SAFER-SIM Accomplishments
October 1, 2019 – March 31, 2020

1. Accomplishments
1.1 Research Accomplishments

1.1.1 Peer-reviewed journal publications

Published


Accepted for publication


Submitted


in Crash Avoidance Using Regenerative and Service Braking, Ergonomics.


1.1.2 Book chapters

1.1.3 Edited books
Nothing to report

1.1.4 Conference papers, posters, and symposia
Presented


Accepted/Not yet presented


1.1.5 Paper/poster awards
1. Mdhasibur Rahman (UCF) – won the Milton Pikarsky Memorial Award for best Master's thesis in the field of science and technology in transportation studies.
2. Rezaur Rahman (UCF) - Best MS Thesis Award in the College of Engineering and Computer Science at UCF. This award has been given among all the submissions from engineering schools at UCF.

1.1.6 External grants related to SAFER-SIM

Awarded
1. The Future of the Curb, Massachusetts Department of Transportation, $100,000, 06/01/2020-05/31/2021, Eleni Christofa co-PI with PI Eric Gonzales. The objective of this grant is to explore the demands on the curbside lane, identify future demands on the curbside lane, and identify strategies for re-purposing and managing the curbside lane. It logically builds on the current SaferSim work that is focused on understanding how future technology (driving automation systems) will impact the driving landscape. More specifically, the literature review and results from the SaferSim project will be used to inform this grant.
2. Effects of Automation on Material Handlers' Productivity and Efficiency, Toyota Material Handling North America, $150,000, 06/01/2020-05/31/2021, Shannon Roberts - The goal of this proposal is to understand how automated technologies implemented in forklifts affect the job of material handlers’. It logically builds on the current SaferSim work that is designed to investigate how driving automation technology affects driver performance.

Submitted
1. Serban submitted a proposal for a U.S. Army GVSC project, for $325,000. The focus of the proposal is on enhancements to ground vehicle simulation support in Chrono.
2. Samiul Hasan, UFC
Agency: FHWA, USDOT
Program: EAR 2020
Proposal title: RAPID-TIM: A Real-time Artificial and Predictive Intelligence
Driven Traffic Incident Management System


4. National Science Foundation Smart Connected Communities-IRG Track 1

5. A field study to examine driver use of Adaptive Cruise Control. This project involves a field study on an instrumented vehicle to examine drivers use of Adaptive Cruise control and errors committed under varying system conditions.

1.2 Leadership Development Accomplishments

1.2.1 Invited presentations

1. Radu Serban, “Vehicle Mobility with the Chrono Multiphysics Library,” October 2019, Aarhus University, Denmark

2. Dan Negrut, “Chrono: a multi-physics simulation framework for computational dynamics,” January 15, 2020, Hong Kong University of Science and Technology, China


4. Alberto M. Figueroa Medina, invitation to present the VR research study at the 1st Congress of Traumatic Brain Injury of Puerto Rico (CLT2020) during the session titled Crashes and Road Safety: Challenges and Opportunities in the Prevention of Crashes, Injuries and Interventions in Puerto Rico. The event was planned for March 19, 2020 at the Rio Piedras Campus of the University of Puerto Rico, but the event was postponed for a future date due to the COVID-19 emergency.

5. Benjamín Colucci, invitation to present road safety efforts and awareness campaigns related to the initiatives of the Decade of Action for Road Safety 2011-2020 in Puerto Rico, at the 1st Congress of Traumatic Brain Injury of Puerto Rico (CLT2020) during the session titled Crashes and Road Safety: Challenges and Opportunities in the Prevention of Crashes, Injuries and Interventions in Puerto Rico. The event was planned for March 19, 2020 at the Rio Piedras Campus of the University of Puerto Rico, but the event was postponed for a future date due to the COVID-19 emergency.


7. Benjamín Colucci, invitation to present at the 2020 Indiana Constructors, Inc. (ICI) Annual Conference in San Juan, Puerto Rico in a panel with FHWA and AGC officials with the presentation entitled Hurricane Maria and Earthquakes Experiences in Puerto Rico and its Impact to the Transportation System, February 10, 2020.


