005 and completed his undergraduate studies in Electrical Engineering from the Indian Institute of Technology, Banaras Hindu University, India in May 2001.

Appointments

- 2016- Present
- Assistant Professor**, Computer Science and Computer Engineering, Department of Electrical Engineering and Computer Science, Vanderbilt University
 - Senior Research Scientist, Institute for Software Integrated Systems, Vanderbilt University
 - Director, ScopeLab, Institute for Software Integrated Systems, Vanderbilt University (ISIS)
 - Co-lead, Vanderbilt Institute for Smart Cities Operation and Research (VISOR)
 - Faculty Affiliate, Vanderbilt Center for Transportation and Operational Resiliency (VECTOR)

- Faculty Affiliate, Vanderbilt Data Science Institute
- Research Interests: Resilience of Cyber Physical Systems, Fault Detection and Diagnostics, Middleware and Model-based design, Artificial Intelligence, Smart Cities, Transit and Emergency Response Operations

- 2014-2016 **Adjunct Assistant Professor**, Computer Science and Computer Engineering, Department of Electrical Engineering and Computer Science, Vanderbilt University
- 2009-2016 **Research Scientist**, Institute for Software Integrated Systems, Vanderbilt University
- 2003-2009 Research Assistant, Department of Electrical Engineering and Computer Science, Vanderbilt University
- 2008 Research Intern, IBM T.J Watson Research Center, Hawthorne, NY
- 2006 Research Intern, General Motors, Technical Center, Warren, MI
- 2001-2003 Software Engineer, IBM Global Services, India

Education Background

- 2009 **PhD, Electrical Engineering**, Vanderbilt University, Nashville, TN
- Dissertation: Using Model-Based Techniques for Improving Performance and Reliability in High-Performance Scientific Computing.
 - Advisor: Dr. Gabor Karsai - Professor, Electrical Engineering and Computer Science Department, Vanderbilt University.
- 2005 **M.S., Electrical Engineering**, Vanderbilt University, Nashville, TN
- Thesis: Metamodel Based Language and Computation Platform for Algorithmic Analysis of Hybrid Systems.
 - Advisor: Dr. John Koo - Director, Cyber-Physical Systems at ASTRI.
- 2001 **B.Tech. (Bachelor of Technology)** with Honors, Electrical Engineering, Indian Institute of Technology, Banaras Hindu University, Varanasi, India

Awards and Honors

- 2019 Best paper award Smartcomp 2019.
- 2019 Invited to present my work at the Arab American Frontiers organized by the National Academy of Engineering in Cairo, Egypt in 2019.
- 2019 Invited to discuss the future of work in power systems at the Shonan seminar in Japan in 2019.
- 2017 Connected Nashville and NTC Recognition for Technology Committee Leadership.
- 2017 Transit Hub was the best project finalist.
- 2016 Letter of commendation from the Chancellor's Office for the Smart Cities work in Nashville
- 2015 IEEE Senior Member Promotion.

2012 Best paper award ICAS.

Research Experience

- Research Topics** Resilient design and operation of complex large-scale cyber-physical systems with an emphasis on artificial intelligence and decision-theoretic methods, fault-diagnostics and recovery, component-based software engineering, and decentralized middleware.
- Application Domains: Emergency Response Systems, Public Transit, and Electrical Power Grids.
- Publications** 37 Journal articles. 10 Book chapters. 21 highly selective conferences with acceptance rate < 34%. Overall more than 150 papers with approximately 2500 citations and an *h-index* of 27.
- Invited talks** > 26 invited presentations (not including paper presentations) at various conferences, NSF workshops, university, and industry.
- Software** Notable software products include
- ARINC-653 emulator for Linux and the first open source operating system implementation for Future Airborne Capability Environment (FACE).
 - Modular platform for integrating blockchain and CPS called SolidWorx
 - CHARIOT, a reasoning engine for online reconfiguration of cyber physical system software assemblies.
 - ReSonAte, A Runtime Risk Assessment Framework for Autonomous Systems
 - TRANSAX - a middleware for transactive energy systems
 - Smart Transit - Software as a service cloud platform for transit agencies focusing on energy and schedule optimization
 - Statresp - Software as a service cloud platform for state department of transportation and city emergency departments focusing on resource allocation, optimization and dispatch
 - Resilient Information Architecture Platform for Smart Grid, which is now a Linux foundation project
 - MODICUM - online market software for enabling computational outsourcing for batch computations in smart cities.
 - F6MDK, a full stack implementation of a containerized application system for fractionated satellites.
- Patents** One provisional patent for Method and System for Secure and Private Forward Trading Platform in Transactive Microgrids. There are three submitted and pending patents: (1) Method and System for Data-Driven Forecasting of Cascading Effects in Networked Systems , (2) Decentralized Method and System for Real-Time Anomaly Detection In Transportation Networks, and (3) Mechanism for energy prediction across mixed vehicle fleet using multi-task learning.
- Research Grants** Total grant support in the PI position as an assistant professor is 8.1 million. Grant support as a PI in a research scientist position from 2009 to 2016 was \$526,294. Total grant support as a Co-PI as an assistant professor is approximately 16.6 million. My cumulative grant support throughout my career as a researcher is approximately 36 million. Grantors include NSF, DARPA, DOE, DOD, ARPA-E, ARL, Siemens, Cisco systems, NASA, and AFOSR.
- Professional Research Service** Served 14 times as a chair or co-chair for international conferences during my career and over 30 times as a program committee member. Frequent reviewer for research programs at NSF, NASA, and DOE.

Research in Practice The research work in the public transit and emergency response area has been developed collaboratively with the Nashville, TN, and Chattanooga, TN city departments and has been frequently cited in the press. CHARIOT, ARINC-653 Component Model, and RIAPS are now open-source software.

Teaching Experience

- 2021S **Topics in Big Data** (CS 4266/5266), Vanderbilt University
- Developed asynchronous and online content for the course. The focus of the course is principles and practices of data storage, data modeling techniques, data processing and querying, data analytics, and applications of machine learning using these systems. The course was also revamped to provide several smart city-related projects to the students and transitioned to use Amazon Web Services for cloud and big data engineering assignments.
 - 38 undergraduate and 5 graduate students
- 2020S **Topics in Big Data** (CS 4266/5266), Vanderbilt University
- Developed new content for the course
 - 47 students
 - Rating: 4.20/5
- 2020S **Data Science Applications for Smart Cities** (UNIV 3360/5360), Vanderbilt University
- Co-taught with Profs. Gautam Biswas (lead), Claire Smrekar, Jonathan Gilligan, Mark Ellingham as part of the university initiative for trans-institutional courses. Developed Internet of Things Material for the course.
 - The course introduces non-engineering students to technical and data science challenges that arise from unprecedented growth in our cities and metropolitan areas making it hard to provide the infrastructure and resources needed for sustainable development and maintaining the needed quality of life for all citizens.
 - 21 students
 - Rating: 3.6/5
- 2019F **Reliable Distributed Systems** (CS 3891/5891), Vanderbilt University
- Special topics course focused on systems and software reliability for big data and cloud systems.
 - 10 students
 - Rating: 4.40/5
- 2019S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- Introduction to Operating Systems. Course focused on the application of fundamental concepts of resource management and concurrency. The course was transitioned to use Amazon Web Services and the focus was shifted to Linux kernel development and related projects.
 - 37 students
 - Rating: 3.89/5
- 2018F **Reliable Distributed Systems** (CS 3891/5891), Vanderbilt University
- 26 students
 - Rating: 4.20/5
- 2018S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 35 students

- Rating: 4.60/5
- 2017F **Reliable Distributed Systems** (CS 3891/5891), Vanderbilt University
- Developed the material for the new course on software and system reliability for big data and cloud environments.
 - 11 students
 - Rating: 4.50/5
- 2017S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- Revised the course content to include material on virtualization
 - 32 students
 - Rating: 3.92/5
- 2016F **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 42 students
 - Rating: 4.27/5
- 2016S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 42 students
 - Rating: 4.21/5
- 2015F **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 49 students
 - Rating: not available
- 2015S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 38 students
 - Rating: 4.05/5
- 2014F **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- 40 students
 - Rating: not available
- 2014S **Principles of Operating Systems** (CS 3281/5281), Vanderbilt University
- Revised and developed the curriculum for an introduction to operating systems.
 - 29 students
 - Rating: 3.84/5

— Courses for Industry

- 2019 **Industrial Applications of Internet of Things**, Marriott
- Developed an industrial course for Marriott in collaboration with Prof. Aniruddha Gokhale to provide an overview about the trends, concepts, and challenges in using the internet of things with a focus on the cloud computing aspects and the hotel industry use cases.

Research Grants (Total \$36,385,656)

Grants as PI (Total: \$8,722,003)

- 2021–2022 Federal Transit Authority. **Utilization of Crowd Data and Predictive Algorithms for Improved Transit Service and Experience.** Award Amount: \$98,000.
- 2021–2022 Cisco. **EdgeNet- An online Edge Computing Based Generative Anomaly Detection and Prognostics Solution for Networked Equipment at Customer Premises.** Award Amount: \$100,000. (Co-PI: Ayan Mukhopadhyay, Aniruddha Gokhale)
- 2020–2024 National Science Foundation. **SCC-IRG Track 1: Mobility for all - Harnessing Emerging Transit Solutions for Underserved Communities.** Award Amount: \$2,134,898. (Co-PI: Samitha Samarnayake (Cornell), Lillian Ratliff (UW), Aron Laszka (UH), Mina Sartipi (UTC))
- 2020–2024 Department of Energy. **AI-Engine for Optimizing Integrated Service Mixed Fleet Transit Operations.** Award Amount: \$1,877,535. (Co-PI: Philip Pugliese (CARTA), Aron Laszka (UH))
- 2020–2021 National Science Foundation. **Collaborative Research: RAPID: Addressing Transit Accessibility and Public Health Challenges due to COVID-19.** Award Amount: \$54,912. (Co-PI: Aron Laszka (UH))
- 2018–2021 Department of Energy. **High-dimensional Data-driven Energy optimization for Multi-Modal Transit Agencies (HD-EMMA).** Award Amount: \$1,000,000. (Co-PI: Philip Pugliese (CARTA), Aron Laszka (UH))
- 2019–2020 Cisco Systems Foundation. **Spatio-Temporal AI Inference Engines for System-Level Reliability.** Award Amount: \$100,000. (Co-PI: Aniruddha Gokhale)
- 2018–2021 National Science Foundation. **III: Small: Collaborative Research: Summarizing Heterogeneous Crowdsourced & Web Streams Using Uncertain Concept Graphs.** Award Amount: \$239,953. (Co-PI: Gautam Biswas (Vanderbilt))
- 2018–2021 National Science Foundation. **NeTS: JUNO2: Collaborative Research: STEAM: Secure and Trustworthy Framework for Integrated Energy and Mobility in Smart Connected Communities.** Award Amount: \$209,992.
- 2017–2019 Marriott International. **Internet of Things (IoT) Immersion.** Award Amount: \$29,999. (Co-PI: Aniruddha Gokhale)
- 2017–2019 Siemens. **Blockchain as Middleware Services for Transactive Energy Applications.** Award Amount: \$478,375.
- 2017–2018 MetaMorph. **MetaMorph Draper.** Award Amount: \$84,201.
- 2017–2018 MetaMorph. **CAD Extensions for OpenMETA.** Award Amount: \$88,127.
- 2016–2019 Siemens, Inc. **Industry Affiliate Program Grant.** Award Amount: \$450,000.
- 2016–2020 National Science Foundation. **USIgnite: Collaborative Research: Social Computing Platform for Multi-Modal Transit.** Award Amount: \$306,376.

- 2016–2019 U.S. Army. **Designing Resilient Data Processing Systems for Adversarial Environments.** Award Amount: \$367,161.
- 2016–2017 Siemens, Inc. **City-scale Extensible Smart Cyber-Physical Systems.** Award Amount: \$49,886.
- 2015–2017 National Science Foundation. **CPS-EAGER- Experiments with Smart City Hubs: Integration Platform for Human Cyber-Physical Systems In Smart Cities.** Award Amount: \$197,556. (Co-PI: Jules White, Sandeep Neema)
- 2014–2016 Siemens, Inc. **Building Resilient Distributed Systems for Next-Generation Mobile Ad-hoc Cyber-Physical Systems.** Award Amount: \$238,188.
- 2012–2013 The Office of Naval Research (ONR). **Domain Specific Languages for Designing Electrical Ships.** Award Amount: \$40,580. (Co-PI: Sherif Abdelwahed (MSU))
- 2010–2012 National Science Foundation. **Center for Autonomic Computing.** Award Amount: \$49,970. (Co-PI: Sherif Abdelwahed (MSU))

▬ **Grants as Co-PI (Total: \$ 27,663,653)**

- 2020–2023 Defense Advanced Research Projects Agency. **Model-based Intent-Driven Adaptive Software (MIDAS).** PI: Karsai, Gabor. Award Amount: \$3,176,697.
- 2020–2023 Department of Defense. **Integrated Microgrid Control Platform.** PI: Karsai, Gabor. Award Amount: \$933,392.
- 2019–2023 National Science Foundation. **Collaborative Research: An Interdisciplinary Approach to Prepare Undergraduates for Data Science Using Real-World Data from High-Frequency Monitoring Systems.** PI: Biswas, Gautam. Award Amount: \$631,435.
- 2018–2023 National Science Foundation. **FW-HTF Theme 1: Collaborative Research: Augmenting and Advancing Cognitive Performance of Control Room Operators for Power Grid Resiliency.** PI: Biswas, Gautam. Award Amount: \$323,081.
- 2018–2022 Defense Advanced Research Projects Agency. **Assurance-based Learning-enabled Cyber-Physical Systems (ALC).** PI: Karsai, Gabor. Award Amount: \$7,196,463.
- 2018–2020 Tennessee Department of Transportation. **Collaborative Research Project To Coordinate The Data From the Crash Predictive Analytics Program Between TDOT and TDOSHS.** PI: Baroud, Hiba. Award Amount: \$174,998.
- 2018–2019 General Dynamics Land systems. **GDLS-MBSE.** PI: Bapty, Ted. Award Amount: \$120,000.
- 2016–2020 Department of Energy. **Resilient Information Architecture Platform for the Smart Grid (RIAPS).** PI: Karsai, Gabor. Award Amount: \$3,998,459.
- 2016–2017 Air Force Office of Scientific Research. **SCOPE Laboratory: Experimental Testbed for Evaluating Secure Cyber Operations in Physical Environments.** PI: Gokhale, Aniruddha. Award Amount: \$95,400.

- 2014–2016 Defense Advanced Research Projects Agency. **Support for System of Systems Integration Technology and Experimentation (SoSITE)**. PI: Karsai, Gabor. Award Amount: \$96,146.
- 2013–2016 National Science Foundation. **CPS: Synergy: Collaborative Research: Diagnostics and Prognostics Using Temporal Causal Models for Cyber-Physical Systems- A case of Smart Electric Grid**. PI: Karsai, Gabor. Award Amount: \$399,951.
- 2012–2014 Air Force Research Laboratory. **Resilient Software Systems**. PI: Karsai, Gabor. Award Amount: \$699,570.
- 2012–2013 Department of Defense. **Future Airborne Capability Environment (FACE 5)**. PI: Bapty, Ted. Award Amount: \$3,573,021.
- 2011–2014 Defense Advanced Research Projects Agency. **DARPA - F6 Model-driven Development Kit (F6MDK)**. PI: Karsai, Gabor. Award Amount: \$6,245,040.

