

SAFER-SIM Accomplishments

October 1, 2020 – March 31, 2021

1. Accomplishments

1.1 Research Accomplishments

1.1.1 Peer-reviewed journal publications

Published

1. H. Nassereddine, K. R. Santiago-Chaparro, and D. A. Noyce, “Modeling Vehicle Pedestrian Interactions Using a Non-Probabilistic Regression Approach,” *Transportation Research Record*, 2020.
<https://doi.org/10.1177%2F0361198120962799>
2. Yingxue Zhang, Yanhua Li, Xun Zhou Xiangnan Kong, Jun Luo. Off-Deployment Traffic Estimation --- A Traffic Generative Adversarial Networks Approach. *IEEE Transactions on Big Data*
<https://doi.ieeecomputersociety.org/10.1109/TBDATA.2020.3014511>
3. Rahman, M. H., Abdel-Aty, M. Application of Connected and Automated Vehicles in a Large-Scale Network by Considering V2V and V2I Technology’ accepted at *Transportation Research Record (TRR)*, 2020.
<https://doi.org/10.1177%2F0361198120963105>
4. Elmquist, R. Serban, D. Negrut, “A Sensor Simulation Framework for Training and Testing Robots and Autonomous Vehicles,” *ASME Journal of Autonomous Vehicles*, 2021. <https://doi.org/10.1115/1.4050080>.
5. K. Liu, D. Negrut, “The role of physics-based simulators in robotics,” *Annual Review of Control, Robotics, and Autonomous Systems*, Vol. 4, 2021,
<https://doi.org/10.1146/annurev-control-072220-093055>.
6. H. Choi, C. A. Crump, C. Duriez, A. Elmquist, G. D. Hager, D. Han, F. J. Hearl, J. Hodgins, A. Jain, F. A. Leve, C. Li, F. Meier, D. Negrut, L. Righetti, A. Rodriguez, J. Tan, J. Trinkle, “On the use of modeling and simulation in robotics: opportunities and challenges,” *Proceeding of the National Academy of Sciences*, 2021
<https://doi.org/10.1073/pnas.1907856118>.
7. Song, Y., Chitturi, M.V. and Noyce, D.A., 2021. “Automated vehicle crash sequences: Patterns and potential uses in safety testing.” *Accident Analysis & Prevention*, 153, p.106017. <https://doi.org/10.1016/j.aap.2021.106017>
8. Benjamín Colucci, Didier Valdés, and Alberto M. Figueroa-Medina. 2021. “Innovative Research that Contributes to Safety, Sustainability, and Resilience in Transportation Systems.” Paper published *International Journal of Natural Disasters, Accidents, and Civil Infrastructure (Revista Internacional de Desastres Naturales, Accidentes e Infraestructura Civil, RIDNAIC)*, Vol. 19-20, #13, pp. 211-229.
https://www.scipedia.com/public/Colucci_et_al_2021a
9. Pradhan, A. K., Pai, G., Radadiya, J., Knodler Jr, M. A., Fitzpatrick, C., & Horrey, W. J. (2020). Proposed Framework for Identifying and Predicting Operator Errors When using Advanced Vehicle Technologies. *Transportation Research Record: Journal of the Transportation Research Board*. <https://doi.org/10.1177%2F0361198120938778>
10. Jiang, Y., O’Neal, E. E., Zhou, S., Plumert, J. M., & Kearney, J. K. (2020). Crossing

Roads with a Computer-generated Agent: Persistent Effects on Perception–Action Tuning. ACM Transactions on Applied Perception (TAP), 18(1), 1-16.
<https://doi.org/10.1145/3431923>

Accepted for publication

1. B. Claros. “Impact of Geometry and Operations on Left Turn Gap Acceptance at Signalized Intersections with Permissive Indication” Transportation Research Record.
2. Parr, M. N., Tang, H., Mallaro, S., Kearney, J., & Plumert, J. M. (in press). Associations between inattention/hyperactivity and performance on simple and complex timing tasks. Journal of Pediatric Psychology.
3. Guo, Z., Afifah, F.*, Qi, J, and Baghali, S.*(2020, accepted), A Stochastic Multi-Agent Optimization Framework for Interdependent Transportation and Power System Analyses. IEEE Transactions on Transportation Electrification

Submitted

1. A. Fallahdizchah and C. Wang, "Profile monitoring based on transfer learning of multi-profile with incomplete samples," IISE Transactions, under review, 2021.
2. D. McGehee, C. Roe, P, Kasarla and C. Wang, “Quantifying and recommending seat belt reminder timing using naturalistic driving video data”, Journal of Safety Research, under review, 2021.
3. Subramanian, L.D., O’Neal, E.E., Roman, A., Sherony, R., Plumert, J.M., & Kearney, J.K. (Revised manuscript under review). How Do Pedestrians Respond to Adaptive Headlamp Systems in Vehicles? A Road-Crossing Study in an Immersive Virtual Environment. Accident Analysis & Prevention.
4. O’Neal, E. E., Rahimian, P., Jiang, Y., Zhou, S., Nikolas, M., Kearney, J. K., & Kearney, J. M. (under review). Parent-Child Joint Road Crossing in a Virtual Environment: When does the Scaffolding Process Go Awry? Journal of Pediatric Psychology.

1.1.2 Book chapters

Nothing to report

1.1.3 Edited books

Nothing to report

1.1.4 Conference papers, posters, and symposia

Presented

1. Baghali, S.* and Guo, Z. (2021, Best Paper Award) Investigating the Effects of Privately Owned Electrical Vehicles on Distribution System Resilience. Presentation

- at the IISE Annual Conference, Online
2. Siddique, N., Afifah, F.*, Guo, Z. and Zhou, Y. (2021) Predictive Modeling for PEV Charging Behavior using Large-scale Charging Data. Presentation at the Transportation Research Board 100th Annual Meeting, Online
 3. Guo, Z., Afifah, F.*, and Qi, J. (2021) A Decomposition-based Approach for Transportation and Power Systems Interdependence with Renewable Generators and Electric Vehicles. Presentation at the Transportation Research Board 100th Annual Meeting, Online.
 4. Chuang, H*, Guo, Z., Aeschliman, S., Zhou, Y., Afifah, F.*, and Huang, J.(2021). Energy Impact Analyses of Electrified Ride-sourcing Services without Trip-chain Data. Presentation at the Transportation Research Board 100th Annual Meeting, Online
 5. Rahman, R., Bhowmik, T., Eluru, N., and Hasan, S. (2021) Assessing the Crash Risks of Evacuation: A Matched Case-Control Approach Applied over Data Collected during Hurricane Irma, TRB Annual Meeting 2021, D.C. Washington.
 6. Malik, J., Di Napoli Parr, M., Flathau, J., Tang, H., Kearney, J.K., Plumert, J.M., Rector, K.K. (in press). Determining the Effect of Smartphone Alerts and Warnings on Street-Crossing Behavior in Non-Mobility-Impaired Older and Younger Adults. ACM CHI: Conference on Human Factors in Computing Systems, 2021.
 7. O'Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). How does parent gender impact the socialization of safety values in sons and daughters? Oral presentation accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
 8. Parr, M., Zhou, S., O'Neal, E.E., Kearney, J.K., & Plumert, J.M. (April, 2021). How do Children Perceive and Act on Affordances When Walking vs Bicycling Across Roads? Poster accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
 9. Kim, A., O'Neal, E.E., Flathau, J., Tang, H., Kearney, J.K., & Plumert, J.M. (April, 2021). A parent-based intervention program for training prospective control skills in children. Poster accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
 10. Subramanian, L. D., O'Neal, E.E., Plumert, J. M., & Kearney, J. K. (March 19, 2021) A Study of Pedestrian Road Crossing in the Presence of eHMI using an Immersive Virtual Environment, Poster Presentation, SAFER-SIM UTC Symposium.
 11. O'Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). Socialization of safety values in children: The role of parent and child gender. Oral presentation accepted for presentation at the 2021 annual meeting of the Society for Violence and Injury Research , Virtual Conference.
 12. Saisubramanian, S., Roberts, S. C., Zilberstein, Z. (in press). Understanding User Attitudes Towards Negative Side Effects of AI Systems. In CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 Extended Abstracts). ACM Press.
 13. Radadiya, Pai, Pradhan (2020) Are Limitations of Advanced Vehicle Technologies Described Consistently for Different Vehicle Models: An Examination for Adaptive