10. Alberto M. Figueroa Medina, presentation entitled New Model of Performance-Based Geometric Design of Highways, as keynote speaker in the closure session of the 1st International Congress on Highway Engineering. The congress was held at Cauca University in Popayan, Colombia. October 2, 2019.

11. Benjamín Colucci, presentation entitled Present and Future of Highway Safety, as keynote speaker in the opening session of the 1st International Congress on Highway Engineering. The congress was held at Cauca University in Popayan, Colombia. October 2, 2019.

12. Dr. Christofa participated in a panel titled: “Infrastructure Design for Bicyclists and Pedestrians” during the 2019 Road Safety and Simulation conference where she presented work related to this Protected Intersections Designs project.

13. Shannon Roberts was invited to present her work on automation, equity, and the future of work at the Future of Work Listening Session at Bose in Framingham, MA on November 13, 2019.


1.2.2 Invited papers
Nothing to report

1.2.3 Invited workshops
1. Radu Serban, Training and Tutorials on Chrono and Chrono::Vehicle, March 3-6, U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS
3. Dr. Christofa participated in a panel titled: “Infrastructure Design for Bicyclists and Pedestrians” during the 2019 Road Safety and Simulation conference where she presented work related to this project.
5. Kearney, J.K. Distributed simulation: The experimental elements. Invited presentation at the TRB Mid-year Workshop: Use of Driving Simulators to Evaluate Driver Behaviors in the Changing Transportation Landscape: Measures and Countermeasures, jointly sponsored by the Transportation Research Board and the
6. Mohamed Zaki was invited to develop and chair the session: Artificial Intelligence Tools and Algorithms for Safer Roads. at the 2020 T&DI ASCE, May 26-29th in Seattle
7. Road Safety & Simulation Conference Workshop – Automated Vehicles
8. Road Safety & Simulation Conference Workshop - Simulation Bootcamp
9. Xun Zhou gave a short presentation of spatial big data analytics in UI internal workshop on Big Data, Environmental Health, and Geospatial Science collaboration. The work in this project was used in the presentation.

1.2.4 Grant review panels
1. Shannon Roberts continues 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 provide guidance for the contractor in terms of how drivers will respond to traffic safety programs.
2. UTC National Center for Transportation Infrastructure Durability & Life-Extension (TriDurLE) Proposal ad-hoc reviewer (Knodler)

1.2.5 Advisory committees
1. Serban is member of the NATO Research Group AVT-341 on “Mobility Assessment Methods and Tools for Autonomous Military Ground Systems” and the NATO Research Group AVT-327 on “STANREC Development for the Next-Generation NATO Reference Mobility Model”
3. Scientific Review Committee for Road Safety and Simulation Conference, October 14-17, Iowa City, Iowa. (Christofa)
4. TRR Editorial Board Working Group (Christofa)
5. Yina Wu-Member, TRB Committee on Surface Transportation Weather (AH010) (2020 – ongoing)
6. TRB AHB25 Traffic Signal Systems Committee Member and Paper Review Coordinator (Christofa)
7. Member of the Phasing Subcommittee for New England Institute of Transportation Engineers (ITE) Technical Committee Project “Guidelines for Design & Implementation of Advanced Traffic Signal Functions.” (Christofa)
8. TRB AND 50, Standing Committee on Traffic Control Devices (Knodler)
11. Benjamin Colucci, Member TRB Committee AHB55 Work Zone Traffic Control.
12. Benjamin Colucci, Member Best Paper Award TRB Committee AHB55 Work Zone Traffic Control.
13. Benjamin Colucci, Member of the Advisory Committee of the Puerto Rico - State
Transportation Innovation Council (STIC).
14. Benjamin Colucci, Member of the Advisory Committee of the US Virgin Islands - State Transportation Innovation Council (STIC).
17. Benjamin Colucci, Co-Chair of the Traffic Enforcement Committee, International Road Federation (IRF).
18. Benjamin Colucci, Member, Transportation Forensics and Risk Management (T-FARM), Institute of Transportation Engineers (ITE), 2018 – Present.
19. Benjamín Colucci, Member, Transportation Education Council, Institute of Transportation Engineers (ITE), 2017 – Present.
20. Benjamin Colucci, Member, Transportation Safety Council, Institute of Transportation Engineers (ITE), 2019 – Present.
21. Benjamin Colucci, Member of the Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). January 2020 - Present.
26. Benjamin Colucci, Strategic Highway Safety Plan (SHSP) - Puerto Rico, stakeholder representing Puerto Rico LTAP - T2; Traffic Incident Management (TIM) workgroup, 2013 - Present.
28. Alberto M. Figueroa-Medina, Member, Transportation Education Council, Institute of Transportation Engineers (ITE).
29. Alberto M. Figueroa-Medina, Member, Transportation Safety Council, Institute of Transportation Engineers (ITE).
30. Alberto M. Figueroa-Medina, Member of the Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). January 2020 - Present.
31. TRB committee on vehicle automation (Schwarz)
32. SAE On Road Automated Driving Simulation Task Force (Schwarz)
33. Engineering Staff Advisory Council – Jacob Heiden
34. Engineering Staff Advisory Council – Dawn Marshall
35. TRB AHB25 Traffic Signal Systems Committee Member and Paper Review
Coordinator (Christofa)
36. TRB TADD55 Task Force on Arterials and Public Health Member (Christofa)
37. TRB AND 50, Standing Committee on Traffic Control Devices (Knodler)