Students and Postdoc Scholars Advised

PhD Students Graduated

- 2020 Scott Eisele. [Resolving Challenges in Multi-Stakeholder CPS Using Distributed Ledgers](#) (Doctoral dissertation, Vanderbilt University).
- 2018 Fangzhou Sun. [Algorithms for Context-Sensitive Prediction, Optimization and Anomaly Detection in Urban Mobility](#) (Doctoral dissertation, Vanderbilt University) (Co-advised with Jules White).
- 2017 Pradhan, Subhav. [Algorithms and Techniques for Managing Extensibility in Cyber-Physical Systems](#) (Doctoral dissertation, Vanderbilt University) (Co-advised with Aniruddha Gokhale).

M.S. Students Graduated

- 2020 Matthew Buruss. [Enhancing the Robustness of Deep Neural Networks Against Security Threats Using Radial Basis Functions](#) (MS Thesis, Vanderbilt University).
- 2020 Sanchita Basak. [Spatiotemporal Anomaly Detection and Prediction of Anomaly Propagation Path Using LSTM Networks](#) (MS Thesis, Vanderbilt University).
- 2019 Chinmaya Samal. [Time-dependent and Privacy- Preserving Decentralized Routing using Federated Learning](#) (MS Thesis, Vanderbilt University).

Current PhD Students

- Geoffrey Pettet, CS PhD Program
- Michael Wilbur, CS PhD Program
- Nithin Guruswamy, CS PhD Program
- Shreyas Ramakrishnan, EE PhD Program

Dissertation Program Committee

- Afiya Ayman (University of Houston)
- Jian Li
- Ajay Chhokra
- Saqib Hasan, EE
- Anirban Bhattacharjee
- Yi Li
- Jian Lou
- Ayan Mukhopadhyay
- Amin Ghafouri
- Yao Pan
- Saideep Nannapaneni (Civil Engineering)

Postdoc Scholars and Research Scientists

- Sayyed Vazirizade
- Saideep Nannapaneni
- William Emfinger
- Ayan Mukhopadhyay

Undergraduate Researchers

- 2020,2021 Rongze Gui, CS - Transit Simulation Statistical Analysis and Visualization for Emergency Response Systems.
- 2020 Abhiram Vadali, CS - Big Data Analytics for Smart Transit Systems
- 2020 Riyan Kabir, CS - Big Data Analytics for Smart Transit Systems
- 2020 Hunter Wang, CS - Assured Autonomy
- 2020 Shriya Karam, CS - Big Data Analytics for Smart Transit Systems
- 2020 Teo Lee, CS - Predictive Models for Emergency Response Systems
- 2020 Anna Ouyang, Psychology - Predictive Models for Emergency Response Systems
- 2018, 2019 Matthew Buruss, CS - Assured Autonomy
- 2019,2020 Keegan Campanelli, EE - Transactive Energy and Electric Grid

- 2019 Li Haoyu, CS - Data Analytics for Emergency Response
- 2019 Brian Xu, CS - Data Analytics for Emergency Response
- 2017, 2018 Rounak Salim, CS - Indoor Localization
- 2017 Hoyos Juan Sebastian, CS - Secure Operating Systems
- 2017 Nicholas Lewis, CS - Internet of Things
- 2017 Aaron Smith, CS - Virtual Reality
- 2017 Anne Zou, CS - Mobility Application for Cities
- 2016-2017 Smart Home Analytics Team - Megan Woodruff, John Carlton Jester, Morgan Fogel, Jianpeng Min (Senior Design)

Publications

- † **Co-authors with a trailing † indicate graduate and undergraduate students advised.**
- ‡ **Co-authors with a trailing ‡ are postdocs and research scientists formally mentored.**

Citation metrics from Google Scholar. Total 3002 citations, h-index of 29, and i10-index of 72 as of Jan 1, 2022.

Journal Publications (41 articles)

- J1. Geoffrey Pettet[†], Ayan Mukhopadhyay[‡], Mykel J. Kochenderfer, and **Abhishek Dubey** (2021). "Hierarchical Planning for Dynamic Resource Allocation in Smart and Connected Communities". In: *ACM Trans. Cyber-Phys. Syst.*
 - *Summary:* This paper presents a hierarchical decision making framework for emergency response and resource allocations systems.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J2. Ayan Mukhopadhyay[‡], Geoffrey Pettet[†], Sayyed Mohsen Vazirizade[‡], Di Lu, Alejandro Jaimes, Said El Said, Hiba Baroud, Yevgeniy Vorobeychik, Mykel Kochenderfer, and **Abhishek Dubey** (2022). "A Review of Incident Prediction, Resource Allocation, and Dispatch Models for Emergency Management". In: *Accident Analysis & Prevention* 165, p. 106501. ISSN: 0001-4575
 - *Summary:* This is one of the first exhaustive reviews of decision theoretic prediction and optimization procedures used in emergency response domain.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J3. Shreyas Ramakrishna[†], Zahra RahimiNasab, Gabor Karsai, Arvind Easwaran, and **Abhishek Dubey** (2021). "Efficient Out-of-Distribution Detection Using Latent Space of β -VAE for Cyber-Physical Systems". In: *ACM Trans. Cyber-Phys. Syst.*
 - *Summary:* This paper describes a workflow, methodology and results for detecting abnormal conditions in autonomous driving systems. The key idea presented in the paper is that detection and explanation of the reasons behind the anomaly can be done using a single strategically trained variational autoencoder.

- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J4. Ricardo Sandoval, Caleb Van Geffen, Michael Wilbur[†], Brandon Hall, **Abhishek Dubey**, William Barbour, and Daniel B. Work (2021). “Data driven methods for effective micro-mobility parking”. In: *Transportation Research Interdisciplinary Perspectives*.
- *Summary:* This paper describes algorithms to determine optimal depots to park and store scooters in Nashville, TN instead of dropping them on side-streets in an adhoc manner.
 - *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J5. Bradley Potteiger, **Abhishek Dubey**, Feiyang Cai, Zhenkai Zhang, and Xenofon Koutsoukos (2021). “Moving Target Defense for the Security and Resilience of Mixed Time and Event Triggered Cyber-Physical Systems”. In: *Journal of Systems Architecture*
- *Summary:* This paper describes the design of a moving target defence algorithm using an operating system kernel that supports spatial and temporal separation.
 - *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J6. Yuche Chen, Guoyuan Wu, Ruixiao Sun[†], **Abhishek Dubey**, Aron Laszka, and Philip Pugliese (2021). “A Review and Outlook of Energy Consumption Estimation Models for Electric Vehicles”. In: *Society of Automotive Engineers (SAE) International Journal of Sustainable Transportation, Energy, Environment, & Policy*
- *Summary:* This paper describes the state of the art on energy consumption models for electric vehicles.
 - *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J7. Sanchita Basak[†], Saptarshi Sengupta, Shi-Jie Wen, and **Abhishek Dubey** (2021). “Spatio-temporal AI inference engine for estimating hard disk reliability”. In: *Pervasive and Mobile Computing* 70, p. 101283. ISSN: 1574-1192.
- *Summary:* This paper describes a anomaly detection method for unstructured time series data of hard disk performance parameters. This is an extension of a conference paper.
 - *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J8. Hao Tu, Yuhua Du, Hui Yu, **Abhishek Dubey**, Srdjan Lukic, and Gabor Karsai (2020). “Resilient Information Architecture Platform for the Smart Grid: A Novel Open-Source Platform for Microgrid Control”. In: *IEEE Transactions on Industrial Electronics* 67.11, pp. 9393–9404.
- *Summary:* This paper describes the design and components of the [Resilient Information Architecture Platform for Smart Grid](#) and describes the implementation of distributed microgrid control algorithms on the middleware.
 - *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J9. Scott Eisele[†], Carlos Barreto, **Abhishek Dubey**, Xenofon Koutsoukos, Taha Eghtesad, Aron Laszka, and Anastasia Mavridou (2020). “Blockchains for Transactive Energy Systems: Opportunities, Challenges, and Approaches”. In: *IEEE Computer* 53.9, pp. 66–76
- *Summary:* This paper describes the reasons of the interest in use of blockchains for transactive energy systems. The paper also focuses on challenges such as verification and security of the blockchain-based transactive systems.

- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J10. Scott Eisele[†], Aron Laszka, Doug Schmidt, and **Abhishek Dubey** (2020). “[The Role of Blockchains in Multi-Stakeholder Transactive Energy Systems](#)”. In: *Frontiers in Blockchain* 3, p. 55. ISSN: 2624-7852
- *Summary:* This paper describes the decentralized protocols of TRANSAX, our transactive energy middleware.
 - *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J11. Afiya Ayman, Amutheezan Sivagnanam, Michael Wilbur[†], Philip Pugliese, **Abhishek Dubey**, and Aron Laszka (2020). “[Data-Driven Prediction and Optimization of Energy Use for Transit Fleets of Electric and ICE Vehicles](#)”. In: *ACM Transactions on Internet of Things*
- *Summary:* This paper describes the design, deployment and challenges faced while building macro energy prediction models for mixed transit fleet of Chattanooga, TN.
 - *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J12. J. P. V. Talusan, Michael Wilbur[†], **Abhishek Dubey**, and Keichi Yasumoto (2020). “[Route Planning Through Distributed Computing by Road Side Units](#)”. In: *IEEE Access* 8, pp. 176134–176148
- *Summary:* This paper describes algorithms for decentralized route planning in cities. The goal is to reduce the reliance on centralized cloud services which may become unavailable during disasters.
 - *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J13. Yuche Chen, Guoyuan Wu, Ruixiao S, **Abhishek Dubey**, Aron Laszka, and Philip Pugliese (2020). “[A Review and Outlook of Energy Consumption Estimation Models for Electric Vehicles](#)”. In: *Renewable and Sustainable Energy Reviews*
- *Summary:* The paper presents a review of current state of the art in energy estimation models for transit fleet, especially electric vehicles.
 - *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J14. Scott Eisele[†], Taha Eghtesad, Keegan Campanelli[†], Prakhar[⊙] Agrawal, Aron Laszka, and **Abhishek Dubey** (Jan. 2021). “[Safe and Private Forward-Trading Platform for Transactive Microgrids](#)”. In: *ACM Transactions of Cyber-Physical Systems* 5.1. ISSN: 2378-962X
- *Summary:* This paper presented the privacy and safety trade-off challenge we faced while designing the transactive energy systems using TRANSAX.
 - *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J15. Purboday Ghosh, Scott Eisele[†], **Abhishek Dubey**, Mary Metelko, Istvan Madari, Peter Volgyesi, and Gabor Karsai (2020). “[Designing a decentralized fault-tolerant software framework for smart grids and its applications](#)”. In: *Journal of Systems Architecture* 109, p. 101759. ISSN: 1383-7621
- *Summary:* This paper describes the fault management architecture of the Resilient Information Architecture Platform for Smart Grid.
 - *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.

- J16. Saideep Nannapaneni, Sankaran Mahadevan, **Abhishek Dubey**, and Yung-Tsun Tina Lee (2020). “[Online monitoring and control of a cyber-physical manufacturing process under uncertainty](#)”. In: *Journal of Intelligent Manufacturing*, pp. 1–16
- *Summary*: This paper develops a dynamic Bayesian network approach, which enables the aggregation of multiple uncertainty sources, parameter estimation and robust prediction for online control.
 - *Contributions*: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J17. Shreyas Ramakrishna[†], Charles Hartsell*, Matthew P. Burruss[†], Gabor Karsai, and **Abhishek Dubey** (2020). “[Dynamic-weighted simplex strategy for learning enabled cyber physical systems](#)”. In: *Journal of Systems Architecture* 111, p. 101760. ISSN: 1383-7621
- *Summary*: This paper describes the design of **Deep NN Car** and describes an online simplex strategy for adaptive augmentation of a preexisting AI based driving algorithms in the vehicles.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J18. Saqib Hasan[†], **Abhishek Dubey**, Gabor Karsai, and Xenofon Koutsoukos (2020). “[A game-theoretic approach for power systems defense against dynamic cyber-attacks](#)”. In: *International Journal of Electrical Power & Energy Systems* 115. ISSN: 0142-0615
- *Summary*: This paper describes a game theoretic dynamic strategy for prioritizing the resources that should be protected during dynamic attacks on substation networks.
 - *Contributions*: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J19. Ruixiao S, Yuche Chen, **Abhishek Dubey**, and Philip Pugliese (2021). “[Hybrid electric buses fuel consumption prediction based on real-world driving data](#)”. In: *Transportation Research Part D: Transport and Environment* 91, p. 102637. ISSN: 1361-9209
- *Summary*: This paper described the microscopic energy prediction models for hybrid-electric buses based on the data from the DOE VTO grant with Chattanooga. My role in the project was PI.
 - *Contributions*: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J20. Shashank Shekhar, Ajay Chhokra[†], Hongyang S, Aniruddha Gokhale, **Abhishek Dubey**, Xenofon Koutsoukos, and Gabor Karsai (2020). “[URMILA: Dynamically Trading-off Fog and Edge Resources for Performance and Mobility-Aware IoT Services](#)”. In: *Journal of Systems Architecture*. ISSN: 1383-7621
- *Summary*: This paper describes dynamic optimization of fog computing services.
 - *Contributions*: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J21. Fangzhou Sun[†], **Abhishek Dubey**, Jules White, and Aniruddha Gokhale (Jan. 2019). “[Transit-hub: a smart public transportation decision support system with multi-timescale analytical services](#)”. In: *Cluster Computing* 22.Suppl 1, pp. 2239–2254
- *Summary*: This paper describes the Transit Hub system my team developed for Nashville, TN as part of the global cities team challenge in 2016.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J22. Ria Mae Borromeo, Lei Chen, **Abhishek Dubey**, Sudeepa Roy, and Saravanan Thirumuganathan (2019). “[On Benchmarking for Crowdsourcing and Future of Work Platforms](#)”. In: *IEEE Data Eng. Bull.* 42.4, pp. 46–54

- *Summary:* This paper describes the discussions from the benchmark problems from the Shonan meeting on future of work in 2019.
 - *Contributions:* 5%. Participated in paper discussion.
- J23. **Abhishek Dubey**, W. Emfinger, A. Gokhale, P. Kumar, D. McDermet, T. Bapty, and G. Karsai (July 2019). “[Enabling Strong Isolation for Distributed Real-Time Applications in Edge Computing Scenarios](#)”. In: *IEEE Aerospace and Electronic Systems Magazine* 34.7, pp. 32–45. ISSN: 1557-959X
- *Summary:* The paper describes the design and implementation of a FACE conformant operating system kernel that provides both POSIX as well as ARINC653 APIs and support health management.
 - *Contributions:* 90 %. *Developed the concept and wrote the manuscript.*
- J24. **Abhishek Dubey**, Gabor Karsai, Peter Volgyesi, Mary Metelko, Istvan Madari, Hao Tu, Yuhua Du, and Srdjan Lukic (2019). “[Device Access Abstractions for Resilient Information Architecture Platform for Smart Grid](#)”. In: *Embedded Systems Letters* 11.2, pp. 34–37
- *Summary:* The paper describes the design of device actors, an abstraction to integrate heterogeneous external devices into distributed power system applications built over the RIAPS platform.
 - *Contributions:* 90 %. *Developed the concept and wrote the manuscript.*
- J25. Ajay Chhokra†, **Abhishek Dubey**, Nagabhushan Mahadevan, Gabor Karsai, Daniel Balasubramanian, and Saqib Hasan† (Feb. 2018). “[Hierarchical Reasoning about Faults in Cyber-Physical Energy Systems using Temporal Causal Diagrams](#)”. In: *International Journal of Prognostics and Health Management* 9.1
- *Summary:* This paper describes the design and operations of a new formalism for studying and analyzing temporal fault propagation in power system networks.
 - *Contributions:* 25 %. *Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- J26. Marisol Garcia Valls, **Abhishek Dubey**, and Vicent J. Botti (2018). “[Introducing the new paradigm of Social Dispersed Computing: Applications, Technologies and Challenges](#)”. In: *Journal of Systems Architecture - Embedded Systems Design* 91, pp. 83–102
- *Summary:* The paper explores the emerging concepts of computing and how they are beneficial to social cyber-physical system applications. A key contribution of the paper is to present a consensus definition of various emerging distributed system concepts and identify the research challenges.
 - *Contributions:* 50 %. *Jointly developed the idea with Marisol and co-wrote the paper.*
- J27. Subhav Pradhan†, **Abhishek Dubey**, Shweta Khare, Saideep Nannapaneni, Aniruddha S. Gokhale, Sankaran Mahadevan, Douglas C. Schmidt, and Martin Lehofer (2018). “[CHAR-IOT: Goal-Driven Orchestration Middleware for Resilient IoT Systems](#)”. In: *Transactions of Cyber Physical Systems* 2.3, 16:1–16:37
- *Summary:* This paper describes the algorithm, design, and architecture of an online re-configuration planner that can ensure that cyber-physical systems can recover from failures without a prescribed sequence of recovery actions.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- J28. Saideep Nannapaneni, S. Mahadevan, **Abhishek Dubey**, D. Lechevalier, A. Narayanan, and S. Rachuri (2017). “[Automated Uncertainty Quantification Through Information Fusion in Manufacturing Processes](#)”. eng. In: *Smart and Sustainable Manufacturing Systems* 1.1, pp. 153–177. ISSN: 25206478