Cruise Control, Annual Meeting of the Association for the Advancement of Automotive Medicine.

14. Ryan, A., Hennessy, E., Fitzpatrick, C., Knodler, M., and Ai, C. (2021) Driver performance at horizontal curves: A review of current simulation literature and research gaps. Poster. Safety Research Using Simulation (SAFER-SIM) Conference, 11–12 & 18–19 March, online format.
15. J. Taves, A. Young, S. Benatti, A. Elmquist, R. Serban, A. Tasora, D. Negrut, “SynChrono: An MPI-Based, Scalable Physics-Based Simulation Framework for Autonomous Vehicles Operating in Off-Road Conditions,” International Conference for High Performance Computing, Networking, Storage, and Analysis, 2020. Poster can be found [here](#).
16. J. Taves, A. Young, S. Benatti, A. Elmquist, R. Serban, D. Negrut, “A Scalable Physics-Based Simulation Framework for Autonomous Vehicles in Chrono,” SAFER-SIM Symposium, 2021
17. J. Taves, A. Elmquist, A. Young, R. Serban and D. Negrut, “SynChrono: A Scalable, Physics-Based Simulation Platform For Testing Groups of Autonomous Vehicles and/or Robots,” International Conference on Intelligent Robotic Systems, 2021. Paper can be found [here](#).
18. B. Claros. “Impact of Geometry and Operations on Left Turn Gap Acceptance at Signalized Intersections with Permissive Indication” Transportation Research Board Annual Meeting, 2021.
19. Didier Valdés, Benjamín Colucci, Alberto Figueroa-Medina, Yindhira Taveras, and Andrés Chamorro. Use of Driving and Virtual Reality Simulation Technologies to Visualize Transportation Safety Innovations. 100th Annual Meeting of the Transportation Research Board, Visualization Lighting Talks Lectern Session 1420, Standing Committee on Visualization in Transportation (AED-80), January 29, 2021.
20. Alberto Figueroa-Medina. Study of Gap Acceptance and Walking Speed of Pedestrians using Virtual Reality Simulation. 1st Virtual Congress of Traumatic Brain Injury. Graduate School of Rehabilitation Counseling, University of Puerto Rico at Río Piedras, March 5, 2021.
21. Alberto Figueroa-Medina. Innovative Research Contributing to Safety, Sustainability and Resilience in Transportation Systems. 1st Virtual Summit RIDNAIC. March 16, 2021.
22. Didier Valdés, Benjamín Colucci, Alberto Figueroa-Medina, Yindhira Taveras, María Rojas, Rocío Sotomayor-Irizarry, C. Lorena Sierra. January 2021. Safety Enhancements to Reduce Speeding in School Zones using Driving Simulation. Transportation Research Board 100th Annual Meeting. Washington, D.C..
23. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. March 2021. Study of Gap Acceptance and Walking Speeds of Pedestrians using Virtual Reality Simulation. Poster at SAFER-SIM Symposium 2021.
24. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. March 2021. Impact of Road Information Assistive Systems on Pedestrian Crossing Safety. Poster at SAFER-SIM Symposium 2021.

Accepted/Not yet presented

1. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. September 2021. Pedestrian Walking speeds and Success Rates on Mid-Block Crossing Using Virtual Reality Simulation. Abstract accepted for Road Safety and Simulation Conference 2021.
2. Carla Lopez, Didier Valdés, Alberto Figueroa, and Benjamín Colucci. Driver's Compliance in Work Zones: Two-Lane Rural Roads -vs.- Freeways. 2021 International LADR Workshop. Original manuscript was accepted on January 30, 2021.
3. Ryan, A., Ai, C., Fitzpatrick, C., and Knodler, M. (accepted) Identifying safety-critical road segments and potential countermeasures: A geospatial approach using horizontal curve data. To present at the Institute of Transportation Engineers Annual Meeting, 18–21 July, Portland, OR.
4. Ryan, A., Hennessy, E., Ai, C., Fitzpatrick, C., and Knodler, M. (accepted abstract, paper submission forthcoming) Driver performance at horizontal curves: Bridging critical research gaps to increase safety. Paper Number 7. Road Safety & Simulation International Conference, 22–24 September, Athens, Greece.

Submitted

Nothing to report

1.1.5 Paper/poster awards

1. Martin Bruening Award - Any member of the Wisconsin Section of the Institute of Transportation Engineers or its student chapters may submit a candidate technical paper. The paper must result from a study or design project in the field of transportation or traffic engineering in which the author(s) served as a principal participant.
Paper title: “Impact of Geometry and Operations on Left Turn Gap Acceptance at Signalized Intersections with Permissive Indication” stemming from [this project](#).
2. Best paper award from [this UCF project](#), “Impacts of Privately Owned Electrical Vehicles on Power Distribution System Resilience”, Energy Systems Track, Institute of Industrial and Systems Engineers Annual Conference

1.1.6 External grants related to SAFER-SIM

Awarded

1. “CAREER: Dynamic Virtual Reality Experiences for People with Visual Impairments”
National Science Foundation,
Kyle Rector (PI), University of Iowa
Aug 2021 – Jul 2026
\$550,000

Submitted

1. Drawing on the SAFER-SIM work, Negrut participated into a \$2.5 million NSF proposal on the topic of autonomous long-haul trucking. The proposal is under NSF review as of March 2021.
2. Shannon Roberts submitted a proposal that uses knowledge gained from a Safer-Sim project:

NSF INCLUDES Alliance: Coalition for Science, Technology, and Engineering for People (CoSTEP) Integrating Diversity for Excellence around STEM (IDEAS), National Science Foundation, \$7,845,000, 07/01/2021-06/30/2026, co-PI.

This proposal seeks to increase the number of black, indigenous, and people of color students who obtain engineering degrees. Through the proposal, Prof. Roberts will work with undergraduate students on automated vehicle research projects that are similar to this SaferSim project (e.g., understand how drivers respond to automated vehicle technology).
3. Shannon Roberts submitted a proposal that uses knowledge gained from a Safer-Sim project:

FW-HTF-R: Reimagining the Future of Equitable Work for Truckers in a Highly Automated World, National Science Foundation, \$2,500,000, 09/01/2021-08/31/2025, PI.