1.2.6 Journal editing
1. Mathematics and Computers in Simulation (Radu Serban, associate editor)
2. ASME Journal of Computational and Nonlinear Dynamics (Radu Serban, associate editor)
3. Multibody System Dynamics (Dan Negrut, associate editor)
4. ASME Journal of Computational and Nonlinear Dynamics (Dan Negrut, guest editor)
5. Anuj K. Pradhan - Journal of Law and Mobility – Contributing Editor
6. International ACM SIGACCESS Conference on Computers and Accessibility, reviewer (Rector)
7. Spatial Cognition and Computation, editorial board (Plumert)
10. IEEE Access, reviewer (Kearney)
11. IEEE Virtual Reality Conference, reviewer (Kearney)
13. Accident Analysis and Prevention, reviewer (Kearney) Samiul Hasan, Trial Editor (Engineering), Natural Hazards Review
15. Samiul Hasan, Associate Editor, Journal of Advanced Transportation
16. Guest Editor for Transportation Research Part C: Emerging Technologies Special Issue on “Trajectory-based Modeling, Design, Operation and Assessment of Road Transportation Systems.” (Christofa)
17. Handling Editor, Transportation Research Record (Christofa)
19. Didier Valdés, Road Safety & Simulation Conference, October 2019, Iowa City, Iowa.
22. Benjamin Colucci, Editor of International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, February 2020 - Present.
24. Benjamin Colucci, 18th LACCEI International Multi-Conference for Engineering, Education, and Technology.
25. Benjamín Colucci, Road Safety & Simulation Conference, October 2019, Iowa City, Iowa.
30. Benjamin Colucci, 2019 Report Card for Puerto Rico’s Infrastructure: Roads Chapter, ASCE.
33. Alberto M. Figueroa-Medina, Reviewer for Transportation Research Record.
39. John D. Lee, Human Factors and Ergonomics in Manufacturing and Service Industries, Associate Editor
40. John D. Lee, Cognitive Engineering and Decision Making, Editorial board
41. John D. Lee, Theoretical Issues in Ergonomics Science, Editorial board
42. John D. Lee, IIE Transactions on Occupational Ergonomics Human Factors, Editorial Board
43. John D. Lee, Journal of Experimental Psychology: Applied, Principal reviewer
44. John D. Lee, Committee on Maritime Safety, Transportation Research Board
45. John D. Lee, Cognition, Technology, and Work, Editorial board member
46. John D. Lee, Human Factors, Associate editor