- *Summary:* This paper describes a Bayesian network based uncertainty quantification approach for manufacturing CPS.
 - *Contributions:* 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- J29. Subhav Pradhan[†], **Abhishek Dubey**, Tihamer Levendovszky, Pranav Srinivas Kumar, William Emfinger, Daniel Balasubramanian, William Otte, and Gabor Karsai (2016). “Achieving resilience in distributed software systems via self-reconfiguration”. In: *Journal of Systems and Software* 122, pp. 344–363
- *Summary:* This paper describes the key mappings and encoding of the resilient recovery problem of systems using Z3, a Satisfiability Modulo Theory solver.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J30. Gonçalo Martins, Arul Moondra, **Abhishek Dubey**, Anirban Bhattacharjee, and Xenofon D. Koutsoukos (2016). “Computation and Communication Evaluation of an Authentication Mechanism for Time-Triggered Networked Control Systems”. In: *Sensors* 16.8, p. 1166.
- *Summary:* This paper studied the overhead of authentication based security mechanisms on time triggered networks.
 - *Contributions:* 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J31. Gautam Biswas, Hamed Khorasgani, Gerald Stanje, **Abhishek Dubey**, Somnath Deb, and Sudipto Ghoshal (2016b). “An approach to mode and anomaly detection with spacecraft telemetry data”. In: *International Journal of Prognostics and Health Management*.
- *Summary:* This paper described a semi-supervised approach to anomaly detection from streaming data collected from spacecraft. The same approach applies to telemetry data received from the projects we are doing with the transit and emergency response departments.
 - *Contributions:* 10%. Participated in paper discussions and wrote/edited a minor portion of the paper.
- J32. Saideep Nannapaneni, **Abhishek Dubey**, Sherif Abdelwahed, Sankaran Mahadevan, Sandeep Neema, and Ted Bapty (2016). “Mission-based reliability prediction in component-based systems”. In: *International Journal of Prognostics and Health Management* 7.001
- *Summary:* This paper extended the recovery planning algorithms to choose a recovery configuration that is less likely to fail over the time of the mission. The key idea was to generate reliability block diagrams from system configurations considering both software and hardware failures and then use the estimated reliability information to select the recovery configuration.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J33. Daniel Balasubramanian, **Abhishek Dubey**, William Otte, Tihamer Levendovszky, Anirudha S. Gokhale, Pranav Srinivas Kumar, William Emfinger, and Gabor Karsai (2015). “DREMS ML: A wide spectrum architecture design language for distributed computing platforms”. In: *Sci. Comput. Program.* 106, pp. 3–29
- *Summary:* This paper describes the modeling language that combines the best aspects of textual and graphical environments to enable design and analysis of applications for fractionated satellite platforms that were part of the DARPA F6 program.
 - *Contributions:* 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.

- J34. Nagabhushan Mahadevan, **Abhishek Dubey**, Ajay Chhokra†, Huangcheng Guo, and Gabor Karsai (2015). “Using temporal causal models to isolate failures in power system protection devices”. In: *IEEE Instrum. Meas. Mag.* 18.4, pp. 28–39
- *Summary:* This paper describe the temporal causal model formulation that is an extension of temporal failure propagation graphs and focuses on diagnosing systems with fault protection devices that can fail themselves.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J35. Tihamer Levendovszky, **Abhishek Dubey**, William Otte, Daniel Balasubramanian, Alessandro Coglio, Sandor Nyako, William Emfinger, Pranav Srinivas Kumar, Aniruddha S. Gokhale, and Gabor Karsai (2014). “Distributed Real-Time Managed Systems: A Model-Driven Distributed Secure Information Architecture Platform for Managed Embedded Systems”. In: *IEEE Software* 31.2, pp. 62–69
- *Summary:* This paper describes the key challenges and the mechanisms to mitigate those challenges for multi stakeholder distributed real-time systems.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J36. Nagabhushan Mahadevan, **Abhishek Dubey**, Daniel Balasubramanian, and Gabor Karsai (2013). “Deliberative, search-based mitigation strategies for model-based software health management”. In: *ISSE* 9.4, pp. 293–318
- *Summary:* This paper described deliberation strategies for finding the optimal mitigation action for recovering real-time systems from failures. This paper was part of our effort on developing health management techniques for software-intensive systems.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J37. Subhav Pradhan†, William Otte, **Abhishek Dubey**, Aniruddha S. Gokhale, and Gabor Karsai (2013). “Towards a resilient deployment and configuration infrastructure for fractionated spacecraft”. In: *SIGBED Review* 10.4, pp. 29–32
- *Summary:* This paper provided an early overview of the System F6 software architecture that included a separation kernel, multi-level security information architecture, and a remote deployment engine that can manage the application state remotely and securely.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J38. **Abhishek Dubey**, Gabor Karsai, and Nagabhushan Mahadevan (2011). “A component model for hard real-time systems: CCM with ARINC-653”. In: *Softw., Pract. Exper.* 41.12, pp. 1517–1550
- *Summary:* This paper described one of the first implementations of an ARINC-653 layer for Linux. It also described the formulation of a component model for building distributed applications upon that operating system. This architecture was leveraged heavily in designing the future airborne capability environment (FACE).
 - *Contributions:* 90 %. Developed the concept and wrote the manuscript.
- J39. Steven Nordstrom, **Abhishek Dubey**, Turker Keskinpala, Sandeep Neema, and Theodore Bapty (2011). “Autonomic Healing of Model-Based Systems”. In: *JACIC* 8.4, pp. 87–99
- *Summary:* This paper described a policy for prescriptive system recovery mechanism for high performance computing clusters.
 - *Contributions:* 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.

- J40. Luciano Piccoli, **Abhishek Dubey**, James N Simone, and James B Kowalkowski (Apr. 2010). “LQCD workflow execution framework: Models, provenance and fault-tolerance”. In: *Journal of Physics: Conference Series* 219.7, p. 072047
- *Summary:* This paper described the workflow engine used for Lattice Quantum Chromodynamics experiments at FERMI Lab.
 - *Contributions:* 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- J41. **Abhishek Dubey**, Rajat Mehrotra, Sherif Abdelwahed, and Asser N. Tantawi (2009). “Performance modeling of distributed multi-tier enterprise systems”. In: *SIGMETRICS Performance Evaluation Review* 37.2, pp. 9–11
- *Summary:* This paper described the formalization of a queuing theoretic multi-tier model of cloud systems. This paper was later leveraged for the work on power management of computing clusters and autoscaling of cloud applications. The latter paper has been cited more than 600 times since it was published in 2011.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- J42. **Abhishek Dubey**, Steven Nordstrom, Turker Keskinpala, Sandeep Neema, Ted Bapty, and Gabor Karsai (2007). “Towards a verifiable real-time, autonomic, fault mitigation framework for large scale real-time systems”. In: *ISSE* 3.1, pp. 33–52
- *Summary:* This paper described the real-time reflex engine and established parameters under which it will perform as expected and can scale to manage faults in large systems.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

Highly Selective Conference Publications (Refereed) (28 articles)

(Acceptance Rate \leq 34%).

- HC1. Yasas Senarath, Ayan Mukhopadhyay[‡], Sayyed Vazirizade[‡], hemant Purohit, Saideep Nanapaneni, and **Abhishek Dubey** (2021). “Practitioner-Centric Approach for Early Incident Detection Using Crowdsourced Data for Emergency Services”. In: *21st IEEE International Conference on Data Mining (ICDM 2021)*
- *Summary:* This paper describes an optimization framework for estimating the location of emergency incidents given uncertain crowd-sourced reports
 - *Contributions:* 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [**Acceptance Rate: 20 %.**]
- HC2. Geoffrey Pettet[†], Ayan Mukhopadhyay[‡], Mykel Kochenderfer, and **Abhishek Dubey** (2021). “Hierarchical Planning for Resource Allocation in Emergency Response Systems”. In: *Proceedings of the 12th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2021, Nashville, TN, USA*
- *Summary:* This paper describes an efficient strategy for dynamically allocating the first responders across a city by leveraging hierarchy and allowing frequent re-balancing between the areas. The work was validated with real-world data from the Nashville TN fire department.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate: 26 %.**]
- HC3. Michael Wilbur[†], Ayan Mukhopadhyay[‡], Sayyed Vazirizade[‡], Philip Pugliese, Aron Laszka, and **Abhishek Dubey** (2021). “Energy and Emission Prediction for Mixed-Vehicle Transit Fleets Using Multi-Task and Inductive Transfer Learning”. In: *The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD)*

- *Summary:* This paper describes the multi-task and transfer learning formulations for the energy prediction models.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 29 %.]*
- HC4. Amutheezan Sivagnanam, Afiya Ayman, Michael Wilbur[†], Philip Pugliese, **Abhishek Dubey**, and Aron Laszka (2021). “[Minimizing Energy Use of Mixed-Fleet Public Transit for Fixed-Route Service](#)”. In: *Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI-21)*
- *Summary:* This paper was part of our DOE project with Chattanooga Transit Agency. In the paper, we described a set of algorithms and heuristics to solve the complex problem of the vehicle to trip assignment considering expected energy usage (estimated using predictive models developed separately) and availability of chargers. One of the key innovations of this work is the ability to manage a mixed transit fleet that has diesel, hybrid, and electric vehicles.
 - *Contributions:* 25 %. *Collaboratively developed the research ideas and wrote/edited a portion of the paper. [Acceptance Rate: 21 %.]*
- HC5. Samriddhi Singla, Ayan Mukhopadhyay[‡], Michael Wilbur[†], Tina Diao, Vinayak Gajjewar, Ahmed Eldawy, Mykel Kochenderfer, Ross Shachter, and **Abhishek Dubey** (2021). “WildfireDB: An Open-Source Dataset Connecting Wildfire Spread with Relevant Determinants”. In: *35th Conference on Neural Information Processing Systems (NeurIPS 2021) Track on Datasets and Benchmarks*
- *Summary:* This paper describes first of its kind open-source curated dataset providing information on wildfire occurrence
 - *Contributions:* 10%. *Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [Acceptance Rate: 26 %.]*
- HC6. Sayyed Mohsen Vazirizade[‡], Ayan Mukhopadhyay[‡], Geoffrey Pette[†], Said El Said, Hiba Baroud, and **Abhishek Dubey** (2021). “[Learning Incident Prediction Models Over Large Geographical Areas for Emergency Response](#)”. In: *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 424–429
- *Summary:* This paper describes the design of an incident likelihood prediction framework for the state of TN.
 - *Contributions:* 10%. *Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [Acceptance Rate: 30 %.]*
- HC7. Ruixiao Sun[†], Rongze Gui, Himanshu Neema, Yuche Chen, Juliette Ugirumurera, Joseph Severino, Philip Pugliese, Aron Laszka, and **Abhishek Dubey** (2021). “[TRANSIT-GYM: A Simulation and Evaluation Engine for Analysis of Bus Transit Systems](#)”. In: *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 69–76
- *Summary:* This paper describes the an open source simulation framework for transit operators.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 30 %.]*
- HC8. Matthew Burruss[†], Shreyas Ramakrishna[‡], and **Abhishek Dubey** (2021). “[Deep-RBF Networks for Anomaly Detection in Automotive Cyber-Physical Systems](#)”. In: *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 55–60
- *Summary:* This paper describes the design of anomaly detection framework using deep RBF networks.
 - *Contributions:* 10%. *Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [Acceptance Rate: 30 %.]*

- HC9. Francis Tiausas, Jose Paolo Talusan, Yu Ishimaki, Hayato Yamana, Hirozumi Yamaguchi, Shameek Bhattacharjee, **Abhishek Dubey**, Keiichi Yasumoto, and Sajal K. Das (2021). “User-centric Distributed Route Planning in Smart Cities based on Multi-objective Optimization”. In: *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 77–82
- *Summary:* This paper describes a decentralized routing algorithm for transportation networks.
 - *Contributions:* 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [**Acceptance Rate:** 30 %.]
- HC10. Charles Hartsell*, Shreyas Ramakrishna†, **Abhishek Dubey**, Daniel Stojcsics, Nag Mahadevan, and Gabor Karsai (2021). “ReSonAte: A Runtime Risk Assessment Framework for Autonomous Systems”. In: *16th International Symposium on Software Engineering for Adaptive and Self-Managing Systems, SEAMS 2021*
- *Summary:* This paper describes a dynamic assurance framework for computing the risk of different hazards in CPS with AI components considering the designed in assurance and mitigation mechanisms.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate:** 30 %.]
- HC11. Scott Eisele†, Taha Egthesad, Nicholas Troutman, Aron Laszka, and **Abhishek Dubey** (2020). “Mechanisms for Outsourcing Computation via a Decentralized Market”. In: *14TH ACM International Conference on Distributed and Event Based Systems*
- *Summary:* This paper described the design of an edge computing platform that can provide a market for exchanging and bidding for spot computation resources. The work established key parameter settings and protocols that can reduce the likelihood of cheating by participants.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate:** 30 %.]
- HC12. Geoffrey Pettet†, Ayan Mukhopadhyay‡, Mykel Kochenderfer, Yevgeniy Vorobeychik, and **Abhishek Dubey** (2020). “On Algorithmic Decision Procedures in Emergency Response Systems in Smart and Connected Communities”. In: *Proceedings of the 19th Conference on Autonomous Agents and MultiAgent Systems, AAMAS 2020, Auckland, New Zealand*
- *Summary:* The paper described a decentralized emergency response protocol that can optimize the strategic allocation of vehicles considering future incident likelihood. The advantage of the decentralized method is that it can respond resiliently to communication failures and bottlenecks. The key innovation in this paper was the use of decentralized Monte Carlo tree search methods.
 - *Contributions:* 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate:** 23 %.]
- HC13. Yasas Senarath, Saideep Nannapaneni, Hemant Purohit, and **Abhishek Dubey** (Nov. 2020). “Emergency Incident Detection from Crowdsourced Waze Data using Bayesian Information Fusion”. In: *The 2020 IEEE/WIC/ACM International Joint Conference On Web Intelligence And Intelligent Agent Technology*. arXiv: 2011.05440. IEEE
- *Contributions:* 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
 - *Summary:* This paper describes an approach for early detection of motor vehicle incidents using Waze reports. The approach is important for reducing the response time. The key challenge is inaccuracy of the Waze reports both in spatial as well as temporal dimensions. [**Acceptance Rate:** 25 %.]