This proposal seeks to understand how driving automation systems will change the work of truck driving and how we can better prepare truck drivers for this shift with appropriate vehicle design. Through the proposal, Prof. Roberts will investigate how the technology is introduced into the truck along with how truckers perceive the technology and how it can be improved. The experimental methods and data collection procedures of this SaferSim project will inform the research proposal.
4. Eleni Christofa - NCHRP Proposal Project Number 17-97: Strategies to Improve Pedestrian Safety at Night
5. “How Do Children with and without Developmental Coordination Disorder Synchronize Self and Object Movement?”

Submitted to National Institutes of Health. Percent effort: 1. Investigator(s) Jodie Plumert (PI), Joseph K. Kearney (Co-I), Kyle Rector (Co-I), Elizabeth M. O’Neal (Co-I), Cynthia L. Huang-Pollock (Consultant), Lane Strathearn (Other Significant Contributor).

Sep 2021 – Aug 2026
Iowa portion: \$2,783,740.
6. UCF – Samiul Hasan
Agency: NSF
Program: EAGER: Strengthening American Infrastructure
Proposal title: EAGER: SAI: Exploring Pathways of Adaptive Infrastructure Management with Rapidly Intensifying Hurricanes

1.2 Leadership Development Accomplishments

1.2.1 *Invited presentations*

1. Abdel-Aty, Mohamed. Safety Management and Visualization: Real-Time data, Safety Analytics and AI, Metropolitan Transport Commission 2020 On-Line International Seminar, Seoul, Korea, Dec. 15, 2020.
2. Abdel-Aty, Mohamed. Addressing Traffic Operation and Safety Challenges using Active Traffic Management Technology, Federation of Arab Engineers Virtual Conference, Dec. 2020.
3. Gaussian Process based modeling, monitoring and knowledge transfer in engineering applications, Washington, D.C., USA, Nov. 2020 (held online due to COVID-19), INFORMS Annual Meeting
4. Kearney, J.K., Using Virtual Reality to Study Human Perception and Action, University of Iowa IEEE chapter Tuesday, March 9, 2021.
5. Shannon Roberts gave a presentation entitled “Using Text Mining to Uncover Drivers’ Perception of Baseline Driver Assistance Systems” during the SAE Government/Industry Digital Summit on February 2.
6. Didier Valdés, Benjamín Colucci, and Alberto Figueroa-Medina. Success Stories on Technology Transfer: UPRM Experience. Virtual SAFER-SIM Symposium, March 19, 2021.
7. Both Shannon Roberts and Jennifer McDermott presented during the New Hampshire Traffic Safety Series Teen Driver Panel entitled “ADHD and Teen Driving” on December 2
8. Wisconsin Automated Vehicle External Committee - Update on Wisconsin CAV (September 8, 2020)

1.2.2 *Invited papers*

Nothing to report

1.2.3 *Invited workshops*

Nothing to report

1.2.4 *Grant review panels*

1. Shannon Roberts completed her duties to serve on a BTSCR panel for BTS-01: Guidance for Employer-Based Behavioral Traffic Safety Programs for Drivers in the Workplace. For the panel, she provided guidance for the contractor in terms of how drivers will respond to traffic safety programs.
2. Alberto Figueroa-Medina. Member of Oversight Panel for NCHRP project 07-29: Development of the 8th edition of the AASHTO’s A Policy on Geometric Design of Highways and Streets (Green Book). National Cooperative Highway Research Program, Transportation Research Board
3. Guo - Panelist for NSF Civil Infrastructure Systems review panel (Feb. 2021)

1.2.5 *Advisory committees*

1. Dr. Mohamed Abdel-Aty: Transportation Research Board, National Research Council, National Academy of Sciences
2. Dr. Mohamed Abdel-Aty: Member, Committee on Safety Performance and Analysis (ACS20) – MEMBER (2014- 2021)
3. Dr. Mohamed Abdel-Aty: Member, Committee on Human Factors of Infrastructure Design and Operations (ACH40) – MEMBER (1998 – 2002, 2004 –2011 and 2014-2021)
4. Dr. Mohamed Abdel-Aty: Co-Chair, ASCE Transportation Safety Committee, Nov. 2017-ongoing
5. Dr. Mohamed Abdel-Aty: Member, World Conference on Transport Research Society – WCTRS (2004 – ongoing)
6. Dr. Mohamed Abdel-Aty: Member, Editorial Board, ITS Journal, Taylor & Francis (2003 – ongoing)
7. Dr. Mohamed Abdel-Aty: Member, Editorial Board, International Journal of Sustainable Transportation, Taylor & Francis (2013 – ongoing).
8. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Analytic Methods in Accident Research (AMAR) (2019- ongoing)
9. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Transportation Research Part C (2019- ongoing)
10. Dr. Mohamed Abdel-Aty: ITF Roundtable on Artificial Intelligence in Road Traffic Crash Prevention, OECD, Feb. 10-12, 2021
11. Dr. Mohamed Abdel-Aty: Member International Road Federation Group of Experts on Road Safety (2011-ongoing)
12. Dr. Mohamed Abdel-Aty: Member, American Society for Engineering Education – ASEE (2002-2004 and 2010 - ongoing)
13. Dr. Yina Wu: Member, TRB Committee on Surface Transportation Weather (AH010) (2020 – ongoing)
14. Dr. Chris Schwarz: TRB committee on vehicle automation
15. Dr. Chris Schwarz: SAE On Road Automated Driving Simulation Task Force
16. Michelle Reyes: UI Injury Prevention Research Center Executive Committee
17. Michelle Reyes: UI Great Plains Center for Agricultural Health Internal Advisory Committee
18. Michelle Reyes: Transportation Research Board of the National Academies: Standing Committee on Vehicle User Education, Training, and Licensing; and Young Driver Subcommittee, Member
19. Michelle Reyes: Engineering Staff Advisory Council
20. Jacob Heiden: Engineering Staff Advisory Council, President
21. Dawn Marshall: Engineering Staff Advisory Council
22. Dawn Marshall: ACH40 Human Factors of Infrastructure Design and Operations
23. Dawn Marshall: ACH40 Joint Subcommittee on Human Factors of In-Vehicle Systems (with ACH30)
24. Kyle Rector: Iowa Department of Education, Computer Science Work Group, Member and leading “CS
25. Kyle Rector: Education Underserved” subcommittee
26. Eleni Christofa: TRR Editorial Board Task Force