1.2.7 Leadership positions in professional organizations
1. Shannon Roberts serves as the Program Chair Elect for Surface Transportation Technical Group of the Human Factors and Ergonomics Society.
2. 22nd International ACM SIGACCESS Conference on Computers and Accessibility, Program Committee (Rector)
3. ACM CHI Conference on Human Factors in Computing Systems, Program Committee and Organizing Committee (Rector)
4. Xun Zhou, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (GIS) 2020, Poster Co-chair
5. Benjamin Colucci, Member, Board of Directors of the Pan-American Academy of Engineering (PAE), 2018-2020.
6. Benjamin Colucci, Member Board of Trustees of the Society of Engineers of Puerto Rico, Scholarship Committee 2019 - Present.
8. Benjamín Colucci, Vice-President of the International Society for Maintenance and Rehabilitation of Transport Infrastructures (iSMARTi).

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>2. Driver Behavior and Performance Study on In-Vehicle Display Based Speed Compliance</td>
<td>11/5/2019</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>3. Evaluation of Managed Lane Facilities in a Connected Vehicle Environment</td>
<td>11/19/2019</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>5. Assessing the Effectiveness of Connected Vehicle Technologies based on Driving Simulator Experiments</td>
<td>3/17/2020</td>
<td>42</td>
<td>18</td>
</tr>
</tbody>
</table>

179 70

1.2.9 Professional awards
1. Greek Diaspora Fellowship, Institute of International Education, funding from the Stavros Niarchos Foundation (Christofa)
2. On October 16, Shannon Roberts received the Stephanie Binder Young Professional Award from the Human Factors and Ergonomics Society – Surface Transportation Technical Group for her contribution to transportation Human Factors.
3. On January 29, Yalda Ebadi won the WTS Boston Helene M. Overly Memorial/Ann Hershfang Memorial Scholarship to help her pursue a career path in transportation.
4. Francis Tainter (UM) received the CUTC Student of the Year award from our
5. Award winner: UCF SST team
   Prince Michael International Road Safety Awards, Dec 2019
6. Benjamin Colucci, American Society of Civil Engineers (ASCE) Fellow Member, January 2020
7. Jinghui Yuan – University of Central Florida, Graduate SAFER-SIM Excellence Award
8. Morgan Parr – University of Iowa, Graduate SAFER-SIM Excellence Award
9. Francis Tainter – University of Massachusetts, Graduate SAFER-SIM Excellence Award
10. Maria Xelena Rojas Ibarra – University of Puerto Rico-Mayaguez, Graduate SAFER-SIM Excellence Award
11. Jorge Ugan – University of Central Florida, Undergraduate SAFER-SIM Excellence Award
12. Hanxi Tang – University of Iowa, Undergraduate SAFER-SIM Excellence Award
13. Jaydeep Radadiya – University of Massachusetts-Amherst, Undergraduate SAFER-SIM Excellence Award

1.3 Education and Workforce Development Accomplishments

1.3.1 Peer-reviewed journal publications w/ student authors

1.3.2 Book chapters w/ student authors
Nothing to report
1.3.3 Conference posters and papers w/ student authors


1.3.4 Paper/poster awards w/ student authors

1. Mdhasibur Rahman (UCF) – won the Milton Pikarsky Memorial Award for best Master's thesis in the field of science and technology in transportation studies.
1.3.5 Graduate students working on and supported by SAFER-SIM related projects

<table>
<thead>
<tr>
<th>Site</th>
<th>Number</th>
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<tbody>
<tr>
<td>University of Iowa</td>
<td>8</td>
</tr>
<tr>
<td>University of Wisconsin Madison</td>
<td>3</td>
</tr>
<tr>
<td>University of Massachusetts Amherst</td>
<td>13</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td>9</td>
</tr>
<tr>
<td>University of Puerto Rico Mayaguez</td>
<td>6</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site</th>
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</thead>
<tbody>
<tr>
<td>University of Iowa</td>
<td>10</td>
</tr>
<tr>
<td>University of Wisconsin Madison</td>
<td>0</td>
</tr>
<tr>
<td>University of Massachusetts Amherst</td>
<td>11</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td>0</td>
</tr>
<tr>
<td>University of Puerto Rico Mayaguez</td>
<td>2</td>
</tr>
</tbody>
</table>

1.3.7 Student attendance and presentations at the SAFER-SIM symposium

19 students attended

1.3.8 Transportation-related M.A. and PhD theses

1. Aikaterini Deliali’s dissertation chapter. Title of the dissertation: “Modelling the Interactions Between Cyclists and Motorists Under the Presence of Bicycle-Specific Infrastructure Treatments.”