- HC14. Afiya Ayman, Michael Wilbur[†], Amutheezan Sivagnanam, Philip Pugliese, **Abhishek Dubey**, and Aron Laszka (June 2020). “[Data-Driven Prediction of Route-Level Energy Use for Mixed-Vehicle Transit Fleets](#)”. In: *2020 IEEE International Conference on Smart Computing (SMARTCOMP) (SMARTCOMP 2020)*. Bologna, Italy
- *Summary*: This paper describes the design of the macroscopic energy estimation models and the data processing steps performed for the transit fleet of Chattanooga, TN.
 - *Contributions*: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper. [**Acceptance Rate**: 32 %.]
- HC15. Sanchita Basak[†], Saptarshi Sengupta, and **Abhishek Dubey** (June 2019). “[Mechanisms for Integrated Feature Normalization and Remaining Useful Life Estimation Using LSTMs Applied to Hard-Disks](#)”. In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA*, pp. 208–216 [**Best Paper Award**]
- *Summary*: This was the first paper describing the LSTM models for estimating failures and predicting remaining useful life of hard disks.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate**: 29 %.]
- HC16. Michael Wilbur[†], **Abhishek Dubey**, Bruno Leão, and Shameek Bhattacharjee (June 2019). “[A Decentralized Approach for Real Time Anomaly Detection in Transportation Networks](#)”. In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA*, pp. 274–282
- *Summary*: This paper described an innovative fast online procedure for detecting anomalies in traffic probe data collected for the cities.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate**: 29 %.]
- HC17. Chinmaya Samal[†], **Abhishek Dubey**, and Lillian J. Ratliff (June 2019). “[Mobilytics-Gym: A Simulation Framework for Analyzing Urban Mobility Decision Strategies](#)”. In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA*, pp. 283–291
- *Summary*: This paper described an extension of MATSIM for setting up transportation simulations considering the incentives and discrete choice models for the community members.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate**: 29 %.]
- HC18. Ayan Mukhopadhyay[†], Geoffrey Pettet[†], Chinmaya Samal[†], **Abhishek Dubey**, and Yevgeniy Vorobeychik (2019). “[An online decision-theoretic pipeline for responder dispatch](#)”. In: *Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2019, Montreal, QC, Canada*, pp. 185–196
- *Summary*: This was a co-joint first author effort from Ayan and Geoff and demonstrated the first online MCTS based dispatch pipelines for managing emergency response in the cities.
 - *Contributions*: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [**Acceptance Rate**: 23 %.]
- HC19. Anastasia Mavridou, Aron Laszka, Emmanouela Stachtari, and **Abhishek Dubey** (2019). “[VeriSolid: Correct-by-Design Smart Contracts for Ethereum](#)”. In: *Financial Cryptography and Data Security - 23rd International Conference, FC 2019, Frigate Bay, St. Kitts and Nevis, Revised Selected Papers*, pp. 446–465
- *Summary*: This paper described a framework and method to design smart contracts that are correct by design.

- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper. [Acceptance Rate: 21.9 %.]*
- HC20. Scott Eisele[†], Aron Laszka, Anastasia Mavridou, and **Abhishek Dubey** (2018). “[SolidWorx: A Resilient and Trustworthy Transactive Platform for Smart and Connected Communities](#)”. In: *IEEE Conference on Internet of Things and Blockchains*, pp. 1263–1272
- *Summary:* This paper described the generalization of the transactive energy middleware and how it can be used for managing other resource allocation problems in the cities.
 - *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 15.3 %.]*
- HC21. Ayan Mukhopadhyay[‡], Yevgeniy Vorobeychik, **Abhishek Dubey**, and Gautam Biswas (2017). “[Prioritized Allocation of Emergency Responders based on a Continuous-Time Incident Prediction Model](#)”. In: *Proceedings of the 16th Conference on Autonomous Agents and MultiAgent Systems, AAMAS 2017, São Paulo, Brazil, May 8-12, 2017*, pp. 168–177
- *Summary:* This paper described a theoretical model for incident prediction and dispatch. This work was improved in subsequent ICCPS and AAMAS papers to use online Monte Carlo Tree Search for scalability.
 - *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper. [Acceptance Rate: 27 %.]*
- HC22. Aron Laszka, **Abhishek Dubey**, Michael Walker, and Douglas C. Schmidt (2017). “[Providing privacy, safety, and security in IoT-based transactive energy systems using distributed ledgers](#)”. In: *Proceedings of the Seventh International Conference on the Internet of Things, IOT 2017, Linz, Austria, October 22-25, 2017*, 13:1–13:8
- *Summary:* This is a highly cited paper and established the theoretical protocols and analysis for designing transactive energy systems.
 - *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper. [Acceptance Rate: 31 %.]*
- HC23. Geoffrey Pettet[†], Saideep Nannapaneni, Benjamin Stadnick, **Abhishek Dubey**, and Gautam Biswas (2017). “[Incident analysis and prediction using clustering and Bayesian network](#)”. In: *2017 IEEE SmartWorld*, pp. 1–8
- *Summary:* This was one of the first papers from our team on incident analysis and prediction and used clustering and Bayesian methods followed by survival regression.
 - *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 28 %.]*
- HC24. Akshay Dabholkar, **Abhishek Dubey**, Aniruddha S. Gokhale, Gabor Karsai, and Nagabhushan Mahadevan (2012). “[Reliable Distributed Real-Time and Embedded Systems through Safe Middleware Adaptation](#)”. In: *IEEE 31st Symposium on Reliable Distributed Systems, SRDS 2012, Irvine, CA, USA, October 8-11, 2012*, pp. 362–371
- *Summary:* This paper described runtime adaption on ARINC-653 operating systems. The work was performed using the ARINC-653 emulator that I wrote earlier in the NASA software health management project.
 - *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 25 %.]*
- HC25. Nagabhushan Mahadevan, **Abhishek Dubey**, and Gabor Karsai (2011). “[Application of software health management techniques](#)”. In: *2011 ICSE Symposium on Software Engineering for Adaptive and Self-Managing Systems, SEAMS 2011, Waikiki, Honolulu, HI, USA, May 23-24, 2011*, pp. 1–10

- *Summary:* This paper described the application of software health management that includes detection, diagnosis and recovery to the case study of Malaysian Air flight 124 over Perth, Australia in 2005. Our approach showed how the incident could have been avoided.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper.* [**Acceptance Rate: 27 %.**]
- HC26. Nilabja Roy, **Abhishek Dubey**, and Aniruddha S. Gokhale (2011). “Efficient Autoscaling in the Cloud Using Predictive Models for Workload Forecasting”. In: *IEEE International Conference on Cloud Computing, CLOUD 2011, Washington, DC, USA, 4-9 July, 2011*, pp. 500–507
- *Summary:* This paper has been cited more than 600 times and was one of the earlier papers to conceptualize and describe algorithms for autoscaling.
 - *Contributions:* 25 %. *Collaboratively developed the research ideas and wrote/edited a portion of the paper.* [**Acceptance Rate: 34 %.**]
- HC27. Rajat Mehrotra, **Abhishek Dubey**, Sherif Abdelwahed, and Krisa W. Rowland (2012). “RFDMon: A Real-time and Fault-tolerant Distributed System Monitoring Approach”. In: *The 8th International Conference on Autonomic and Autonomous Systems ICAS 2012*
- *Summary:* This paper described a real-time publish subscribe based performance monitoring middleware for large computing clusters.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper.* [**Acceptance Rate: 23 %.**]
- HC28. **Abhishek Dubey**, Nagabhushan Mahadevan, and Gabor Karsai (2012). “A deliberative reasoner for model-based software health management”. In: *The Eighth International Conference on Autonomic and Autonomous Systems*, pp. 86–92 [Best paper award]
- *Summary:* This was the first paper where we introduced the Satisfiability Modulo Theory based reconfiguration of software assemblies in real-time systems to recover from failures.
 - *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper.* [**Acceptance Rate: 23 %.**]

Selective Conference Publications (Refereed) (77 articles)

- Ajay Chhokra[†], Nagabhushan Mahadevan, **Abhishek Dubey**, and Gabor Karsa (2020).
- C1. “Qualitative fault modeling in safety critical Cyber Physical Systems”. In: *12th System Analysis and Modelling Conference*
- *Contributions:* 25 %. *Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- C2. Michael Wilbur[†], Chinmaya Samal[†], Jose Paolo Talusan, Keiichi Yasumoto, and **Abhishek Dubey** (2020). “Time-dependent Decentralized Routing using Federated Learning”. In: *2020 IEEE 23rd International Symposium on Real-Time Distributed Computing (ISORC)*
- *Contributions:* 40 %. *Devised and directed the main research ideas and wrote/edited a significant portion of the paper.* [**Acceptance Rate: 44 %.**]
- C3. B. Potteiger, F. Cai, A. **Dubey**, X. Koutsoukos, and Z. Zhang (2020). “Security in Mixed Time and Event Triggered Cyber-Physical Systems using Moving Target Defense”. In: *2020 IEEE 23rd International Symposium on Real-Time Distributed Computing (ISORC)*, pp. 89–97
- *Contributions:* 25 %. *Collaboratively developed the research ideas and wrote/edited a portion of the paper.* [**Acceptance Rate: 44 %.**] [**Best Paper Award Nominee**]

- C4. Geoffrey Pette[†], Malini Ghosal, Shant Mahserejian, Sarah Davis, Siddharth Sridhar, **Abhishek Dubey**, and Michael Meyer (2020). “A Decision Support Framework for Grid-Aware Electric Bus Charge Scheduling”. In: *2020 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)*. IEEE
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C5. Carlos Barreto, Taha Eghtesad, Scott Eisele[†], Aron Laszka, **Abhishek Dubey**, and Xenofon Koutsoukos (2020). “Cyber-Attacks and Mitigation in Blockchain Based Transactive Energy Systems”. In: *3rd IEEE International Conference on Industrial Cyber-Physical Systems (ICPS 2020)*
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C6. Jose Paolo Talusan, Michael Wilbur[†], **Abhishek Dubey**, and Keiichi Yasumoto (2020). “On Decentralized Route Planning Using the Road Side Units as Computing Resources”. In: *2020 IEEE International Conference on Fog Computing (ICFC)*. IEEE
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C7. Anirban Bhattacharjee, Ajay Dev Chhokra[†], Hongyang Sun[†], Shashank Shekhar, Aniruddha Gokhale, Gabor Karsai, and **Abhishek Dubey** (May 2020). “Deep-Edge: An Efficient Framework for Deep Learning Model Update on Heterogeneous Edge”. In: *2020 IEEE 4th International Conference on Fog and Edge Computing (ICFEC)*. IEEE. ISBN: 9781728173054
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C8. Ajay Chhokra[†], Saqib Hasan[†], **Abhishek Dubey**, and Gabor Karsai (2020). “A Binary Decision Diagram Based Cascade Prognostics Scheme For Power Systems”. In: *2020 American control conference*. accepted for publication. IEEE [invited paper]
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C9. William Barbour, Michael Wilbur[†], Ricardo Sandoval, Caleb Van Geffen, Brandon Hall, **Abhishek Dubey**, and Dan Work (2020). “Data Driven Methods for Effective Micromobility Parking”. In: *Proceedings of the Transportation Research Board Annual Meeting*
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C10. Shashank Shekhar, Ajay Chhokra[†], Hongyang Sun[†], Aniruddha Gokhale, **Abhishek Dubey**, and Xenofon D. Koutsoukos (2019b). “URMILA: A Performance and Mobility-Aware Fog/Edge Resource Management Middleware”. In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*, pp. 118–125
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C11. Sanchita Basak[†], Afiya Aman, Aron Laszka, **Abhishek Dubey**, and Bruno Leao (Oct. 2019). “Data-Driven Detection of Anomalies and Cascading Failures in Traffic Networks”. In: *Proceedings of the 11th Annual Conference of the Prognostics and Health Management Society (PHM)*

- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C12. Aparna Oruganti, Sanchita Basak[†], Fangzhou Sun[†], Hiba Baroud, and **Abhishek Dubey** (2019). “[Modeling and Predicting the Cascading Effects of Delay in Transit Systems](#)”. In: *Transportation Research Board Annual Meeting*
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C13. Timothy Krentz, **Abhishek Dubey**, and Gabor Karsai (2019). “[Short Paper: Towards An Edge-Located Time-Series Database](#)”. In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*, pp. 151–154
- *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C14. Charles Hartsell*, Nagabhushan Mahadevan, Shreyas Ramakrishna[†], **Abhishek Dubey**, Theodore Bapty, Taylor T. Johnson, Xenofon D. Koutsoukos, Janos Sztipanovits, and Gabor Karsai (2019a). “[CPS Design with Learning-Enabled Components: A Case Study](#)”. In: *Proceedings of the 30th International Workshop on Rapid System Prototyping, RSP 2019, New York, NY, USA, October 17-18, 2019*, pp. 57–63
- *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C15. Sanchita Basak[†], **Abhishek Dubey**, and Bruno P. Leao (2019). “[Analyzing the Cascading Effect of Traffic Congestion Using LSTM Networks](#)”. In: *2019 IEEE International Conference on Big Data (Big Data)*, pp. 2144–2153
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C16. Shreyas Ramakrishna[†], **Abhishek Dubey**, Matthew P. Burruss[†], Charles Hartsell*, Nagabhushan Mahadevan, Saideep Nannapaneni, Aron Laszka, and Gabor Karsai (2019). “[Augmenting Learning Components for Safety in Resource Constrained Autonomous Robots](#)”. In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*, pp. 108–117
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C17. Purboday Ghosh, Scott Eisele[†], **Abhishek Dubey**, Mary Metelko, István Madari, Péter Völgyesi, and Gabor Karsai (2019). “[On the Design of Fault-Tolerance in a Decentralized Software Platform for Power Systems](#)”. In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain*, pp. 52–60
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C18. Sanchita Basak[†], Fangzhou Sun[†], Saptarshi Sengupta, and **Abhishek Dubey** (2019). “[Data-Driven Optimization of Public Transit Schedule](#)”. In: *Big Data Analytics - 7th International Conference, BDA 2019, Ahmedabad, India*, pp. 265–284
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C19. Y. Du, H. Tu, S. Lukic, D. Lubkeman, **Abhishek Dubey**, and G. Karsai (Nov. 2018a). “[Development of a Controller Hardware-in-the-Loop Platform for Microgrid Distributed Control Applications](#)”. In: *2018 IEEE Electronic Power Grid (eGrid)*, pp. 1–6

- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C20. Aron Laszka, Scott Eisele[†], **Abhishek Dubey**, Gabor Karsai, and Karla Kvaternik (2018). “[TRANSAX: A Blockchain-Based Decentralized Forward-Trading Energy Exchanged for Transactive Microgrids](#)”. In: *24th IEEE International Conference on Parallel and Distributed Systems, ICPADS 2018, Singapore, December 11-13, 2018*, pp. 918–927
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper. [Acceptance Rate: 41 %.]*
- C21. Saqib Hasan[†], Amin Ghafouri, **Abhishek Dubey**, Gabor Karsai, and Xenofon D. Koutsoukos (2018). “[Vulnerability analysis of power systems based on cyber-attack and defense models](#)”. In: *2018 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference, ISGT 2018, Washington, DC, USA, February 19-22, 2018*, pp. 1–5
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- C22. William Barbour, Chinmaya Samal[†], Shankara Kuppa, **Abhishek Dubey**, and Daniel B. Work (2018). “[On the Data-Driven Prediction of Arrival Times for Freight Trains on U.S. Railroads](#)”. In: *21st International Conference on Intelligent Transportation Systems, ITSC 2018, Maui, HI, USA, November 4-7, 2018*, pp. 2289–2296
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C23. Fangzhou Sun[†], **Abhishek Dubey**, Chinmaya Samal[†], Hiba Baroud, and Chetan Kulkarni (2018). “[Short-Term Transit Decision Support System Using Multi-task Deep Neural Networks](#)”. In: *2018 IEEE International Conference on Smart Computing, SMARTCOMP 2018, Taormina, Sicily, Italy, June 18-20, 2018*, pp. 155–162
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- C24. H. Tu, Y. Du, H. Yu, S. Lukic, P. Volgyesi, M. Metelko, **Abhishek Dubey**, and G. Karsai (June 2018). “[An Adaptive Interleaving Algorithm for Multi-Converter Systems](#)”. In: *2018 9th IEEE International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*, pp. 1–7
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C25. Saideep Nannapaneni, Sankaran Mahadevan, and **Abhishek Dubey** (June 2018). “[Real-Time Control of Cyber-Physical Manufacturing Process Under Uncertainty](#)”. In: *Proceedings of ASME 2018 13th International Manufacturing Science and Engineering Conference*. Vol. Volume 3: Manufacturing Equipment and Systems. International Manufacturing Science and Engineering Conference. V003T02A001
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C26. Saideep Nannapaneni, **Abhishek Dubey**, and Sankaran Mahadevan (2018). “[Automated aircraft separation safety assurance using Bayesian networks](#)”. In: *2018 Aviation Technology, Integration, and Operations Conference*, p. 3199
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*