27. Eleni Christofa: TRB AME70 Transportation and Public Health Committee Member
28. Shannon Roberts: Center for Research on Families Steering Committee.
29. Didier Valdés: Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board.
30. Benjamín Colucci: Applied Human Factors and Ergonomics (AHFE 2017-present) Scientific Advisory Board.
31. Benjamín Colucci: Member TRB Committee AHB55 Work Zone Traffic Control.
32. Benjamín Colucci: Member Best Paper Award TRB Committee AHB55 Work Zone Traffic Control.
33. Benjamín Colucci: Member of the Advisory Committee of the Puerto Rico - State Transportation Innovation Council (STIC).
34. Benjamín Colucci: Member of the Advisory Committee of the US Virgin Islands - State Transportation Innovation Council (STIC).
35. Benjamín Colucci: 2020 Latin American and Caribbean Consortium of Engineering Institution (LACCEI) International Multi-Conference for Engineering, Education, and Technology Scientific Advisory Board.
36. Benjamín Colucci: Transportation Research Board Representative of University of Puerto Rico at Mayaguez, 1985 - Present.
37. Benjamín Colucci: Friend, TRB Standing Committee AKC60 Asphalt Pavement Construction and Rehabilitation, 2020 - Present.
38. Benjamín Colucci: Friend, TRB Standing Committee ACH40 Human Factors of Infrastructure Design and Operations, 2020 - Present.
39. Benjamín Colucci: Friend, TRB Standing Committee AKP10 Pavement Condition Evaluation, 2020 - Present.
40. Benjamín Colucci: Friend, TRB Standing Committee AKT30 Pavement Maintenance, 2020 - Present.
41. Benjamín Colucci: Friend, TRB Standing Committee AKT10 Pavement Management Systems, 2020 - Present.
42. Benjamín Colucci: Friend, TRB Standing Committee AKT20 Pavement Preservation, 2020 - Present.
43. Benjamín Colucci: Friend, TRB Standing Committee ACH10 Pedestrians, 2020 - Present.
44. Benjamín Colucci: Friend, TRB Standing Committee AJE35 Research Innovation Implementation Management, 2020 - Present.
45. Benjamín Colucci: Member, TRB Standing Committee ACH50 Road User Measurement and Evaluation, 2020 - Present.
46. Benjamín Colucci: Friend, TRB Standing Committee ACS20 Safety Performance and Analysis, 2020 - Present.
47. Benjamín Colucci: Member, TRB Standing Committee ACP55 Traffic Control Devices, 2020 - Present.
48. Benjamín Colucci: Friend, TRB Standing Committee AJE30 Transportation Asset Management, 2020 - Present.
49. Benjamín Colucci: Friend, TRB Standing Committee ACS10 Transportation Safety Management Systems, 2020 - Present.
50. Benjamín Colucci: Friend, TRB Standing Committee AJE15 Workforce Development and Organizational Excellence, 2020 - Present.

51. Benjamín Colucci: Co-Chair of the Traffic Enforcement Committee, International Road Federation (IRF).
52. Benjamín Colucci: Co-Chair Vision Zero Conference in Latin America Steering Committee, International Road Federation (IRF).
53. Benjamín Colucci: Member, Transportation Forensics and Risk Management (T-FARM), Institute of Transportation Engineers (ITE), 2018 – Present.
54. Benjamín Colucci: Member, Transportation Education Council, Institute of Transportation Engineers (ITE), 2017 – Present.
55. Benjamín Colucci: Member, Transportation Safety Council, Institute of Transportation Engineers (ITE), 2019 – Present.
56. Benjamin Colucci: Member of the Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). January 2020 - Present.
57. Benjamin Colucci: American Association of State Highways and Transportation Officials (AASHTO) Co-Liaison representing the National Local Technical Assistance Program Association (NLTAPA). August 2019 - Present.
58. Benjamin Colucci: Partnership Workgroup, representing the National Local Technical Assistance Program Association (NLTAPA). July 2018 - Present.
59. Benjamin Colucci: Safety Workgroup representing the National Local Technical Assistance
60. Benjamin Colucci: Innovation, and Implementation Workgroup representing the National Local Technical Assistance Program Association (NLTAPA). July 2018 - Present.
61. Benjamin Colucci: Strategic Highway Safety Plan (SHSP) - Puerto Rico, stakeholder representing Puerto Rico LTAP - T2; Traffic Incident Management (TIM) workgroup, 2013 - Present.
62. Benjamin Colucci: President of Transportation and Mobility Commission College of Engineers and Surveyors of Puerto Rico (CIAPR) August 2020 - Present.
63. Benjamin Colucci: President of Highway and Transportation Task Force, American Society of Civil Engineers (ASCE) - Puerto Rico Section, June 2020 - Present.
64. Benjamín Colucci: American Public Works Association (APWA) representing the Puerto Rico Local Technical Assistance Program (LTAP) Center. June 1, 2020-May 31, 2021.
65. Benjamín Colucci: Puerto Rican Academy of Engineering (APrI) Founding Member 2010 - Present.
66. Alberto M. Figueroa-Medina: Standing Committee on Performance Effects of Geometric Design AKD-10 (formerly known as Operational Effects of Geometrics AHB-65), Transportation Research Board, 2013-Present.
67. Alberto M. Figueroa-Medina: Transportation Education Council, Institute of Transportation Engineers (ITE).
68. Alberto M. Figueroa-Medina: Transportation Safety Council, Institute of Transportation Engineers (ITE).
69. Alberto M. Figueroa-Medina: Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). Nov. 2019 - Present.
70. Alberto M. Figueroa-Medina: Technical Committee of the Pan American Federation

of Engineers Societies (UPADI), 2020-Present.

71. Jon Riehl: Wisconsin Automated Vehicle External Committee
72. Jon Riehl: MMITSS (Multi-Modal Intelligent Traffic Signal Systems) in Madison
73. Jon Riehl: Park Street Connected Corridor Group
74. David Noyce: Wisconsin ACES (Automated Connected Electric Shared)
75. David A. Noyce: Board of Governors (elected), Vice President 2020-2021, President 2021-2022. Transportation & Development Institute, American Society of Civil Engineers.
76. David A. Noyce: Mentor, Chancellor's Scholarship Program, Merit-Based Scholarships for Undergraduate Students from Underrepresented Groups. University of Wisconsin-Madison.
77. David A. Noyce: Chair, Associate Dean for Research Search & Screen Committee. College of Engineering, University of Wisconsin-Madison.
78. David A. Noyce: Member, Undergraduate Student Progression Committee. College of Engineering, University of Wisconsin-Madison.
79. David A. Noyce: Member, Dean's Leadership Council. College of Engineering, University of Wisconsin-Madison
80. Kelvin Santiago: City of Sun Prairie Public Works Committee

1.2.6 Journal editing

1. Mohamed Zaki: TRR Handling Editor
2. Samiul Hasan: Associate Editor, ASCE Natural Hazards Review
3. Samiul Hasan: Associate Editor, Frontiers in Built Environment
4. Samiul Hasan: Associate Editor, Highway Transportation System Security and Emergency Response, Journal of Transportation Safety and Security (JTSS)
5. Michelle Reyes: Accident Analysis and Prevention (reviewer)
6. Kyle Rector: ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) (Associate Editor)
7. Kyle Rector: ACM Transactions on Accessible Computing (TACCESS) (Reviewer)
8. Kyle Rector: Journal of Medical Internet Research (JMIR) (Reviewer)
9. Eleni Christofa: Handling Editor, Transportation Research Record
10. Eleni Christofa: Associate Editor for the 24th IEEE International Conference on Intelligent Transportation Systems.
11. Anuj K. Pradhan: Transportation Research Record – Editorial Board
12. Anuj K. Pradhan: Frontiers in Neuroergonomics – Editorial Board
13. Anuj K. Pradhan: Journal of Law and Mobility – Contributing Editor
14. Didier Valdés: Applied Human Factors and Ergonomics (AHFE), Scientific Advisory Board, 2017-Present.
15. Didier Valdés: 18th LACCEI International Multi-Conference for Engineering, Education, and Technology.
16. Didier Valdés: 100th TRB Annual Meeting, January 2021, Washington DC.
17. Didier Valdés: Editorial Board Member of International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, August 2020 - Present.
18. Benjamín Colucci: Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board.
19. Benjamín Colucci: President Editorial Board of International Journal of Natural

- Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, February 2020 - Present.
20. Benjamín Colucci: Editor of Dimension Journal, College of Engineers and Surveyors of Puerto Rico (CIAPR), September 2019 - Present.
 21. Benjamín Colucci: 100th Transportation Research Board (TRB) Annual Meeting, January 2021, Washington, DC.
 22. Benjamín Colucci: Member, TRB Committee AHB55 Work Zone Traffic Control; 2017-2020
 23. Benjamín Colucci: Member Best Paper Award TRB Committee AHB55 Work one Traffic Control.
 24. Benjamín Colucci: Member, TRB Standing Committee AND30 Simulation and Measurements of Vehicle and Operator Performance, 2019-2022.
 25. Benjamín Colucci: Member: TRB Standing Committee on Road User Measurement and Evaluation (ACH50); 2020-2022.
 26. Benjamín Colucci: Member: TRB Standing Committee on Traffic Control Devices (ACP55); 2020.
 27. Alberto M. Figueroa-Medina: 100th Transportation Research Board (TRB) Annual Meeting, January 2021, Washington, DC.
 28. Alberto M. Figueroa-Medina: Transportation Research Record, TRB Journal.
 29. Alberto M. Figueroa-Medina, Accident Analysis and Prevention Journal, Elsevier.
 30. Alberto M. Figueroa-Medina, Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, 2019 - Present.
 31. Alberto M. Figueroa-Medina, International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, September 2020 - Present.
 32. Alberto M. Figueroa-Medina, 6th International Symposium on Highway Geometric Design, Transportation Research Board, Amsterdam, June 23-26, 2021.
 33. Alberto M. Figueroa-Medina, 6th Urban Street Symposium, Transportation Research Board, Amsterdam, June 23-26, 2021.
 34. David A. Noyce: Journal of Transportation Engineering (ASCE). Associate Editor.
 35. David A. Noyce: International Journal on Sustainable Transportation. Editorial Board.
 36. David A. Noyce: Accident Analysis and Prevention Journal. Editorial Board.

1.2.7 Leadership positions in professional organizations

1. Dr. Mohamed Abdel-Aty: Chair, Department of Civil, Environmental, & Construction Engineering at the University of Central Florida
2. Michelle Reyes: Transportation Research Board of the National Academies: Standing Committee on Vehicle User Education, Training, and Licensing; and Young Driver Subcommittee, Member
3. Joe Kearney: Editorial Board, Driving Simulation Conference
4. Kyle Rector: 2021 ACM SIGACCESS Conference on Computers and Accessibility, Program Committee
5. Kyle Rector: 2021 ACM CHI Conference on Human Factors in Computing Systems, Program Committee
6. Kyle Rector: 2022 ACM SIGACCESS Conference on Computers and Accessibility, Organizing Committee
7. Eleni Christofa: TRB ACP25 Traffic Signal Systems Committee Member and Paper

Review Coordinator

8. Anuj K. Pradhan: TRB Committee on Vehicle User Education, Training, and Licensing – Paper Coordinator
9. Anuj K. Pradhan: AutoUI 2020 – Work in Progress Committee Co-chair
10. Anuj K. Pradhan: Association for the Advancement of Automotive Medicine – Chair of Automated Vehicles Special Interest Group
11. Didier Valdés: Technical Committee, Pan American Federation of Engineering Associations (UPADI), 2020-Present.
12. Benjamín Colucci: Member, Board of Directors of the Pan-American Academy of Engineering (PAE), 2018-2020.
13. Benjamín Colucci: Member Board of Trustees of the Society of Engineers of Puerto Rico (SIPR), Scholarship Committee 2019 - Present.
14. Benjamín Colucci: President of the Pan-American Transport Systems Committee, Pan-American Federation of Engineering Associations (UPADI), 2017-2020.
15. Benjamín Colucci: Vice-President of the International Society for Maintenance and Rehabilitation of Transport Infrastructures (ISMARTI).
16. Benjamin Colucci: Editorial Commission, Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, Member of Editorial Commission, 2019 - Present.
17. Benjamin Colucci: Director of Abertis Chair in Puerto Rico.
18. Benjamin Colucci: UPRM Program Manager of Dwight David Eisenhower Transportation Fellowship Program (DDETFP), 2010 - Present.
19. Alberto M. Figueroa-Medina: Editorial Commission, Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, 2019 - Present.
20. Alberto M. Figueroa-Medina: Pan-American Transport Systems Technical Committee, Pan-American Federation of Engineering Associations (UPADI), 2020-Present.

1.2.8 SAFER-SIM Webinars

Webinar	Date	Registrants	Archived Views
The Impact of Driver’s Mental Models of Advanced Vehicle Technologies on Safety and Performance	10/27/2020	30	54
Using Simulation to Assess Right-Hook Conflicts Between Bicycles and Cars at Protected and Unprotected Intersections	11/10/2020	43	72
Assessing a Two-Step Posted Speed Reduction as a Potential Countermeasure to Improve Safety in School Zones Using Driving Simulation	2/23/2021	22	18
Study of Gap Acceptance and Walking Speeds of Pedestrians using Virtual Reality Simulation	3/9/2021	58	75

Drivers' Safety Assessment in Two Lane Rural Road Work Zones	3/24/2021	21	22
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1.2.9 Professional awards

1. Dr. Mohamed Abdel-Aty: Distinguished Service to Safety Award, NSC Distinguished Service to Safety Award, the most prestigious award given to individuals by the National Safety Council, 2020.
2. Dr. Mohamed Abdel-Aty: Roy W. Crum Distinguished Service Award, Transportation Research Board, The National Academies, 2020.
3. Dr. Mohamed Abdel-Aty: Elected member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL). Inducted November 2020.
4. Dr. Mohamed Abdel-Aty: Publons Web-of-Science, Highly Cited Researcher, Clarivate™ identifies the world's most influential researchers — the select few who have been most frequently cited by their peers over the last decade. In 2020, fewer than 6,200, or about 0.1%, of the world's researchers, in 21 research fields and across multiple fields, have earned this exclusive distinction, November 2020.
5. Benjamín Colucci Ríos: 2021 Wilbur S. Smith Award
Given by the American Society of Civil Engineers (ASCE) and its Transportation Development Institute for "unending leadership and dedication to action for the improvement of road safety in Puerto Rico and around the world".
6. Benjamín Colucci Ríos: American Society of Engineer - Puerto Rico Section for his designation of the 2021 Wilbur S. Smith Award given by National ASCE and declared as a distinguished member of ASCE - Puerto Rico March 20, 2021.
7. Dr. Didier M. Valdés: 2019-2020 Outstanding Professor from the Civil Engineering and Surveying Department.
8. Kyle Rector: CAREER grant, the NSF's most prestigious research award for early-career faculty in the sciences. The highly competitive awards are given to scientists who show exceptional promise for a productive and innovative academic career that integrates education and research while advancing their discipline
9. Sarah Widrow: Safer Sim Student Excellence Award
10. Sarah Widrow: WTS RI Undergraduate Scholarship
11. Jaydeep Radadiya: UMass Rising Researcher Award
12. Jaydeep Radadiya: Safer-Sim Student Excellence Award
13. Lakshmi Subramanian: University of Iowa Graduate College Post-Comprehensive Research Fellowship, Spring 2021.
14. Hanxi Tang: Iowa Center for Research by Undergraduates (ICRU) Fellowship, "Parent-Child Safety Conversations on Safety." Academic Year 2020-2021.
15. Jeehan Malik: Safer-Sim Excellence Award December 3, 2020.
16. Chao Wang: Best paper award, IISE transactions, 2020

1.3 Education and Workforce Development Accomplishments

1.3.1 Peer-reviewed journal publications w/ student authors

1. H. Nassereddine, K. R. Santiago-Chaparro, and D. A. Noyce, "Modeling VehiclePedestrian Interactions Using a Non-Probabilistic Regression Approach," Transportation Research Record, 2020.