2. Yalda Ebadi successfully defended her PhD proposal on November 7. This SaferSim project is the focus of her PhD dissertation.

1.3.9 Curriculum modules developed

1. Developed and Taught in Fall 2019 the graduate course at UCF: TTE5531: Active mobility and Technologies: Synergy and Challenges

2. Developed a module related to multi-stage learning and control based on micro-simulation for civil engineering graduate course CGN 5617, Infrastructure Systems Optimization and Identification.

3. Use the Iowa motor vehicle crash data analysis as course projects in MSCI:4220 Advanced Database Management and Big Data, and MSCI:6610 Big Data Management and Analytics.

1.3.10 Student internships related to SAFER-SIM

1. Kabir Khurana, an undergraduate researcher on this project, plans to take an internship in WSP in 2020 because of his experience in this SAFER-SIM project working on the CVAT software for video segmentation algorithm training.

2. Logan Bruck internship at University of Iowa
3. Omkar Yadav internship at the University of Iowa

### 1.3.11 Presentations to student groups or classes
1. 10/11/2019 Maria Rojas, Alcibiades Bustillo, Cindy Sierra, and Natacha Cardona, presentation entitled Innovation in Traffic Safety Using Driving Simulation, offered at the Open House event held at the University of Puerto Rico at Mayaguez. 30 people present.
2. 11/6/2019 Shannon Roberts discussed her research and Industrial Engineering coursework to 20 Industrial Engineering undergraduate students from IISE—Institute of Industrial and Systems Engineers
4. 10/30/2019 Traffic Safety Merit Badge 15
5. 11/5/2019 Project Lead the Way Tours 49
6. 11/11/2019 Kirkwood Academy Tour 10
7. 2/1/2020 Explore Engineering @ Iowa 50
8. 3/2/2020 FTC Competition Outreach 170
9. 3/7/2020 APO Merit Badge University 2
10. 3/7/2020 Explore Engineering @ Iowa 40
11. 3/8/2020 Traffic Safety Merit Badge 31

### 1.3.12 # Schools visited and # students present
1. Aarhus University (October, 2019): 30 students present (invited lecture)
2. Hong Kong University of Science and Technology: 20 students present (invited lecture)
3. University of Washington, Seattle: 5 students present
4. 11/14/2019 Bettendorf Classroom Visit 148
5. 11/22/2019 Oelwein Classroom Visit 222

### 1.3.13 # Career fairs visited and # of attendees
1. 11/26/2019 STEAM Institute 168
2. 2/18/2020 Linn County STEM Festival 320
3. 2/22/2020 Southeast Iowa STEM Festival 155
4. 2/23/2020 Career Caravan 50

### 1.3.14 Summer institutes and programs and # of students participating
1. UCF, Hasan – we organized a Data Science Competition which could be considered as similar to curriculum development. This is the closest area where I thought we can describe this activity. Under this activity, we organized a Data Science Challenge among the engineering students participating in the ASCE Southeast Regional Conference. In this competition, students were given a dataset of infrastructure disruption collected from a social media platform with a task was to label the type and extent of disruption. 12 teams registered for the competition.
Unfortunately, due to COVID-19 UCF had to cancel the event.
Details about the competition:
https://studentconferences.asce.org/southeast/competitions/big-data-challenge/