- C27. H. Tu, Y. Du, H. Yu, S. Lukic, M. Metelko, P. Volgyesi, **Abhishek Dubey**, and G. Karsai (Sept. 2018). “A Hardware-in-the-Loop Real-Time Testbed for Microgrid Hierarchical Control”. In: *2018 IEEE Energy Conversion Congress and Exposition (ECCE)*, pp. 2053–2059
 ▪ Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C28. Fangzhou Sun[†], **Abhishek Dubey**, C Kulkarni, Nagbhushan Mahadevan, and Ali Guarneros Luna (2018). “A data driven health monitoring approach to extending smallsat missions”. In: *Conference Proceedings, Annual Conference of The Prognostics And Health Management Society*
 ▪ Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C29. Y. Du, H. Tu, S. Lukic, **Abhishek Dubey**, and G. Karsai (Sept. 2018). “Distributed Microgrid Synchronization Strategy Using a Novel Information Architecture Platform”. In: *2018 IEEE Energy Conversion Congress and Exposition (ECCE)*, pp. 2060–2066
 ▪ Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C30. Chinmaya Samal[†], **Abhishek Dubey**, and Lillian J. Ratliff (2018). “Mobilytics- An Extensible, Modular and Resilient Mobility Platform”. In: *2018 IEEE International Conference on Smart Computing, SMARTCOMP 2018, Taormina, Sicily, Italy, June 18-20, 2018*, pp. 356–361
 ▪ Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C31. Y. Du, H. Tu, S. Lukic, D. Lubkeman, **Abhishek Dubey**, and G. Karsai (Apr. 2018b). “Resilient Information Architecture Platform for Smart Systems (RIAPS): Case Study for Distributed Apparent Power Control”. In: *2018 IEEE/PES Transmission and Distribution Conference and Exposition (T D)*, pp. 1–5
 ▪ Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C32. Saqib Hasan[†], Ajay Chhokra[†], **Abhishek Dubey**, Nagabhushan Mahadevan, Gabor Karsai, Rishabh Jain, and Srdjan Lukic (2017). “A simulation testbed for cascade analysis”. In: *IEEE Power & Energy Society Innovative Smart Grid Technologies Conference, ISGT 2017, Washington, DC, USA, April 23-26, 2017*, pp. 1–5
 ▪ Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C33. Shweta Prabhat Khare, János Sallai, **Abhishek Dubey**, and Aniruddha S. Gokhale (2017). “Short Paper: Towards Low-Cost Indoor Localization Using Edge Computing Resources”. In: *20th IEEE International Symposium on Real-Time Distributed Computing, ISORC 2017, Toronto, ON, Canada, May 16-18, 2017*, pp. 28–31
 ▪ Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C34. Saideep Nannapaneni, **Abhishek Dubey**, and Sankaran Mahadevan (2017). “Performance evaluation of smart systems under uncertainty”. In: *2017 IEEE SmartWorld*, pp. 1–8
 ▪ Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- C35. Scott Eisele[†], István Madari, **Abhishek Dubey**, and Gabor Karsai (2017). “[RIAPS: Resilient Information Architecture Platform for Decentralized Smart Systems](#)”. In: *20th IEEE International Symposium on Real-Time Distributed Computing, ISORC 2017, Toronto, ON, Canada, May 16-18, 2017*, pp. 125–132
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C36. Péter Völgyesi, **Abhishek Dubey**, Timothy Krentz, István Madari, Mary Metelko, and Gabor Karsai (2017). “[Time synchronization services for low-cost fog computing applications](#)”. In: *International Symposium on Rapid System Prototyping, RSP 2017, Shortening the Path from Specification to Prototype, October 19-20, 2017, Seoul, South Korea*, pp. 57–63
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C37. S. Hasan[†], A. Ghafouri, **Abhishek Dubey**, G. Karsai, and X. Koutsoukos (Sept. 2017). “[Heuristics-based approach for identifying critical N-k contingencies in power systems](#)”. In: *2017 Resilience Week (RWS)*, pp. 191–197
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C38. **Abhishek Dubey**, Gabor Karsai, Aniruddha Gokhale, William Emfinger, and Pranav Kumar (2017). “[DREMS-OS: An operating system for managed distributed real-time embedded systems](#)”. In: *2017 6th International Conference on Space Mission Challenges for Information Technology (SMC-IT)*. IEEE, pp. 114–119
- Contributions: 90 %. Developed the concept and wrote the manuscript.
- C39. Fangzhou Sun[†], Chinmaya Samal[†], Jules White, and **Abhishek Dubey** (2017). “[Unsupervised Mechanisms for Optimizing On-Time Performance of Fixed Schedule Transit Vehicles](#)”. In: *2017 IEEE International Conference on Smart Computing, SMARTCOMP 2017, Hong Kong, China, May 29-31, 2017*, pp. 1–8
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C40. **Abhishek Dubey**, Gabor Karsai, and Subhav Pradhan[†] (2017). “[Resilience at the edge in cyber-physical systems](#)”. In: *Second International Conference on Fog and Mobile Edge Computing, FMEC 2017, Valencia, Spain, May 8-11, 2017*, pp. 139–146
- Contributions: 90 %. Developed the concept and wrote the manuscript.
- C41. Fangzhou Sun[†], **Abhishek Dubey**, and Jules White (2017). “[DxNAT - Deep neural networks for explaining non-recurring traffic congestion](#)”. In: *2017 IEEE International Conference on Big Data, BigData 2017, Boston, MA, USA, December 11-14, 2017*, pp. 2141–2150
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C42. Y. Du, H. Tu, S. Lukic, D. Lubkeman, **Abhishek Dubey**, and G. Karsai (Sept. 2017). “[Implementation of a distributed microgrid controller on the Resilient Information Architecture Platform for Smart Systems \(RIAPS\)](#)”. in: *2017 North American Power Symposium (NAPS)*, pp. 1–6
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.

- C43. Aparna Oruganti, Fangzhou Sun[†], Hiba Baroud, and **Abhishek Dubey** (2016). “[DelayRadar: A multivariate predictive model for transit systems](#)”. In: *2016 IEEE International Conference on Big Data, BigData 2016, Washington DC, USA, December 5-8, 2016*, pp. 1799–1806
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C44. Fangzhou Sun[†], Yao Pan, Jules White, and **Abhishek Dubey** (2016). “[Real-Time and Predictive Analytics for Smart Public Transportation Decision Support System](#)”. In: *2016 IEEE International Conference on Smart Computing, SMARTCOMP 2016, St Louis, MO, USA, May 18-20, 2016*, pp. 1–8
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C45. Gautam Biswas, Hamed Khorasgani, Gerald Stanje, **Abhishek Dubey**, Somnath Deb, and Sudipto Ghoshal (2016a). “[An application of data driven anomaly identification to spacecraft telemetry data](#)”. In: *Prognostics and Health Management Conference*
- *Contributions: 10%.* Participated in paper discussions and wrote/edited a minor portion of the paper.
- C46. A. Chhokra[†], S. Abdelwahed, **Abhishek Dubey**, S. Neema, and G. Karsai (June 2015). “[From system modeling to formal verification](#)”. In: *2015 Electronic System Level Synthesis Conference (ESLsyn)*, pp. 41–46
- *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C47. R. Jain, S. M. Lukic, A. Chhokra[†], N. Mahadevan, **Abhishek Dubey**, and G. Karsai (Oct. 2015). “[An improved distance relay model with directional element, and memory polarization for TCD based fault propagation studies](#)”. In: *2015 North American Power Symposium (NAPS)*, pp. 1–6
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C48. Daniel Balasubramanian, **Abhishek Dubey**, William R. Otte, William Emfinger, Pranav Srinivas Kumar, and Gabor Karsai (2014). “[A Rapid Testing Framework for a Mobile Cloud](#)”. In: *25nd IEEE International Symposium on Rapid System Prototyping, RSP 2014, New Delhi, India, October 16-17, 2014*, pp. 128–134
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C49. G. Martins, A. Bhattacharjee, **Abhishek Dubey**, and X. Koutsoukos (Aug. 2014). “[Performance evaluation of an authentication mechanism in time-triggered networked control systems](#)”. In: *2014 7th International Symposium on Resilient Control Systems (ISRCS)*, pp. 1–6
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C50. Nagabhushan Mahadevan, **Abhishek Dubey**, Gabor Karsai, Anurag Srivastava, and Chen-Ching Liu (Jan. 2014). “[Temporal Causal Diagrams for diagnosing failures in cyber-physical systems](#)”. In: *Annual Conference of the Prognostics and Health Management Society*
- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- C51. S. Pradhan[†], W. Emfinger, **Abhishek Dubey**, W. R. Otte, D. Balasubramanian, A. Gokhale, G. Karsai, and A. Coglio (Sept. 2014). “Establishing Secure Interactions across Distributed Applications in Satellite Clusters”. In: *2014 IEEE International Conference on Space Mission Challenges for Information Technology*, pp. 67–74
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C52. Subhav Pradhan[†], William Otte, **Abhishek Dubey**, Aniruddha Gokhale, and Gabor Karsai (2014). “Key Considerations for a Resilient and Autonomous Deployment and Configuration Infrastructure for Cyber-Physical Systems”. In: *Proceedings of the 11th IEEE International Conference and Workshops on the Engineering of Autonomic and Autonomous Systems (EASE'14)*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C53. William R. Otte, **Abhishek Dubey**, and Gabor Karsai (2014). “A resilient and secure software platform and architecture for distributed spacecraft”. In: *Sensors and Systems for Space Applications VII*. ed. by Khanh D. Pham and Joseph L. Cox. Vol. 9085. International Society for Optics and Photonics. SPIE, pp. 121–130
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C54. Saideep Nannapaneni, **Abhishek Dubey**, Sherif Abdelwahed, Sankaran Mahadevan, and Sandeep Neema (Oct. 2014). “A Model-Based Approach for Reliability Assessment in Component-Based Systems”. In: *PHM 2014 - Proceedings of the Annual Conference of the Prognostics and Health Management Society 2014*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C55. Gabor Karsai, Daniel Balasubramanian, **Abhishek Dubey**, and William Otte (2014). “Distributed and Managed: Research Challenges and Opportunities of the Next Generation Cyber-Physical Systems”. In: *17th IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing, ISORC 2014, Reno, NV, USA, June 10-12, 2014*, pp. 1–8
- Contributions: 25% collaboratively wrote the manuscript.
- C56. William Otte, **Abhishek Dubey**, Subhav Pradhan[†], Prithviraj Patil, Aniruddha S. Gokhale, Gabor Karsai, and Johnny Willemsen (2013). “F6COM: A component model for resource-constrained and dynamic space-based computing environments”. In: *16th IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing, ISORC 2013, Paderborn, Germany, June 19-21, 2013*, pp. 1–8
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C57. Nagabhushan Mahadevan, **Abhishek Dubey**, and Gabor Karsai (2012). “Architecting Health Management into Software Component Assemblies: Lessons Learned from the ARINC-653 Component Mode”. In: *15th IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing, ISORC 2012, Shenzhen, China, April 11-13, 2012*, pp. 79–86
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- C58. Qian Chen, R. Mehrotra, **Abhishek Dubey**, S. Abdelwahed, and K. Rowland (Mar. 2012). "On state of the art in virtual machine security". In: *2012 Proceedings of IEEE Southeastcon*, pp. 1–6
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C59. **Abhishek Dubey**, W. Emfinger, A. Gokhale, G. Karsai, W. R. Otte, J. Parsons, C. Szabo, A. Coglio, E. Smith, and P. Bose (Mar. 2012). "A software platform for fractionated spacecraft". In: *2012 IEEE Aerospace Conference*, pp. 1–20
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C60. Nilabja Roy, **Abhishek Dubey**, Aniruddha S. Gokhale, and Larry W. Dowdy (2011). "A Capacity Planning Process for Performance Assurance of Component-based Distributed Systems". In: *ICPE'11 - Second Joint WOSP/SIPEW International Conference on Performance Engineering, Karlsruhe, Germany, March 14-16, 2011*, pp. 259–270
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C61. **Abhishek Dubey**, G. Karsai, and N. Mahadevan (Mar. 2011). "Model-based software health management for real-time systems". In: *2011 Aerospace Conference*, pp. 1–18
- Contributions: 90 %. Developed the concept and wrote the manuscript.
- C62. R. Mehrotra, **Abhishek Dubey**, S. Abdelwahed, and W. Monceaux (Apr. 2011). "Large Scale Monitoring and Online Analysis in a Distributed Virtualized Environment". In: *2011 Eighth IEEE International Conference and Workshops on Engineering of Autonomic and Autonomous Systems*, pp. 1–9
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C63. P. Pan, **Abhishek Dubey**, and L. Piccoli (Mar. 2010). "Dynamic Workflow Management and Monitoring Using DDS". in: *2010 Seventh IEEE International Conference and Workshops on Engineering of Autonomic and Autonomous Systems*, pp. 20–29
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- C64. Tripti Saxena, **Abhishek Dubey**, Daniel Balasubramanian, and Gabor Karsai (2010). "Enabling self-management by using model-based design space exploration". In: *2010 Seventh IEEE International Conference and Workshops on Engineering of Autonomic and Autonomous Systems*. IEEE, pp. 137–144
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- C65. Jaiganesh Balasubramanian, Aniruddha S. Gokhale, **Abhishek Dubey**, Friedhelm Wolf, Chenyang Lu, Christopher D. Gill, and Douglas C. Schmidt (2010). "Middleware for Resource-Aware Deployment and Configuration of Fault-Tolerant Real-time Systems". In: *16th IEEE Real-Time and Embedded Technology and Applications Symposium, RTAS 2010, Stockholm, Sweden, April 12-15, 2010*, pp. 69–78
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- C66. **Abhishek Dubey**, Gabor Karsai, Róbert Kereskényi, and Nagabhushan Mahadevan (2010). “A Real-Time Component Framework: Experience with CCM and ARINC-653”. In: *13th IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing, ISORC 2010, Carmona, Sevilla, Spain, 5-6 May 2010*, pp. 143–150
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C67. **Abhishek Dubey**, Gabor Karsai, and Sherif Abdelwahed (2009). “Compensating for Timing Jitter in Computing Systems with General-Purpose Operating Systems”. In: *2009 IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing, ISORC 2009, Tokyo, Japan, 17-20 March 2009*, pp. 55–62
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C68. **Abhishek Dubey**, Derek Riley, Sherif Abdelwahed, and Ted Bapty (2009). “Modeling and Analysis of Probabilistic Timed Systems”. In: *16th Annual IEEE International Conference and Workshop on the Engineering of Computer Based Systems, ECBS 2009, San Francisco, California, USA, 14-16 April 2009*, pp. 69–78
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C69. **Abhishek Dubey**, L. Piccoli, J. B. Kowalkowski, J. N. Simone, X. Sun[†], G. Karsai, and S. Neema (Apr. 2009). “Using Runtime Verification to Design a Reliable Execution Framework for Scientific Workflows”. In: *2009 Sixth IEEE Conference and Workshops on Engineering of Autonomic and Autonomous Systems*, pp. 87–96
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C70. **Abhishek Dubey** (2009). “Algorithms for Synthesizing Safe Sets of Operation for Embedded Systems”. In: *16th Annual IEEE International Conference and Workshop on the Engineering of Computer Based Systems, ECBS 2009, San Francisco, California, USA, 14-16 April 2009*, pp. 149–155
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C71. **Abhishek Dubey**, S. Nordstrom, T. Keskinpala, S. Neema, T. Bapty, and G. Karsai (Mar. 2008). “Towards A Model-Based Autonomic Reliability Framework for Computing Clusters”. In: *Fifth IEEE Workshop on Engineering of Autonomic and Autonomous Systems (EASE 2008)*, pp. 75–85
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C72. S. Nordstrom, **Abhishek Dubey**, T. Keskinpala, R. Datta, S. Neema, and T. Bapty (Mar. 2007). “Model Predictive Analysis for Autonomic Workflow Management in Large-scale Scientific Computing Environments”. In: *Fourth IEEE International Workshop on Engineering of Autonomic and Autonomous Systems (EASE’07)*, pp. 37–42
 ■ Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- C73. **Abhishek Dubey**, S. Nordstrom, T. Keskinpala, S. Neema, and T. Bapty (Mar. 2006). “Verifying Autonomic Fault Mitigation Strategies in Large Scale Real-Time Systems”. In: *Third IEEE International Workshop on Engineering of Autonomic Autonomous Systems (EASE’06)*, pp. 129–140
 ■ Contributions: 90 %. Developed the concept and wrote the manuscript.
- C74. Steven Nordstrom, Ted Bapty, Sandeep Neema, **Abhishek Dubey**, and Turker Keskinpala (July 2006). “A Guided Explorative Approach for Autonomic Healing of Model-Based Systems”. In: *Second IEEE conference on Space Mission Challenges for Information Technology (SMC-IT)*. Pasadena, CA