- <https://doi.org/10.1177%2F0361198120962799>
2. Yingxue Zhang, Yanhua Li, Xun Zhou Xiangnan Kong, Jun Luo. Off-Deployment Traffic Estimation --- A Traffic Generative Adversarial Networks Approach. IEEE Transactions on Big Data
<https://doi.ieeecomputersociety.org/10.1109/TBDATA.2020.3014511>
 3. Rahman, M. H., Abdel-Aty, M. Application of Connected and Automated Vehicles in a Large-Scale Network by Considering V2V and V2I Technology' accepted at Transportation Research Record (TRR), 2020.
<https://doi.org/10.1177%2F0361198120963105>
 4. Elmquist, R. Serban, D. Negrut, "A Sensor Simulation Framework for Training and Testing Robots and Autonomous Vehicles," ASME Journal of Autonomous Vehicles, 2021. <https://doi.org/10.1115/1.4050080> .
 5. H. Choi, C. A. Crump, C. Duriez, A. Elmquist, G. D. Hager, D. Han, F. J. Hearl, J. Hodgins, A. Jain, F. A. Leve, C. Li, F. Meier, D. Negrut, L. Righetti, A. Rodriguez, J. Tan, J. Trinkle, "On the use of modeling and simulation in robotics: opportunities and challenges," Proceeding of the National Academy of Sciences, 2021
<https://doi.org/10.1073/pnas.1907856118>.
 6. Song, Y., Chitturi, M.V. and Noyce, D.A., 2021. "Automated vehicle crash sequences: Patterns and potential uses in safety testing." Accident Analysis & Prevention, 153, p.106017. <https://doi.org/10.1016/j.aap.2021.106017>
 7. Pradhan, A. K., Pai, G., Radadiya, J., Knodler Jr, M. A., Fitzpatrick, C., & Horrey, W. J. (2020). Proposed Framework for Identifying and Predicting Operator Errors When using Advanced Vehicle Technologies. *Transportation Research Record: Journal of the Transportation Research Board*. <https://doi.org/10.1177%2F0361198120938778>
 8. Jiang, Y., O'Neal, E. E., Zhou, S., Plumert, J. M., & Kearney, J. K. (2020). Crossing Roads with a Computer-generated Agent: Persistent Effects on Perception–Action Tuning. *ACM Transactions on Applied Perception (TAP)*, 18(1), 1-16.
<https://doi.org/10.1145/3431923>

1.3.2 Book chapters w/ student authors

Nothing to report

1.3.3 Conference posters and papers w/ student authors

1. Baghali, S.* and Guo, Z. (2021, Best Paper Award) Investigating the Effects of Privately Owned Electrical Vehicles on Distribution System Resilience. Presentation at the IISE Annual Conference, Online
2. Siddique, N., Afifah, F.*, Guo, Z. and Zhou, Y. (2021) Predictive Modeling for PEV Charging Behavior using Large-scale Charging Data. Presentation at the Transportation Research Board 100th Annual Meeting, Online
3. Guo, Z., Afifah, F.*, and Qi, J. (2021) A Decomposition-based Approach for Transportation and Power Systems Interdependence with Renewable Generators and Electric Vehicles. Presentation at the Transportation Research Board 100th Annual Meeting, Online.

4. Chuang, H*, Guo, Z., Aeschliman, S., Zhou, Y., Afifah, F.*, and Huang, J.(2021). Energy Impact Analyses of Electrified Ride-sourcing Services without Trip-chain Data. Presentation at the Transportation Research Board 100th Annual Meeting, Online
5. Rahman, R., Bhowmik, T., Eluru, N., and Hasan, S. (2021) Assessing the Crash Risks of Evacuation: A Matched Case-Control Approach Applied over Data Collected during Hurricane Irma, TRB Annual Meeting 2021, D.C. Washington.
6. Malik, J., Di Napoli Parr, M., Flathau, J., Tang, H., Kearney, J.K., Plumert, J.M., Rector, K.K. (in press). Determining the Effect of Smartphone Alerts and Warnings on Street-Crossing Behavior in Non-Mobility-Impaired Older and Younger Adults. ACM CHI: Conference on Human Factors in Computing Systems, 2021.
7. O’Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). How does parent gender impact the socialization of safety values in sons and daughters? Oral presentation accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
8. Parr, M., Zhou, S., O’Neal, E.E., Kearney, J.K., & Plumert, J.M. (April, 2021). How do Children Perceive and Act on Affordances When Walking vs Bicycling Across Roads? Poster accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
9. Kim, A., O’Neal, E.E., Flathau, J., Tang, H., Kearney, J.K., & Plumert, J.M. (April, 2021). A parent-based intervention program for training prospective control skills in children. Poster accepted for presentation at the 2021 biennial meeting of the Society for Research in Child Development, Virtual Conference.
10. Subramanian, L. D., O’Neal, E.E., Plumert, J. M., & Kearney, J. K. (March 19, 2021) A Study of Pedestrian Road Crossing in the Presence of eHMI using an Immersive Virtual Environment, Poster Presentation, SAFER-SIM UTC Symposium.
11. O’Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). Socialization of safety values in children: The role of parent and child gender. Oral presentation accepted for presentation at the 2021 annual meeting of the Society for Violence and Injury Research , Virtual Conference.
12. Saisubramanian, S., Roberts, S. C., Zilberstein, Z. (in press). Understanding User Attitudes Towards Negative Side Effects of AI Systems. In CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI ’21 Extended Abstracts). ACM Press.
13. J. Taves, A. Young, S. Benatti, A. Elmquist, R. Serban, A. Tasora, D. Negrut, “SynChrono: An MPI-Based, Scalable Physics-Based Simulation Framework for Autonomous Vehicles Operating in Off-Road Conditions,” International Conference for High Performance Computing, Networking, Storage, and Analysis, 2020. Poster can be found [here](#).
14. J. Taves, A. Young, S. Benatti, A. Elmquist, R. Serban, D. Negrut, “A Scalable Physics-Based Simulation Framework for Autonomous Vehicles in Chrono,” SAFER-SIM Symposium, 2021
15. J. Taves, A. Elmquist, A. Young, R. Serban and D. Negrut, “SynChrono: A Scalable, Physics-Based Simulation Platform For Testing Groups of Autonomous Vehicles

and/or Robots,” International Conference on Intelligent Robotic Systems, 2021. Paper can be found [here](#).

