SAFER-SIM Accomplishments
October 1, 2020 – March 31, 2021

1. Accomplishments
1.1 Research Accomplishments

1.1.1 Peer-reviewed journal publications

Published


Accepted for publication


Submitted


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


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


Accepted/Not yet presented


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

   National Science Foundation,
   Kyle Rector (PI), University of Iowa
   Aug 2021 – Jul 2026
   $550,000
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
1.2 Leadership Development Accomplishments

1.2.1 Invited presentations


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


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 BTSCRP 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.


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)
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)
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
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
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. Benjamin Colucci: Member of the Advisory Committee of the Puerto Rico - State Transportation Innovation Council (STIC).
34. Benjamin Colucci: Member of the Advisory Committee of the US Virgin Islands - State Transportation Innovation Council (STIC).
36. Benjamin Colucci: Transportation Research Board Representative of University of Puerto Rico at Mayaguez, 1985 - Present.
40. Benjamín Colucci: Friend, TRB Standing Committee AKT30 Pavement Maintenance, 2020 - Present.
42. Benjamín Colucci: Friend, TRB Standing Committee AKT20 Pavement Preservation, 2020 - Present.
47. Benjamín Colucci: Friend, TRB Standing Committee AJE15 Workforce Development and Organizational Excellence, 2020 - Present.
51. Benjamin Colucci: Co-Chair of the Traffic Enforcement Committee, International Road Federation (IRF).
52. Benjamin Colucci: Co-Chair Vision Zero Conference in Latin America Steering Committee, International Road Federation (IRF).
53. Benjamin Colucci: Member, Transportation Forensics and Risk Management (T-FARM), Institute of Transportation Engineers (ITE), 2018 – Present.
54. Benjamin Colucci: Member, Transportation Education Council, Institute of Transportation Engineers (ITE), 2017 – Present.
55. Benjamin 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.
59. Benjamin Colucci: Safety Workgroup representing the National Local Technical Assistance
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.
65. Benjamin Colucci: Puerto Rican Academy of Engineering (APrI) Founding Member 2010 - 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.
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
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
13. Anuj K. Pradhan: Journal of Law and Mobility – Contributing Editor
17. Didier Valdés: Editorial Board Member of International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, August 2020 - Present.
Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, February 2020 - Present.
22. Benjamín Colucci: Member, TRB Committee AHB55 Work Zone Traffic Control; 2017-2020
23. Benjamín Colucci: Member Best Paper Award TRB Committee AHB55 Work Zone Traffic Control.
25. Benjamín Colucci: Member: TRB Standing Committee on Road User Measurement and Evaluation (ACH50); 2020-2022.
34. David A. Noyce: Journal of Transportation Engineering (ASCE). Associate Editor.

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
7. Eleni Christofa: TRB ACP25 Traffic Signal Systems Committee Member and Paper
Review Coordinator
10. Anuj K. Pradhan: Association for the Advancement of Automotive Medicine – Chair of Automated Vehicles Special Interest Group
13. Benjamín Colucci: Member Board of Trustees of the Society of Engineers of Puerto Rico (SIPR), Scholarship Committee 2019 - Present.
15. Benjamín Colucci: Vice-President of the International Society for Maintenance and Rehabilitation of Transport Infrastructures (ISMArT).
17. Benjamín Colucci: Director of Abertis Chair in Puerto Rico.
18. Benjamín Colucci: UPRM Program Manager of Dwight David Eisenhower Transportation Fellowship Program (DDETFP), 2010 - Present.

1.2.8 SAFER-SIM Webinars

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Date</th>
<th>Registrants</th>
<th>Archived Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Impact of Driver’s Mental Models of Advanced Vehicle Technologies on Safety and Performance</td>
<td>10/27/2020</td>
<td>30</td>
<td>54</td>
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<tr>
<td>Using Simulation to Assess Right-Hook Conflicts Between Bicycles and Cars at Protected and Unprotected Intersections</td>
<td>11/10/2020</td>
<td>43</td>
<td>72</td>
</tr>
<tr>
<td>Assessing a Two-Step Posted Speed Reduction as a Potential Countermeasure to Improve Safety in School Zones Using Driving Simulation</td>
<td>2/23/2021</td>
<td>22</td>
<td>18</td>
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</table>
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.
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".
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
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
https://doi.ieeecomputersociety.org/10.1109/TBDATA.2020.3014511

https://doi.org/10.1077%2F0361198120963105


https://doi.org/10.1073/pnas.1907856118.


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 IIESE Annual Conference, Online


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


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

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<tr>
<th>Site</th>
<th>Number</th>
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<tr>
<td>University of Iowa</td>
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<tr>
<td>University of Wisconsin Madison</td>
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<tr>
<td>University of Massachusetts Amherst</td>
<td>13</td>
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<tr>
<td>University of Central Florida</td>
<td>9</td>
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<tr>
<td>University of Puerto Rico Mayaguez</td>
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1.3.6 Undergraduate students working on and supported by SAFER-SIM related projects

<table>
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<td>University of Wisconsin Madison</td>
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<tr>
<td>University of Massachusetts Amherst</td>
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<tr>
<td>University of Central Florida</td>
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</tr>
<tr>
<td>University of Puerto Rico Mayaguez</td>
<td>1</td>
</tr>
</tbody>
</table>

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

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

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

    College of Liberal Arts and Sciences

    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

<table>
<thead>
<tr>
<th>Metric</th>
<th>This Period</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Users</td>
<td>1,908</td>
<td>20,297</td>
</tr>
<tr>
<td>New Users</td>
<td>1,845</td>
<td>19,824</td>
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<tr>
<td>Sessions</td>
<td>3,253</td>
<td>39,366</td>
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<tr>
<td>Page Views</td>
<td>6,620</td>
<td>83,042</td>
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</table>

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)
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-Driver on Transit Shuttle Short Routes (UW/UPR)
7. Interfacing Synchro and NADS for Virtual Simulation of Conventional &
1.5.4 Collaborations with industry partners and government agencies

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