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- C75. Turker Keskinpala, **Abhishek Dubey**, Steve Nordstrom, Ted Bapty, and Sandeep Neema (2006). “[A Model Driven Tool for Automated System Level Testing of Middleware](#)”. In: *Systems Testing and Validation*, p. 19
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C76. S. Nordstrom, **Abhishek Dubey**, T. Keskinpala, S. Neema, and T. Bapty (Mar. 2006). “[GHOST: Guided Healing and Optimization Search Technique for Healing Large-Scale Embedded Systems](#)”. In: *Third IEEE International Workshop on Engineering of Autonomic Autonomous Systems (EASE'06)*, pp. 54–60
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- C77. **Abhishek Dubey**, X. Wu, H. Su, and T. J. Koo (2005). “[Computation Platform for Automatic Analysis of Embedded Software Systems Using Model Based Approach](#)”. In: *Automated Technology for Verification and Analysis*. Ed. by Doron A. Peled and Yih-Kuen Tsay. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 114–128. ISBN: 978-3-540-31969-6
- *Contributions: 90 %. Developed the concept and wrote the manuscript.*

Book Chapters (10 articles)

- Ted Bapty, **Abhishek Dubey**, and Janos Sztipanovits (2020). “[Cyber-Physical Vulnerability Analysis of IoT Applications Using Multi-Modeling](#)”. In: *Modeling and Design of Secure Internet of Things*. John Wiley and Sons. Chap. 8, pp. 161–184. ISBN: 9781119593386
- B1. *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B2. Shreyas Ramakrishna[†], Charles Hartsell*, **Abhishek Dubey**, Partha Pal, and Gabor Karsai (2020). “[A Methodology for Automating Assurance Case Generation](#)”. In: *Thirteenth International Tools and Methods of Competitive Engineering Symposium (TMCE 2020)*
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B3. Peng Zhang, Douglas C. Schmidt, Jules White, and **Abhishek Dubey** (2019). “[Chapter Seven - Consensus mechanisms and information security technologies](#)”. In: *Advances in Computers*. Vol. 115. Oreilly, pp. 181–209
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- B4. Michael A. Walker, Douglas C. Schmidt, and **Abhishek Dubey** (2019). “[Chapter Six - Testing at scale of IoT blockchain applications](#)”. In: *Advances in Computers*. Vol. 115. Oreilly, pp. 155–179
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- B5. Ajay Chhokra[†], **Abhishek Dubey**, Nagabhushan Mahadevan, Saqib Hasan[†], and Gabor Karsai (2018). “[Diagnosis in Cyber-Physical Systems with Fault Protection Assemblies](#)”. In: *Diagnosability, Security and Safety of Hybrid Dynamic and Cyber-Physical Systems*. Ed. by Moamar Sayed-Mouchaweh. Cham: Springer International Publishing. Chap. Chapter 8, pp. 201–225. ISBN: 978-3-319-74962-4

- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B6. Shashank Shekhar, Fangzhou Sun[†], **Abhishek Dubey**, Aniruddha Gokhale, Himanshu Neema, Martin Lehofer, and Dan Freudberg (2016). “[A Smart Decision Support System for Public Transit Operations](#)”. In: *Internet of Things and Data Analytics Handbook*
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B7. Subhav Pradhan[†], **Abhishek Dubey**, and Aniruddha S. Gokhale (2016a). “[Designing a Resilient Deployment and Reconfiguration Infrastructure for Remotely Managed Cyber-Physical Systems](#)”. In: *Software Engineering for Resilient Systems - 8th International Workshop, SERENE 2016, Gothenburg, Sweden, September 5-6, 2016, Proceedings*, pp. 88–104
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B8. **Abhishek Dubey**, Gabor Karsai, and Nagabhushan Mahadevan (2013). “[Fault-Adaptivity in Hard Real-Time Component-Based Software Systems](#)”. In: *Software Engineering for Self-Adaptive Systems II: International Seminar, Dagstuhl Castle, Germany, October 24-29, 2010 Revised Selected and Invited Papers*. Ed. by Rogério de Lemos, Holger Giese, Hausi A. Müller, and Mary Shaw. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 294–323. ISBN: 978-3-642-35813-5
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B9. Rajat Mehrotra, **Abhishek Dubey**, Sherif Abdelwahed, and Asser N. Tantawi (2012). “[Power-Aware Modeling and Autonomic Management Framework for Distributed Computing Systems](#)”. In: *Handbook of Energy-Aware and Green Computing - Two Volume Set*. CRC Press, pp. 621–648
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- B10. Sherif Abdelwahed, **Abhishek Dubey**, Gabor Karsai, and Nagabhushan Mahadevan (2011). “[Model-based Tools and Techniques for Real-Time System and Software Health Management](#)”. In: *Machine Learning and Knowledge Discovery for Engineering Systems Health Management*. CRC Press. Chap. Chapter 9, p. 285
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*

Workshop Publications (Refereed) (39 articles)

- W1. Michael Wilbur[†], Philip Pugliese, Aron Laszka, and **Abhishek Dubey** (2021). “[Efficient Data Management for Intelligent Urban Mobility Systems](#)”. In: *Proceedings of the Workshop on AI for Urban Mobility at the 35th AAAI Conference on Artificial Intelligence (AAAI-21)*
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*
- W2. Ajay Chhokra[†], Carlos Barreto, **Abhishek Dubey**, Gabor Karsai, and Xenofon Koutsoukos (2021). “[Power-Attack: A comprehensive tool-chain for modeling and simulating attacks in power systems](#)”. In: *9th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, MSCPES@CPSIoTWeek*
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*

- W3. Hussain M. Mustafa, Mohini Bariya, K.S. Sajan, Ajay Chhokra[†], Anurag Srivastava, **Abhishek Dubey**, Alexandra von Meier, and Gautam Biswas (2021). “RT-METER: A Real-Time, Multi-Layer Cyber–Power Testbed for Resiliency Analysis”. In: *9th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, MSCPES@CPSIoTWeek*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W4. Juan Martinez, Ayan Mukhopadhyay Afiya Ayman, Michael Wilbur[†], Philip Pugliese, Dan Freudberg, Aron Laszka, and **Abhishek Dubey** (2021). “Predicting Public Transportation Load to Estimate the Probability of Social Distancing Violations”. In: *Proceedings of the Workshop on AI for Urban Mobility at the 35th AAAI Conference on Artificial Intelligence (AAAI-21)*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W5. Zhuangwei Kang, Robert Canady, **Abhishek Dubey**, Aniruddha Gokhale, Shashank Shekhar, and Matous Sedlacek (2021). “A Study of Publish/Subscribe Middleware Under Different IoT Traffic Conditions”. In: *Proceedings of the 7th Workshop on Middleware and Applications for the Internet of Things, M4IoT@Middleware*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W6. W. Barbour, M. Wilbur[†], R. Sandoval, A. **Dubey**, and D. B. Work (2020). “Streaming computation algorithms for spatiotemporal micromobility service availability”. In: *2020 IEEE Workshop on Design Automation for CPS and IoT (DESTION)*, pp. 32–38
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W7. Kaduveltykunnal Sajan, Mohini Bariya, Sanchita Basak[†], Anurag K. Srivastava, **Abhishek Dubey**, Alexandra von Meier, and Gautam Biswas (2020). “Realistic Synchrophasor Data Generation for Anomaly Detection and Event Classification”. In: *8th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, MSCPES@CPSIoTWeek*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W8. Vijay Kumar Sundar, Shreyas Ramakrishna[†], Zahra Rahiminasab, Arvind Easwaran, and **Abhishek Dubey** (2020). “Out-of-Distribution Detection in Multi-Label Datasets using Latent Space of β -VAE”. in: *2020 Workshop on Assured Autonomous Systems (WAAS)*. IEEE
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W9. Saideep Nannapaneni and **Abhishek Dubey** (2019). “Towards demand-oriented flexible rerouting of public transit under uncertainty”. In: *Proceedings of the Fourth Workshop on International Science of Smart City Operations and Platforms Engineering, SCOPE@CPSIoTWeek 2019, Montreal, QC, Canada*, pp. 35–40
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W10. Geoffrey Pettet[†], Saroj Sahoo, and **Abhishek Dubey** (2019). “Towards an Adaptive Multi-Modal Traffic Analytics Framework at the Edge”. In: *IEEE International Conference on Pervasive Computing and Communications Workshops, PerCom Workshops 2019, Kyoto, Japan, March 11-15, 2019*, pp. 511–516

- *Contributions: 40 %.* Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W11. Jose Paolo Talusan, Francis Tiausas, Keiichi Yasumoto, Michael Wilbur[†], Geoffrey Pettet[†], **Abhishek Dubey**, and Shameek Bhattacharjee (2019). “Smart Transportation Delay and Resiliency Testbed Based on Information Flow of Things Middleware”. In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA, June 12-15, 2019*, pp. 13–18
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W12. Yue Zhang, Scott Eisele[†], **Abhishek Dubey**, Aron Laszka, and Anurag K. Srivastava (2019). “Cyber-Physical Simulation Platform for Security Assessment of Transactive Energy Systems”. In: *7th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, MSCPES@CPSIoTWeek 2019, Montreal, QC, Canada*, pp. 1–6
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W13. Charles Hartsell*, Nagabhushan Mahadevan, Shreyas Ramakrishna[†], **Abhishek Dubey**, Theodore Bapty, Taylor T. Johnson, Xenofon D. Koutsoukos, Janos Sztipanovits, and Gabor Karsai (Apr. 2019b). “Model-based design for CPS with learning-enabled components”. In: *Proceedings of the Workshop on Design Automation for CPS and IoT, DESTION@CPSIoTWeek 2019, Montreal, QC, Canada*, pp. 1–9
- *Contributions: 10%.* Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- W14. Aron Laszka, Anastasia Mavridou, Scott Eisele[†], Emmanouela Statchtari, and **Abhishek Dubey** (Sept. 2019). “VeriSolid for TRANSAX: Correct-by-Design Ethereum Smart Contracts for Energy Trading”. In: *First International Summer School on Security and Privacy for Blockchains and Distributed Ledger Technologies, BDLT 2019, Vienna, Austria*
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W15. Aron Laszka, Anastasia Mavridou, and **Abhishek Dubey** (2018). “Resilient and Trustworthy Transactive Platform for Smart and Connected Communities”. In: *High Confidence Software and Systems Conference*
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W16. H. Purohit, S. Nannapaneni, **Abhishek Dubey**, P. Karuna, and G. Biswas (Apr. 2018). “Structured Summarization of Social Web for Smart Emergency Services by Uncertain Concept Graph”. In: *2018 IEEE International Science of Smart City Operations and Platforms Engineering in Partnership with Global City Teams Challenge (SCOPE-GCTC)*, pp. 30–35
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W17. Chinmaya Samal[†], Fangzhou Sun[†], and **Abhishek Dubey** (2017). “SpeedPro: A Predictive Multi-Model Approach for Urban Traffic Speed Estimation”. In: *2017 IEEE International Conference on Smart Computing, SMARTCOMP 2017, Hong Kong, China, May 29-31, 2017*, pp. 1–6
- *Contributions: 25 %.* Collaboratively developed the research ideas and wrote/edited a portion of the paper.