16. B. Claros. “Impact of Geometry and Operations on Left Turn Gap Acceptance at Signalized Intersections with Permissive Indication” Transportation Research Board Annual Meeting, 2021.
17. Didier Valdés, Benjamín Colucci, Alberto Figueroa-Medina, Yindhira Taveras, and Andrés Chamorro. Use of Driving and Virtual Reality Simulation Technologies to Visualize Transportation Safety Innovations. 100th Annual Meeting of the Transportation Research Board, Visualization Lighting Talks Lectern Session 1420, Standing Committee on Visualization in Transportation (AED-80), January 29, 2021.
18. Didier Valdés, Benjamín Colucci, Alberto Figueroa-Medina, Yindhira Taveras, María Rojas, Rocío Sotomayor-Irizarry, C. Lorena Sierra. January 2021. Safety Enhancements to Reduce Speeding in School Zones using Driving Simulation. Transportation Research Board 100th Annual Meeting. Washington, D.C..
19. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. March 2021. Study of Gap Acceptance and Walking Speeds of Pedestrians using Virtual Reality Simulation. Poster at SAFER-SIM Symposium 2021.
20. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. March 2021. Impact of Road Information Assistive Systems on Pedestrian Crossing Safety. Poster at SAFER-SIM Symposium 2021.
21. Saisubramanian, S., Roberts, S. C., Zilberstein, Z. (in press). Understanding User Attitudes Towards Negative Side Effects of AI Systems. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 Extended Abstracts)*. ACM Press.
22. Radadiya, Pai, Pradhan (2020) Are Limitations of Advanced Vehicle Technologies Described Consistently for Different Vehicle Models: An Examination for Adaptive Cruise Control, Annual Meeting of the Association for the Advancement of Automotive Medicine.
23. Ryan, A., Hennessy, E., Fitzpatrick, C., Knodler, M., and Ai, C. (2021) Driver performance at horizontal curves: A review of current simulation literature and research gaps. Poster. Safety Research Using Simulation (SAFER-SIM) Conference, 11–12 & 18–19 March, online format.

1.3.4 Paper/poster awards w/ student authors

Nothing to report

1.3.5 Graduate students working on and supported by SAFER-SIM related projects

Site	Number
University of Iowa	8
University of Wisconsin Madison	6
University of Massachusetts Amherst	13
University of Central Florida	9
University of Puerto Rico Mayaguez	5

1.3.6 Undergraduate students working on and supported by SAFER-SIM related projects

Site	Number
University of Iowa	5
University of Wisconsin Madison	3
University of Massachusetts Amherst	4
University of Central Florida	1
University of Puerto Rico Mayaguez	1

1.3.7 Student attendance and presentations at the SAFER-SIM symposium

35 students

15 student presentations

1.3.8 Transportation-related M.A. and PhD theses

Nothing to report

1.3.9 Curriculum modules developed

1. UW - The streamlined data collection procedures ideal for [this project](#) inspired a project that freshman students' part of a section of Inter ENGR 170 are working on as part of the class requirements. This project involves the design of a device to simplify data collection processes involving video.
2. UW - Simulation techniques developed for [this project](#) will be used in the Introduction to Transportation Engineering course to explain car following models.
3. UW - The new proposed class will be co-run by Negrut & Serban and draws from SAFER-SIM work from [this project](#). The name of the class is "ME468: Autonomous Vehicles and Robotics Modeling and Simulation" and will be offered in Spring 2022 to senior undergrad and MS graduate students in the College of Engineering at University of Wisconsin-Madison. Autonomous vehicles (AVs) and robotics are topics currently attracting high interest owing to their use in a broad class of applications. Testing robots and autonomous vehicles is expensive, time consuming, and at times unsafe. As such, there is a strong push in industry towards using simulation to compress the design and testing cycles for autonomous agents and accomplish these tasks at lower costs. This course will cover topics that anchor the idea of modeling and simulation of AVs and robots. The class format will be face-to-face, but the course will be open to students who are away for co-ops or internships and to online, professional development students
4. UPR - An Educational Module to Increase Engineering Students' Knowledge of Work Zone Safety in Highway Construction
An online training module about work zone safety and the design of TTC zones called WZILM was developed and administered to second-year engineering students that have not received formal road design training. WZILM included a pre-test, a mid-intervention assessment, and a post-test. WZILM was effective in increasing

awareness and knowledge among engineering students on how to correctly implement TTC plans with the goal of reducing the risk of injuries and fatalities in work zones, thus improving overall safety for drivers and workers.

5. CPH:4220:0001 Global Road Safety, Guest Lecture: Elizabeth O'Neal (February 23, 2021)
6. CS 4980:0003 Topics in Computer Science II Using Virtual Reality to Study Human Behavior
7. PSY 7150:0001 Current Topics in Psychology Using Virtual Reality to Study Human Behavior
8. Cross-listed course combining psychology and computer science/engineering students, Instructors: Jodie Plumert, Joseph Kearney (Spring semester, 2021)
9. TTE6533: Mobility in Smart Cities. Revised some class materials based on this project description

1.3.10 Student internships related to SAFER-SIM

1. Aaron Young: internship with NASA/Jet Propulsion Lab; working in the area of autonomous vehicles (rovers), Spring 2021
2. Mariam Nour: Internship with ConnectedWise. A startup company in autonomous technology

1.3.11 Presentations to student groups or classes

1. Yindhira Taveras. Use of Driving Simulators and Virtual Reality for Road Safety Research. Road Safety Conference. Vision Zero: Factors for the reduction of road accidents, March 13, 2021.
2. Part of the study was presented to the CEE450/516 Geometry Design class.
3. Presented on vehicle automation to Global Road Safety class at end of the report period, 2021.
4. Presented to a school group on vehicle kinematic safety measures in March 2021.
5. Chris Schwarz recorded a virtual career presentation that was viewed 175 times by local students
6. Chris Schwarz and Jacob Heiden Gave a virtual tour to a high school STEM class in March 2021
7. Mariam Nour: Gave tutorial on Omnet++ in TTE6533
8. Dr. Chengbo Ai has been invited to present related works to Oregon State University on 2/15/2021
9. Dr. Chengbo Ai has been invited to present related works to Shanghai University on 10/14/2020
10. Shannon Roberts and Jen McDermott were interviewed for the Youth Driven Podcast, which is a traffic safety and leadership program for Rhode Island high school students, on March 26. They discussed their work related to this study and provided tips for how to teach teens how to drive and how to interact with technology while driving.

1.3.12 # Schools visited and # students present

Nothing to report

1.3.13 # Career fairs visited and # of attendees

Nothing to report

1.3.14 Summer institutes and programs and # of students participating

Nothing to report

1.4 Technology Transfer

1.4.1 SAFER-SIM webinars

5 webinars

1.4.2 Registrations for webinars

174 registrations

1.4.3 Views of archived webinar content

241 views

1.4.4 Press releases for SAFER-SIM related research

Nothing to report

1.4.5 Media requests

Title	Publisher
1. NADS pulls in nearly \$1.5M funding to further study transition of control in automated vehicles	Iowa Technology Institute
2. National Advanced Driving Simulator awarded \$1.45 million to further research on automated vehicles	The Daily Iowan
3. Iowa City driving simulator awarded \$1.45 million to research automated vehicles	Clay & Milk
4. UI researchers using virtual reality to study ways children cross streets	The Daily Iowan

5. Iowa City bolsters bike safety with new road markings	The Daily Iowan
6. New driving behavior a concern heading into winter	CBS 2 Iowa
7. The Road to the Future Runs Through Iowa	Iowa Magazine
8. 2021 TRB Annual Meeting: Dr. Mohamed Abdel-Aty, 2020 Roy W. Crum Award recipient	TRB
9. Creating an Automated Shuttle for America's Backroads	Adapt
10. Project update: Equipment installed on new research vehicle	ADS For Rural America
11. Autonomous Lingo in the Repair Space	Adapt
12. Garrett Morris and Kyle Rector of Computer Science earn prestigious NSF CAREER awards	College of Liberal Arts and Sciences
13. Jaydeep Radadiya: UMass Amherst Rising Researcher	University of Massachusetts-Amherst
14. MIE Junior Sarah Widrow Wins Two Noteworthy Transportation Awards	University of Massachusetts-Amherst

1.4.6 Tours of facilities

1. Iowa Department of Transportation – December 9, 2020

1.4.7 Website traffic

Metric	This Period	Lifetime
Total Users	1,908	20,297
New Users	1,845	19,824
Sessions	3,253	39,366
Page Views	6,620	83,042

1.4.8 Patents filed

Nothing to report

1.4.9 DOT requests for presentations or proposals related to SAFER-SIM

UW – [This project](#) has a DOT presentation on April 27, in which we will present SAFER-SIM related work. This SAFER-SIM work complements a project that this team has with NSF/DOT. We will mention the SAFER-SIM support in this meeting and our ongoing NADS/UW-Madison project.