1.4 Technology Transfer
1.4.1 SAFER-SIM webinars
6 webinars

1.4.2 Registrations for webinars
179 registrations

1.4.3 Views of archived webinar content
70 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. <a href="#">There's an $80 million driving simulator in Iowa, and we tried it out</a></td>
<td>Ars Technica</td>
</tr>
<tr>
<td>2. Automated Vehicle Technology with Dr. Dan McGehee</td>
<td>Insight on Business</td>
</tr>
<tr>
<td>3. <a href="#">Bicycle safety tips to keep you cruising through the winter months</a></td>
<td>KWWL</td>
</tr>
<tr>
<td>4. <a href="#">Experts stress winter driving safety following recent snowfall</a></td>
<td>KCRG</td>
</tr>
<tr>
<td>5. <a href="#">Experts seeing more phone-related injuries</a></td>
<td>KCRG</td>
</tr>
<tr>
<td>6. <a href="#">Iowa researchers prepare rural roads for the future</a></td>
<td>University of Iowa</td>
</tr>
<tr>
<td>7. <a href="#">President Harreld: As the semester ramps up, remember the importance of undergraduate research</a></td>
<td>Iowa Now</td>
</tr>
</tbody>
</table>

1.4.6 Tours of facilities
1. 10/3/19 State Farm tour NADS
2. 10/14/19 Road Safety & Simulation Conference Hank Lab open house
3. 10/14/19 Road Safety & Simulation Conference - National Advanced Driving Simulator open house
4. 10/23/19 Daily Iowan tour of Hank Lab
5. 11/18/19 FHWA tour of NADS
6. 12/17/19 Hyundai Motors
7. 11/6/19 Haylie Miller, UNT Health Sciences, DeLTA Center speaker
8. 11/6/19 Aisin Technical Center of America
9. 1/31/20 University of Nebraska, Faculty in Theatre and Journalism
10. 2/12/20 Toyota Media Event at NADS
11. 3/4/20 Colorado DOT
12. 3/12/20 Iowa DOT

[Note: Text in square brackets indicates links that are not visible in the image.]
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>4011</td>
<td>9641</td>
</tr>
<tr>
<td>New Users</td>
<td>3938</td>
<td>9641</td>
</tr>
<tr>
<td>Sessions</td>
<td>6992</td>
<td>16,392</td>
</tr>
<tr>
<td>Page Views</td>
<td>11,515</td>
<td>39,219</td>
</tr>
</tbody>
</table>

1.4.8 **Patents filed**

Nothing to report

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

1. Effectiveness of Bicycle Boxes in Massachusetts, Massachusetts Department of Transportation

1.4.10 **Practitioner attendance at events**

35 industry members registered for webinars

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

1. The VR simulation code was made in four levels: (i) Set up the VR environment to reflect an urban city context with commercial and residential buildings (ii) Include a pedestrian pathing system to add pedestrian avatars along sidewalks in the scenario (iii) Modify traffic flow patterns with different vehicle speeds and vehicle gaps between subject runs (modification to the original code supplied by Dr. Kearney from University of Iowa), and (iv) Incorporate a counter of subject runs and a counter of vehicle-pedestrian collisions and is shown on a display board for the subject to be aware of the number of runs and crashes in the experiment.

2. This project established a new capability in our lab to run “wizard of Oz” experiments where a participant drives our full simulator and the experimenter can control a second virtual vehicle in the same world.

3. Data reduction protocols for eye data and driving measures.

4. The research team is currently finalizing a software package for eye-tracking video analysis, object identification, and integration with eye-tracking trace.

5. We are developing a new agent-based simulation framework based on Repast Simphony to better capture the dynamic decision making of vehicles and V2I.

6. Ongoing work (1) new Chrono::Sensor module and (2) sensor models for producing realistic data for testing autonomous vehicle control algorithms. For Chrono::Sensor, the focus is creating a framework for users to test, with software-in-the-loop, various safety critical scenarios involving automated vehicles. For (2), the focus is exploration, development, and implementation of sensor models that seek to produce synthetic data with appropriate noise, distortion, and degradation.
1.5 Collaboration

1.5.1 Attendance at the SAFER-SIMposium
35 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)

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 Synchro 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