- W18. Joshua Tan, Christine Kendrick, **Abhishek Dubey**, and Sokwoo Rhee (2017). “Indicator frameworks”. In: *Proceedings of the 2nd International Workshop on Science of Smart City Operations and Platforms Engineering, SCOPE@CPSWeek 2017, Pittsburgh, PA, USA, April 21, 2017*, pp. 19–25
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- W19. Amin Ghafouri, Aron Laszka, **Abhishek Dubey**, and Xenofon D. Koutsoukos (2017). “Optimal detection of faulty traffic sensors used in route planning”. In: *Proceedings of the 2nd International Workshop on Science of Smart City Operations and Platforms Engineering, SCOPE@CPSWeek 2017, Pittsburgh, PA, USA, April 21, 2017*, pp. 1–6
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W20. S. Hasan[†], **Abhishek Dubey**, A. Chhokra[†], N. Mahadevan, G. Karsai, and X. Koutsoukos (Apr. 2017). “A modeling framework to integrate exogenous tools for identifying critical components in power systems”. In: *2017 Workshop on Modeling and Simulation of Cyber-Physical Energy Systems (MSCPES)*, pp. 1–6
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W21. Ajay Chhokra[†], Amogh Kulkarni, Saqib Hasan[†], **Abhishek Dubey**, Nagabhushan Mahadevan, and Gabor Karsai (2017). “A Systematic Approach of Identifying Optimal Load Control Actions for Arresting Cascading Failures in Power Systems”. In: *Proceedings of the 2nd Workshop on Cyber-Physical Security and Resilience in Smart Grids, SPSR-SG@CPSWeek 2017, Pittsburgh, PA, USA, April 21, 2017*, pp. 41–46
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- W22. Scott Eisele[†], Geoffrey Pettet[†], **Abhishek Dubey**, and Gabor Karsai (2017). “Towards an architecture for evaluating and analyzing decentralized Fog applications”. In: *IEEE Fog World Congress, FWC 2017, Santa Clara, CA, USA, October 30 - Nov. 1, 2017*, pp. 1–6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W23. Jonatan Bergquist, Aron Laszka, Monika Sturm, and **Abhishek Dubey** (2017). “On the design of communication and transaction anonymity in blockchain-based transactive microgrids”. In: *Proceedings of the 1st Workshop on Scalable and Resilient Infrastructures for Distributed Ledgers, SERIAL@Middleware 2017, Las Vegas, NV, USA, December 11-15, 2017*, 3:1–3:6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W24. Michael A. Walker, **Abhishek Dubey**, Aron Laszka, and Douglas C. Schmidt (2017). “PlaTIBART: a platform for transactive IoT blockchain applications with repeatable testing”. In: *Proceedings of the 4th Workshop on Middleware and Applications for the Internet of Things, M4IoT@Middleware 2017, Las Vegas, NV, USA, December 11, 2017*, pp. 17–22
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- W25. Saideep Nannapaneni, Sankaran Mahadevan, Subhav Pradhan[†], and **Abhishek Dubey** (2016). “Towards Reliability-Based Decision Making in Cyber-Physical Systems”. In: *2016 IEEE International Conference on Smart Computing, SMARTCOMP 2016, St Louis, MO, USA, May 18-20, 2016*, pp. 1–6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W26. **Abhishek Dubey**, Subhav Pradhan[†], Douglas C. Schmidt, Sebnem Rusitschka, and Monika Sturm (2016). “The Role of Context and Resilient Middleware in Next Generation Smart Grids”. In: *Proceedings of the 3rd Workshop on Middleware for Context-Aware Applications in the IoT, M4IoT@Middleware 2016, Trento, Italy, December 12-13, 2016*, pp. 1–6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W27. Himanshu Neema, William Emfinger, and **Abhishek Dubey** (2016). “A Reusable and Extensible Web-Based Co-Simulation Platform for Transactive Energy Systems”. In: *Proceedings of the 3rd International Transactive Energy Systems, Portland, Oregon, USA*. vol. 12
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- W28. S. Pradhan[†], **Abhishek Dubey**, S. Neema, and A. Gokhale (Apr. 2016). “Towards a generic computation model for smart city platforms”. In: *2016 1st International Workshop on Science of Smart City Operations and Platforms Engineering (SCOPE) in partnership with Global City Teams Challenge (GCTC) (SCOPE - GCTC)*, pp. 1–6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W29. A. Chhokra[†], **Abhishek Dubey**, N. Mahadevan, and G. Karsai (Apr. 2015). “A component-based approach for modeling failure propagations in power systems”. In: *2015 Workshop on Modeling and Simulation of Cyber-Physical Energy Systems (MSCPES)*, pp. 1–6
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W30. Subhav M. Pradhan[†], **Abhishek Dubey**, Aniruddha S. Gokhale, and Martin Lehofer (2015). “CHARIOT: a domain specific language for extensible cyber-physical systems”. In: *Proceedings of the Workshop on Domain-Specific Modeling, DSM@SPLASH 2015, Pittsburgh, PA, USA, October 27, 2015*, pp. 9–16
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W31. **Abhishek Dubey**, Monika Sturm, Martin Lehofer, and Janos Sztipanovits (2015). “Smart City Hubs: Opportunities for Integrating and Studying Human CPS at Scale”. In: *Workshop on Big Data Analytics in CPS: Enabling the Move from IoT to Real-Time Control*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- W32. Pranav Srinivas Kumar, **Abhishek Dubey**, and Gabor Karsai (2014). “Colored Petri Net-based Modeling and Formal Analysis of Component-based Applications”. In: *Proceedings of the 11th Workshop on Model-Driven Engineering, Verification and Validation co-located with 17th International Conference on Model Driven Engineering Languages and Systems, MoDeV@MODELS 2014, Valencia, Spain, September 30, 2014*, pp. 79–88

- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- W33. Daniel Balasubramanian, Tihamer Levendovszky, **Abhishek Dubey**, and Gabor Karsai (2014). “[Taming Multi-Paradigm Integration in a Software Architecture Description Language](#)”. In: *Proceedings of the 8th Workshop on Multi-Paradigm Modeling co-located with the 17th International Conference on Model Driven Engineering Languages and Systems, MPM@MODELS 2014, Valencia, Spain, September 30, 2014*, pp. 67–76
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- W34. William Emfinger, Gabor Karsai, **Abhishek Dubey**, and Aniruddha S. Gokhale (2014). “[Analysis, verification, and management toolsuite for cyber-physical applications on time-varying networks](#)”. In: *Proceedings of the 4th ACM SIGBED International Workshop on Design, Modeling, and Evaluation of Cyber-Physical Systems, CyPhy 2014, Berlin, Germany, April 14-17, 2014*, pp. 44–47
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- W35. A **Dubey**, G Karsai, N Mahadevan, A Srivastava, CC Liu, and S Lukic (2013). “[Understanding Failure Dynamics in the Smart Electric Grid](#)”. In: *NSF Energy Cyber Physical System Workshop, Washington DC*
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- W36. **Abhishek Dubey**, Aniruddha Gokhale, Gabor Karsai, W Otte, and Johnny Willemsen (2013). “[A model-driven software component framework for fractionated spacecraft](#)”. In: *Proceedings of the 5th International Conference on Spacecraft Formation Flying Missions and Technologies (SFFMT)*. IEEE Munich, Germany
- *Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.*
- W37. J. Shi, R. Amgai, S. Abdelwahed, **Abhishek Dubey**, J. Humphreys, M. Alattar, and R. Jia (Apr. 2013). “[Generic modeling and analysis framework for shipboard system design](#)”. In: *2013 IEEE Electric Ship Technologies Symposium (ESTS)*, pp. 420–428
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- W38. Julie Chalfant, Blake Langland, Sherif Abdelwahed, Chryssostomos Chryssostomidis, Roger Dougal, **Abhishek Dubey**, Touria El Mezyani, JD Herbst, Thomas Kiehne, Juan Ordonez, et al. (2012). “[A collaborative early-stage ship design environment](#)”. In:
- *Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.*
- W39. **Abhishek Dubey**, Nagbhusan Mahadevan, and Robert Kereskenyi (2009). “[Reflex and healing architecture for software health management](#)”. In: *International workshop on software health management. IEEE conference on space mission challenges for information technology*
- *Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.*

Posters and Demonstrations

- D1. Zhuangwei Kang, Yogesh D. Barve, Shunxing Bao, **Abhishek Dubey**, and Aniruddha Gokhale (2021). “Poster Abstract: Configuration Tuning for Distributed IoT Message Systems Using Deep Reinforcement Learning”. In: *International Conference on Internet-of-Things Design and Implementation (IoTDI)*
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- D2. Geoffrey Pettet[†], Ayan Mukhopadhyay[‡], Chinmaya Samal[†], **Abhishek Dubey**, and Yevgeniy Vorobeychik (2019). “Incident management and analysis dashboard for fire departments: ICCPS demo”. In: *Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2019, Montreal, QC, Canada*, pp. 336–337
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D3. Charles Hartsell*, Nagabhushan Mahadevan, Shreyas Ramakrishna[†], **Abhishek Dubey**, Theodore Bapty, and Gabor Karsai (2019). “A CPS toolchain for learning-based systems: demo abstract”. In: *Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2019, Montreal, QC, Canada*, pp. 342–343
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- D4. Shashank Shekhar, Ajay Chhokra[†], Hongyang Sun[†], Aniruddha Gokhale, **Abhishek Dubey**, and Xenofon D. Koutsoukos (2019a). “Supporting fog/edge-based cognitive assistance IoT services for the visually impaired: poster abstract”. In: *Proceedings of the International Conference on Internet of Things Design and Implementation, IoTDI 2019, Montreal, QC, Canada*, pp. 275–276
- Contributions: 10%. Collaboratively developed the research ideas as a mentor to the team of students and edited a portion of the paper.
- D5. Scott Eisele[†], Purboday Ghosh, Keegan Campanelli[†], **Abhishek Dubey**, and Gabor Karsai (2019). “Demo: Transactive Energy Application with RIAPS”. in: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*, pp. 85–86
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D6. Matthew P. Burruss[†], Shreyas Ramakrishna[†], Gabor Karsai, and **Abhishek Dubey** (2019). “DeepNNCar: A Testbed for Deploying and Testing Middleware Frameworks for Autonomous Robots”. In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*, pp. 87–88 [undergraduate author]
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D7. Ajay Chhokra[†], Saqib Hasan[†], **Abhishek Dubey**, Nagabhushan Mahadevan, and Gabor Karsai (2017). “Diagnostics and prognostics using temporal causal models for cyber physical energy systems”. In: *Proceedings of the 8th International Conference on Cyber-Physical Systems, ICCPS 2017, Pittsburgh, Pennsylvania, USA, April 18-20, 2017*, p. 87
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- D8. Scott Eisele[†], **Abhishek Dubey**, Gabor Karsai, and Srdjan Lukic (2017). “[Transactive energy demo with RIAPS platform](#)”. In: *Proceedings of the 8th International Conference on Cyber-Physical Systems, ICCPS 2017, Pittsburgh, Pennsylvania, USA, April 18-20, 2017*, p. 91
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D9. Subhav Pradhan[†], **Abhishek Dubey**, Shweta Khare, Fangzhou Sun[†], János Sallai, Aniruddha S. Gokhale, Douglas C. Schmidt, Martin Lehofer, and Monika Sturm (2016). “[Poster Abstract: A Distributed and Resilient Platform for City-Scale Smart Systems](#)”. In: *IEEE/ACM Symposium on Edge Computing, SEC 2016, Washington, DC, USA, October 27-28, 2016*, pp. 99–100
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D10. William Emfinger, **Abhishek Dubey**, Péter Völgyesi, János Sallai, and Gabor Karsai (2016). “[Demo Abstract: RIAPS - A Resilient Information Architecture Platform for Edge Computing](#)”. In: *IEEE/ACM Symposium on Edge Computing, SEC 2016, Washington, DC, USA, October 27-28, 2016*, pp. 119–120
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D11. Ajay Chhokra[†], **Abhishek Dubey**, Nagabhushan Mahadevan, and Gabor Karsai (2016). “[Poster Abstract: Distributed Reasoning for Diagnosing Cascading Outages in Cyber Physical Energy Systems](#)”. In: *7th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2016, Vienna, Austria, April 11-14, 2016*, 33:1
- Contributions: 25 %. Collaboratively developed the research ideas and wrote/edited a portion of the paper.
- D12. Subhav Pradhan[†], **Abhishek Dubey**, and Aniruddha S. Gokhale (2016b). “[WiP Abstract: Platform for Designing and Managing Resilient and Extensible CPS](#)”. in: *7th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2016, Vienna, Austria, April 11-14, 2016*, 39:1
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D13. William Emfinger, Pranav Kumar, **Abhishek Dubey**, William Otte, Aniruddha Gokhale, and Gabor Karsai (2013). “[DREMS: A toolchain and platform for the rapid application development, integration, and deployment of managed distributed real-time embedded systems](#)”. In: *IEEE Real-time Systems Symposium*
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.
- D14. Rajat Mehrotra, **Abhishek Dubey**, Sherif Abdelwahed, and Asser N. Tantawi (2010). “[Integrated Monitoring and Control for Performance Management of Distributed Enterprise Systems](#)”. In: *MASCOTS 2010, 18th Annual IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, Miami, Florida, USA, August 17-19, 2010*, pp. 424–426
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

- D15. **Abhishek Dubey**, Sandeep Neema, Jim Kowalkowski, and Amitoj Singh (2008). "Scientific Computing Autonomic Reliability Framework". In: *Fourth International Conference on e-Science, e-Science 2008, 7-12 December 2008, Indianapolis, IN, USA*, pp. 352–353
- Contributions: 40 %. Devised and directed the main research ideas and wrote/edited a significant portion of the paper.

Invited Talks

- P1. "Challenges and Opportunities for Smart Transit Systems" (Apr. 2021). In: *Invited Presentation at Federal Transit Authority (virtual)*
- P2. "Mobility for All - Harnessing Emerging Transit Solutions for Underserved Communities" (Apr. 2021). In: *Presentation and Poster at the NSF SCC PI Meeting*
- P3. "Addressing Transit Accessibility and Public Health Challenges due to COVID-19" (Apr. 2021). In: *Presentation and Poster at the NSF SCC PI Meeting*
- P4. "Anomaly Detection in Spatio Temporal Systems" (Jan. 2021). In: *Invited Research Seminar at CISCO (Virtual)*
- P5. "Principled Approaches for Designing Resilient Decision Procedures in Smart and Connected Communities" (Mar. 2020). In: *Invited Presentation at Information and Computer Sciences, UC Irvine*
- P6. "Building Principled Decision Procedures for Urban Transit and Emergency Response Services" (Jan. 2020). In: *Invited Presentation at Berkley Institute of Transportation Studies*
- P7. "AI strategies for Urban Transportation and Electric Grid" (Jan. 2020). In: *Invited Presentation at Pacific Northwest National Laboratory*
- P8. "Resilient Cyber Physical Systems" (Oct. 2019). In: *Invited Presentation at Princeton Workshop on Resilience in Smart Grid*
- P9. "Principled Approaches for Resilient Emergency Response Procedures" (Dec. 2019). In: *NSF Workshop with JST In Tokyo Japan*
- P10. "Principled Approaches for Resilient Decision Procedures in Smart and Connected communities" (2019). In: *Invited Presentation at George Mason University*
- P11. "Principled Approaches for Resilient Decision Procedures in Smart and Connected communities" (Dec. 2019). In: *Adaptive Reflective Middleware Workshop Panel at Middleware Conference*
- P12. "Predictive Smart Emergency Response" (2019). In: *NSF Workshop on Emergency Response at University of South Carolina*
- P13. "Panel on AI in Smart Cities" (2019). In: *Metrolab Summit*
- P14. "Optimal Anomaly Detection and Dispatch Response in Transportation Networks" (2019). In: *Freedm Research Symposium at NCSU (Invited)*

- P15. "Internet of Things: Opportunities, Background and Challenges" (May 2019). In: *Tutorial and Presentation at Marriott International in Atlanta*
- P16. "Model-based design for CPS with learning Enabled Components" (May 2019). In: *Invited Presentation at SMC-IT workshop on Autonomy*
- P17. "Blockchains and CPS" (Dec. 2019). In: *New Directions in Software and Technology (NDIST)*
- P18. "Resilient and Trustworthy Transactive Platform for Smart and Connected Communities" (May 2018). In: *Invited Talk at Nanyang Technological University, Singapore*
- P19. "Resilient Analytics for Smart and Connected Communities" (Oct. 2018). In: *Invited Presentation at Oakridge National Lab, Knoxville*
- P20. "Resilient Cyber Physical Systems" (2018). In: *Invited Presentation at Missouri Science and Technology*
- P21. "Blockchain and IoT" (2017). In: *Keynote at M4IoT workshop at Middleware Conference*
- P22. "Communication Anonymity in Transactive Energy" (Dec. 2017). In: *Serial 2017 Workshop*
- P23. "Blockchains: Application to time-sensitive Systems" (2017). In: *Invited Presentation Hashed Health Summit, Nashville TN*
- P24. "Reliable Distributed Systems in Smart and Connected Communities" (2017). In: *Invited Presentation at Missouri Science and Technology*
- P25. "Drems-os: An operating system for managed distributed real-time embedded systems" (2017). In: *2017 6th International Conference on Space Mission Challenges for Information Technology (SMC-IT). IEEE*
- P26. "Education and Immersion Opportunities in Smart Cities" (Nov. 2017). In: *Education panel on Smart and connected communities*
- P27. "Social Routing Algorithms for Efficient Mobility" (June 2017). In: *US-Ignite Summit on Smart Cities*
- P28. "Digitalization disrupts traditional business" (2016). In: *Keynote at M4IoT workshop at Middleware Conference*
- P29. "Resilient Information Architecture for Smart Systems" (2016). In: *Invited Talk at Siemens, CT, Munich*

Conference Presentations

- P30. "Cyber-Physical Simulation Platform for Security Assessment of Transactive Energy Systems" (2019). In: *7th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, MSCPES@CPSIoTWeek 2019, Montreal, QC, Canada*
- P31. "Smart Transportation Delay and Resiliency Testbed Based on Information Flow of Things Middleware" (2019). In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA, June 12-15, 2019*