1.4.10 Practitioner attendance at events

41 practitioners

1.4.11 Number of improved or new simulation technologies, software, methods, or processes

1. Through this project, we developed a training program that better informs drivers of the limitations of automated vehicle technology. In comparison to no training and reading a user manual, the training system, which was delivered via PowerPoint, yielded optimal performance (i.e., drivers took back control of the vehicle quickly and efficiently).

1.5 Collaboration

1.5.1 Attendance at the SAFER-SIMposium

78 attendees

1.5.2 Interdisciplinary research projects within and across sites

1. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists (Computer Science/Psychological & Brain Sciences)
2. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians (Computer Science/Psychological & Brain Sciences)
3. Using Simulation to Study Communication between Autonomous Vehicles and Vulnerable Road Users (Computer Science/Psychological & Brain Sciences)
4. Understanding Bicyclists' Behaviors Through Learning from Big Trip Data (Business/Public Health/Urban & Regional Planning)
5. Defining Safety-Critical Scenarios for Simulation-Based Automated Vehicle Evaluation - (UW-Madison Engineering/Global Health Institute)
6. Attention and Adaption of Teen Drivers to Driving Automated Systems – (UMass College of Engineering/College of Natural Sciences)

1.5.3 Collaborative research projects across SAFER-SIM or other UTC sites

1. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians (UI/UW/UM)
2. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists (UI/UM/UCF)
3. Enhancing School Zone and School Bus Safety (UCF/UPR)
4. Evaluation of Safety Enhancements in School Zones with Familiar and Unfamiliar Drivers (UPR/UM)
5. The Impact of Driver's Mental Models of Advanced Vehicle Technologies on Safety and Performance (UI/UM)
6. Analyzing the Performance of Remote-Drivers on Transit Shuttle Short Routes (UW/UPR)
7. Interfacing Synchrono and NADS for Virtual Simulation of Conventional &

Connected and Autonomous Vehicles (UW/UI)

8. AAAFTS/SaferSim Cooperative Research Program (UI/UM/UW/UCF)

1.5.4 Collaborations with industry partners and government agencies

<i>Organization Name</i>	<i>Location</i>	<i>Contribution</i>
1. Aisin Technical Center of America	Northville, MI	Financial support
2. AAA Foundation for Traffic Safety	Washington D.C.	Financial support Collaborative research
3. InSight Learning Technologies	Pacific Palisades, CA	Personnel exchange
4. Mandli Communications Inc.	Madison, WI	In-kind support Facilities Collaborative Research
5. Continental Mapping Consultants Inc	Madison, WI	In-kind support Facilities Collaborative Research
6. Council of University Transportation Centers	Washington D.C	Financial support
7. Hyundai America Technical Center Inc.	Superior Township, MI	Financial support
8. City of Orlando	Orlando, FL	Collaborative Research
9. Recreative Association of Sport Buenaventura	Mayaguez, PR	Facilities
10. Mayaguez Bureau of Highway Patrol	Mayaguez, PR	Facilities Personnel Exchange
11. Club de Oficinistas de Mayagüez	Mayaguez, PR	Facilities
12. Puerto Rico LTAP Center, University of Puerto Rico at Mayaguez	Mayaguez, PR	Facilities
13. VHB	Washington D.C.	In-kind support
14. Lee Engineering	Phoenix, AZ	In-kind support
15. UW-Madison Global Health Institute New this period	Madison, WI	Collaborative Research

1.5.5 Collaborative peer-reviewed journal publications

Nothing to report

1.5.6 Collaborative book chapters

Nothing to report

1.5.7 Student exchanges with other SAFER-SIM sites

Nothing to report

1.5.8 Students pursuing advanced degrees at other SAFER-SIM sites

Nothing to report

1.5.9 Programs involving community colleges

Nothing to report

1.5.10 Graduates hired at other SAFER-SIM or UTC sites

Nothing to report

1.6 Diversity

1.6.1 # SAFER-SIM projects involving underrepresented/minority (U/M) students

20 projects involving 24 students

1.6.2 # U/M events attended

1. Shannon Roberts sat on a panel for students from Roosevelt University (in Chicago IL) after they viewed the documentary ‘Picture a Scientist’ on March 18. There were approximately 35 students, mostly women and many underrepresented, in attendance.

1.6.3 # U/M students at attended events

Nothing to report

1.6.4 Graduating U/M student placement

Nothing to report

1.7 Outcomes

1.7.1 Number of improved or new technologies, software, methods, or processes adopted

1. Chrono::Sensor provided for public use within Chrono:
<https://github.com/projectchrono/chrono>, directly developed under “Physics-Based Sensor Models for Virtual Simulation of Connected and Autonomous Vehicles”

2. SynChrono provided for public use within Chrono:
<https://github.com/projectchrono/chrono>, directly developed under “Physics-Based Sensor Models for Virtual Simulation of Connected and Autonomous Vehicles”

1.7.2 Stakeholders who adopt, implement or deploy SAFER-SIM research findings or technologies through policy, practice, regulation, rulemaking or legislation

1. The Chrono::Vehicle and Chrono dynamics engine have been embedded in the CARLA autonomous vehicle simulator by the CARLA team. A CARLA simulation that uses Chrono can be seen [here](#).

1.7.3 Number of projects that reach adoption, implementation or deployment

1. The Chrono::Sensor simulation infrastructure has been deployed for public use.
2. The SynChrono simulation infrastructure has been deployed for public use.

1.8 Impacts

1.8.1 Expected reductions in crashes from implemented policy, practice, regulation, rulemaking, or legislation

1. If the advanced dashboard interface from [this project](#) were implemented on a larger scale, more drivers would be aware of automated vehicle functionality and would more closely monitor the technology when it is activated. This would in turn lead to fewer instances of unexpected vehicle behavior (e.g., the vehicle doesn't stop for a pedestrian at an intersection) and fewer crashes.
2. If the training program from [this project](#) were implemented on a larger scale, more drivers would be aware of automated vehicle functionality and would more closely monitor the technology when it is activated. This would in turn lead to fewer instances of unexpected vehicle behavior (e.g., the vehicle swerves erratically near a merge) and fewer crashes.
3. The developed convoluted Gaussian process from [this project](#) can accurately predict the baseline performance of driving performance measures at various driving conditions. These predictions can save thousands level of lab simulation hours. The quantified uncertainties of the driving performance measures can also provide information for the behavior variations under different driving conditions, which reveals information for future experiment design.

1.8.2 Expected reduction in congestion and traffic conflicts from implemented policy, practice, regulation, rulemaking or legislation

Nothing to report