<table>
<thead>
<tr>
<th>Organization Name</th>
<th>Location</th>
<th>Contribution</th>
</tr>
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<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, Collaborative research</td>
</tr>
<tr>
<td>3. InSight Learning Technologies</td>
<td>Pacific Palisades, CA</td>
<td>Personnel exchange</td>
</tr>
<tr>
<td>4. Mandli Communications Inc.</td>
<td>Madison, WI</td>
<td>In-kind support, Facilities</td>
</tr>
<tr>
<td>5. Continental Mapping Consultants</td>
<td>Madison, WI</td>
<td>In-kind support, Collaborative Research</td>
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<tr>
<td></td>
<td>Inc</td>
<td>Facilities</td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>7.</td>
<td>Hyundai America Technical Center Inc.</td>
<td>Superior Township, MI, Financial support</td>
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<td></td>
<td>Previously not reported</td>
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<tr>
<td>8.</td>
<td>City of Orlando</td>
<td>Orlando, FL, Collaborative Research</td>
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<tr>
<td></td>
<td>New this period</td>
<td></td>
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<tr>
<td>9.</td>
<td>Recreative Association of Sport Buenaventura</td>
<td>Mayaguez, PR, Facilities</td>
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<td>New this period</td>
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<td>10.</td>
<td>Mayaguez Bureau of Highway Patrol</td>
<td>Mayaguez, PR, Facilities</td>
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<td>11.</td>
<td>Club de Oficinistas de Mayagüez</td>
<td>Mayaguez, PR, Facilities</td>
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<td>New this period</td>
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<td>12.</td>
<td>Puerto Rico LTAP Center, University of Puerto Rico at Mayaguez</td>
<td>Mayaguez, PR, Facilities</td>
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<td>New this period</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**
1. Dawn Marshall is a member of the Workplace Learning Connection’s Johnson County Team through Kirkwood Community College. The purpose of this team is to provide support, access and advice, connecting the Workplace Learning Connection staff to local business professionals for the purpose of Job Shadows, Internships, Speakers, Events, Tours, etc.
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

1. Safely and Effectively Communicating Non-Connected Vehicle Information to Connected Vehicles through Field- and Driving Simulator-Based Research – UW
2. Augmented Reality for Safer Pedestrian-Vehicle Interactions – UW
3. Detailed Analysis of Roadway Users Interactions at Intersections with Flashing Yellow Arrows - UW
4. V2I Infrastructure Placement and Safety Implications of CAVs in an Interconnected Network - UCF
5. Assessing the Effectiveness of Connected Vehicle Technologies based on Driving Simulator Experiments - UCF
6. Enhancing School Zone and School Bus Safety - UPR
7. Assessing the Impact of Smartphone Usage While Driving in Work Zones - UPR
8. Evaluation of Safety Enhancements in School Zones with Familiar and Unfamiliar Drivers – UPR
10. DRIVER’ SAFETY ASSESSMENT IN TWO-LANE RURAL ROADS WORK ZONES - UPR
11. ASSESSING A TWO-STEP POSTED SPEED REDUCTION AS A POTENTIAL COUNTERMEASURE TO IMPROVE SAFETY IN SCHOOL ZONES USING DRIVING SIMULATION - UPR
12. Drivers’ Performance and Brain Workload Activities after Alcohol Consumption using Driving Simulation – UPR
13. The Impact of Driver’s Mental Models of Advanced Vehicle Technologies on Safety and Performance – UM
14. Training to Improve Situational Awareness Regarding Operational Design Domain in Driving Automation Systems – UM
15. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians – UM
17. Protected Intersection Design for Safer Cycling – UM
19. Integrating Traffic Control Devices via Augmented Reality – UM
20. To Trust or Not to Trust? A Simulation-based Experimental Paradigm – UM
21. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists – UM
22. The Influence of Unmanned Aerial Systems on Driving Performance – UM
23. Using Simulation to Study Communication between Autonomous Vehicles and Vulnerable Road Users – UI
24. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians - UI
25. Understanding Bicyclists’ Behaviors Through Learning from Big Trip Data – UI
26. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists – UI
27. Extended Evaluation of Training Programs to Accelerate Hazard Anticipation Skills in Novice Teen Drivers – UI
28. Mobile Applications to Help Older Adults Make Safe Street-Crossing Decisions – UI

1.6.2 # U/M events attended
   1. Tech Chicks Career Day – 28 students

1.6.3 # U/M students at attended events
28 female students

1.6.4 Graduating U/M student placement
Nothing to report