- P32. "Mobilytics-Gym: A Simulation Framework for Analyzing Urban Mobility Decision Strategies" (June 2019). In: *IEEE International Conference on Smart Computing, SMARTCOMP 2019, Washington, DC, USA*
- P33. "Towards an Adaptive Multi-Modal Traffic Analytics Framework at the Edge" (2019). In: *IEEE International Conference on Pervasive Computing and Communications Workshops, PerCom Workshops 2019, Kyoto, Japan, March 11-15, 2019*
- P34. "Towards demand-oriented flexible rerouting of public transit under uncertainty" (2019). In: *Fourth Workshop on International Science of Smart City Operations and Platforms Engineering, SCOPE@CPSIoTWeek 2019, Montreal, QC, Canada*
- P35. "Demo: Transactive Energy Application with RIAPS" (2019). In: *IEEE 22nd International Symposium on Real-Time Distributed Computing, ISORC 2019, Valencia, Spain, May 7-9, 2019*
- P36. "TRANSAX: A Blockchain-Based Decentralized Forward-Trading Energy Exchanged for Transactive Microgrids" (2018). In: *24th IEEE International Conference on Parallel and Distributed Systems, ICPADS 2018, Singapore, December 11-13, 2018*
- P37. "Role of Blockchains in Decentralized Cyber-Physical Systems" (2017). In: *Invited Talk at Siemens Blockchain Workshop, Erlangen, Germany*
- P38. "DxNAT - Deep neural networks for explaining non-recurring traffic congestion" (2017). In: *2017 IEEE International Conference on Big Data, BigData 2017, Boston, MA, USA, December 11-14, 2017*
- P39. "Incident analysis and prediction using clustering and Bayesian network" (2017). In: *2017 IEEE SmartWorld, San Francisco, CA, USA, August 4-8, 2017*
- P40. "Performance evaluation of smart systems under uncertainty" (2017). In: *2017 IEEE SmartWorld, San Francisco, CA, USA, August 4-8, 2017*
- P41. "Providing privacy, safety, and security in IoT-based transactive energy systems using distributed ledgers" (2017). In: *Seventh International Conference on the Internet of Things, IOT 2017, Linz, Austria, October 22-25, 2017*
- P42. "Transactive energy demo with RIAPS platform" (2017). In: *8th International Conference on Cyber-Physical Systems, ICCPS 2017, Pittsburgh, Pennsylvania, USA, April 18-20, 2017*
- P43. "A distributed and resilient platform for city-scale smart systems" (2016). In: *Conference presentation, IEEE/ACM Symposium on Edge Computing (SEC)*
- P44. "Towards Reliability-Based Decision Making in Cyber-Physical Systems" (2016). In: *2016 IEEE International Conference on Smart Computing, SMARTCOMP 2016, St Louis, MO, USA, May 18-20, 2016*
- P45. "The Role of Context and Resilient Middleware in Next Generation Smart Grids" (2016). In: *3rd Workshop on Middleware for Context-Aware Applications in the IoT, M4IoT@Middleware 2016, Trento, Italy*

- P46. "Smart City Hubs: Opportunities for Integrating and Studying Human CPS at Scale" (2015). In: *Workshop on Big Data Analytics in CPS: Enabling the Move from IoT to Real-Time Control*
- P47. "Challenges for Application Platforms for Integrated Cyber Physical Systems" (2015). In: *Workshop on Big Data Analytics in CPS: Enabling the Move from IoT to Real-Time Control*
- P48. "Transit Hub - An Extensible and Smart Decision Support System for Public Transportation" (2015). In: *CPS Principal Investigators Meeting*
- P49. "A Rapid Testing Framework for a Mobile Cloud" (2014). In: *25th IEEE International Symposium on Rapid System Prototyping, RSP 2014, New Delhi, India, October 16-17, 2014*
- P50. "An Information Architecture Platform for Mobile, Secure, and Resilient Distributed Systems" (2014). In: *High Confidence Software and Systems Conference*
- P51. "Using temporal causal models to isolate failures in Power System protection devices" (2014). In: *AUTOTESTCON*
- P52. "[Temporal causal diagrams for diagnosing failures in cyber-physical systems](#)" (2014). In:
- P53. "A Resilient and Secure Software Platform and Architecture for Distributed Spacecraft" (2014). In: *SPIE Defense, Security, and Sensing*
- P54. "A Deliberative Reasoner for Model-Based Software Health Management" (2012). In: *The Eighth International Conference on Autonomic and Autonomous Systems*
- P55. "RFDMon: A Real-time and Fault-tolerant Distributed System Monitoring Approach" (2012). In: *The Eighth International Conference on Autonomic and Autonomous Systems*
- P56. "A Software Platform for Fractionated Spacecraft" (Mar. 2012). In: *IEEE Aerospace Conference, 2012*. Big Sky, MT, USA
- P57. "[Model-based software health management for real-time systems](#)" (Mar. 2011). In: *Aerospace Conference, 2011 IEEE*
- P58. "[Application of Software Health Management Techniques](#)" (2011). In: *6th International Symposium on Software Engineering for Adaptive and Self-Managing Systems*. SEAMS '11. Waikiki, Honolulu, HI, USA
- P59. "[A Real-Time Component Framework: Experience with CCM and ARINC-653](#)" (2010). In: *IEEE International Symposium on Object-Oriented Real-Time Distributed Computing*. Los Alamitos, CA, USA
- P60. "[Integrated Monitoring and Control for Performance Management of Distributed Enterprise Systems](#)" (2010). In: *International Symposium on Modeling, Analysis, and Simulation of Computer Systems*. Los Alamitos, CA, USA
- P61. "Dynamic Workflow Management and Monitoring Using DDS" (Mar. 2010). In: *Engineering of Autonomic and Autonomous Systems (EASe), 2010 Seventh IEEE International Conference and Workshops on*

- P62. "Model Based Design" (2010). In: *Talk at Fermi National Laboratory*
- P63. "Distributed diagnosis of complex systems using timed failure propagation graph models" (2010). In: *AUTOTESTCON, 2010 IEEE*. IEEE
- P64. "Modeling and Analysis of Probabilistic Timed Systems" (2009). In: *IEEE International Conference on the Engineering of Computer-Based Systems*. Los Alamitos, CA, USA
- P65. "Compensating for Timing Jitter in Computing Systems with General-Purpose Operating Systems" (2009). In: *IEEE International Symposium on Object-Oriented Real-Time Distributed Computing*. Los Alamitos, CA, USA
- P66. "Using Runtime Verification to Design a Reliable Execution Framework for Scientific Workflows" (2009). In: *EASE '09: 2009 Sixth IEEE Conference and Workshops on Engineering of Autonomic and Autonomous Systems*. Washington, DC, USA
- P67. "Algorithms for Synthesizing Safe Sets of Operation for Embedded Systems" (2009). In: *ECBS '09: 2009 16th Annual IEEE International Conference and Workshop on the Engineering of Computer Based Systems*. Washington, DC, USA
- P68. "Reflex and Healing Architecture for Software Health Management" (July 2009). In: *International Workshop on Software Health Management, IEEE conference on Space Mission Challenges for Information Technology*
- P69. "Towards A Model-Based Autonomic Reliability Framework for Computing Clusters" (2008). In: *5th IEEE International Workshop on Engineering of Autonomic & Autonomous Systems (EASe)*
- P70. "Scientific Computing Autonomic Reliability Framework" (2008). In: *ESCIENCE '08: 2008 Fourth IEEE International Conference on eScience*. Washington, DC, USA
- P71. "Model Predictive Analysis for Autonomic Workflow Management in Large-scale Scientific Computing Environments" (2007). In: *4th IEEE International Workshop on Engineering of Autonomic & Autonomous Systems (EASe)*
- P72. "Verifying autonomic fault mitigation strategies in large scale real-time systems" (2006). In: *3rd IEEE International Workshop on Engineering of Autonomic & Autonomous Systems (EASe)*

Professional Societies

- Senior Member, IEEE
- Member, IEEE Power, and Energy Society
- Member, IEEE Intelligent Transportation Society
- IEEE Computer Society Special Technical Community on Blockchains
- IEEE Computer Society Special Technical Community on Smartgrid
- IEEE Computer Society Special Technical Community on Real-time Systems

- IEEE Technical Committee on Autonomous and Autonomic Systems.

Professional Service

Grant Review Experience

2014-2020 Participated in grant review panels for the NSF Smart and Connected Community (SCC), Civic Innovation Challenge, IIS Core, Big Data, and Cyber-physical System Programs. In addition, reviewed for DOE and NASA programs.

Editorial Experience

- 2019 Guest Editor: Special Issue of Journal of Systems and Software, ISORC 2018
- 2018 Guest Editor: Special Issue of Journal of Systems and Software, Elsevier on Adaptive Reflective Middleware
- 2013 Guest Editor: Special Issue on Software Health Management, Springer-Verlag
- 2016 International Workshop on Science of Smart City Operations and Platforms Engineering
- 2017 International Workshop on Science of Smart City Operations and Platforms Engineering

Conference and Workshop Organization

- 2021 Doctoral Symposium Chair Middleware 2021.
- 2021 Tutorial Chair SmartComp 2021.
- 2021 Workshop Program Chair DESTION 2021.
- 2021 Virtual Platforms Chair for CPSWeek 2021.
- 2020 Finance Chair of 22nd IEEE International Symposium On Real-Time Computing (ISORC)
- 2019 General Chair of 22nd IEEE International Symposium On Real-Time Computing (ISORC)
- 2019,2020 Program Co-chair of 4th IEEE Workshop on Big Data and IoT Security in Smart Computing at SmartComp conference.
- 2019 Organizer of challenges in Energy and Mobility Workshop at the Cyber-Physical Systems PI Meeting.
- 2020–2016 Chair - International Workshop on Science of Smart City Operations and Platforms Engineering at CPS Week
- 2018 Local organizer for Real-Time Systems and Symposium (RTSS)
- 2018 Program Chair of 21st IEEE International Symposium On Real-Time Computing (ISORC)
- 2018 Co-Chair - 1st International Workshop on Trustworthy and Real-Time Edge Computing for Cyber-Physical Systems (TREC4CPS)

- 2018 Program Chair of Smart and Connected Communities Workshop at International Conference on Distributed Computing and Networking.
- 2017 General Chair of the 16th Workshop on Adaptive and Reflective Middleware
- 2015 Chair, SPLC Conference, Tools and Demonstration Track

Technical Program Committees

- 2021 IEEE International Conference on Cloud Engineering (IC2E)
- 2021 DESTION - Design Automation for CPS and IoT
- 2021 DI-CPS - Data-Driven and Intelligent Cyber-Physical Systems
- 2021 IEEE International Conference on Blockchain and Cryptocurrency
- 2021 22nd ACM/IFIP International Conference for Middleware (Middleware 2021)
- 2021 Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI-21)
- 2020,2021 5th IEEE International Conference on Fog and Edge Computing 2021
- 2021 22nd International Conference on Distributed Computing and Networking (ICDCN 2021)
- 2020 1st Workshop on Blockchain for Network Resource Sharing (BlockNet 2020)
- 2020 7th International Workshop on Middleware and Applications for the Internet of Things (M4IoT 2020)
- 2020 COINS: IEEE International Conference on Omni-layer Intelligent systems
- 2020 IEEE Workshop on Assured Autonomy
- 2018,2019 Destion Workshop at CPS Week
- 2019 SmartComp
- 2017 Smart World Congress
- 2017 Fog World Congress
- 2016-2018 SmartSys Workshop at SmartComp Conference
- 2016-2018 ACM MMSys, special session on smart cities
- 2013-2020 Program committee member for International Symposium on Object-oriented Real-time Distributed Computing

- 2015 Program committee member for Workshop on Wild and Crazy Ideas on the interplay between IoT and Big Data
- 2015 Program committee member for 31st ACM/SIGAPP Symposium on Applied Computing, Reliable Software Technologies, and Communication Middleware Track
- 2012 Program Committee Member: 9th IEEE Workshop on Model-Based Development for Computer-Based Systems
- 2011 Co-Chair, Second International Workshop on Software Health Management
- 2011 Program committee member for 9th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing
- 2011 Program committee member for International Symposium on Object-oriented Real-time Distributed Computing

Journal Review Experience

- International Journal on Prognostics and Health Management
- IEEE Transactions on System Man and Cybernetics
- Future Generation Computer Systems
- IEEE Access
- IEEE Computer
- Elsevier Pervasive and Mobile Computing
- Innovations in System and Software
- IEEE Transactions on Smart Grid
- IEEE Transactions on Mobile Computing
- Journal on Cluster Computing
- ACM Transactions on Cyber Physical Systems
- Journal of Aerospace Computing, Information, and Communication
- Journal of Universal Computer Science
- IEEE Industrial Informatics
- Embedded System Letters
- Journal of Systems and Software - Elsevier

University Service

- 2016-2021 Supported and advised undergraduate researchers for the summer internship program

- 2020,2021 Faculty Search Committee Member for Civil and Environmental Engineering
- 2017-2021 Advisor to the computer science class of 2019, 2021, and 2022.
- 2020 VU Summer Research Program Review Committee
- 2018,2020 Offered the university course on data science for smart communities
- 2020 UPE Honors Society Faculty Advisor
- 2019 Goldwater Scholarship Review Committee
- 2019 Participated in 2U curriculum discussion.
- 2019 My research group participated along with the W'ondry at the OZ art museum family day held on August 19th, 2019.
- 2018,2019 Served in various MOVE-VU committees
- 2018 Organized Multimodal Mobility Workshop for interaction between community, industry, and academic partners. Details are available at <https://cps-vo.org/group/MultiModalMobility>
- 2018 Served in the Working Group on Energy and Natural Resources led by Prof. George Hornberger.
- 2017,2018 Presented review of smart community research at Intro to Engineering Lectures
- 2017,2018 Presented research talks during visits of Oakridge and ORAU researchers
- 2017 Participated in the mobility planning group in future VU to design a campus wayfinding system.
- 2017 Data Analytics for the Vanderbilt CMAQ Grant.
- 2017 Served as a member of the Bluesky Advisory Committee
- 2017 Served in the transit committee of Future VU
- 2017,2018 Presented Transit Related Projects at FutureVU meetings
- 2017 Presented review of smart community research at Intro to Engineering Lectures (2017)
- 2016 Directed undergraduate senior design project on smart home analytic.

Community Service

- 2017-2021 Led collaboration with Tennessee Department of Transportation for analyzing accidents and improving safety on roads.
- 2019-2021 Led collaboration with Metro Nashville for data management and data analytics of Scooter and accident data.

- 2020-2021 Led collaboration with Nashville WeGo and Chattanooga CARTA for managing service loads during the pandemic.
- 2019 My research group participated along with the W'ondry at the OZ art museum family day held on August 19th, 2019.
- 2018 Organized [Multimodal Mobility Workshop](#) for interaction between community, industry, and academic partners.
- 2018 Led the Air Quality Assessment Project in collaboration with the Greater Nashville Regional Council (GNRC).
- 2017-2018 Led the Gulch Traffic Density Assessment Project in collaboration with Planning Department.
- 2017-2018 Led collaboration with the Nashville Mayor's office and the Nashville Technology Council on Blockchain initiatives in the metropolitan area.
- 2017 Led collaboration with the Open Data initiative at the Metro Information Technology Services (ITS).
- 2015-2017 Led Nashville projects at the Global Cities Team Challenge organized by the National Institute of Standards and Technology (NIST). The projects included collaborative work with Nashville Metropolitan Transit Authority (MTA) and Nashville Fire Department.
- 2018 Participated in the TennSmart program.
- 2018 Study of the Transit Hub platform for Chattanooga Area Regional Transit Authority.
- 2016-2017 Chair of Connected Nashville Technology Standards Committee convened by Mayor.
- 2016 Helped develop the Nashville application for the Department of Transportation Challenge.