

Daniel Carruth, Ph.D.

Center for Advanced Vehicular Systems
Mississippi State University
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Education

Ph.D., Cognitive Science.

Mississippi State University, August 2008.

Dissertation: Assessing Impact of Instruction Treatments on Positive Test Selection in Hypothesis Testing.

Advisor: Gary L. Bradshaw.

B.S., Computer Science

Mississippi State University, December 2001.

Professional Positions

Associate Research Professor. July 2020 – Present.

Center for Advanced Vehicular Systems

Mississippi State University, Mississippi State, MS

Associate Director, Advanced Vehicle Systems. July 2017 – Present.

Center for Advanced Vehicular Systems

Mississippi State University, Mississippi State, MS

Associate Director, Human Factors. July 2011 – 2019.

Center for Advanced Vehicular Systems

Mississippi State University, Mississippi State, MS

Assistant Research Professor. July 2009 – June 2020.

Center for Advanced Vehicular Systems

Mississippi State University, Mississippi State, MS

Research Associate I. April 2006 – July 2009.

Center for Advanced Vehicular Systems

Mississippi State University, Mississippi State, MS

Research/Teaching Assistant. August 2002 – December 2005.

Department of Psychology

Mississippi State University, Mississippi State, MS

Classes: Cognitive Science, Abnormal Psychology, General Psychology, Cognitive Skills Models.

Research Funding

External Research Funding - \$25,668,473

Development of Prototype Digital Twin Immersive Environments. (2024-2026). US Army Engineer Research and Development Center, PI: C. Walden, CoPI: **D Carruth**, S Fuller, J Parker. Amount: \$1,391,727.

NASA STTR: Quantification of Trust in a Crew Health Integrated Medical Response Agent (CHIMERA). (2024-2025). NASA / Nahlia (Prime), PI: **D. Carruth**. Amount: \$45,668.

A Shared Meta-Model Framework to Enable Multi-Directional Reliance for Effective Collaborative Human-Autonomy Teaming. (2024). University of Michigan Automotive Research Center, PI: **D Carruth**, CoPI: C. Bethel. Amount: \$123,061.

Assess Public Space Safety and Protect Soft Targets Against Intentional Attacks: Modeling and Behavior Analysis. (2024). US Department of Homeland Security / Northeastern University (Prime), PI: M. Maruffuzaman, CoPI: **D Carruth**, L Cagle. Amount: \$118,404.

North Mississippi Regional Law Enforcement Technology Project. (2022-2025). US Department of Justice Bureau of Justice Assistance, PI: C Bethel. Amount: \$600,000.

Recognizing and Reconstructing Distorted and Obscured Perceptual Sensor Data Resulting from Soiling of the Sensor. (2022-2024). University of Michigan Automotive Research Center, PI: **D Carruth**. Amount: \$336,135.

Enhancing Modeling and Simulation of Autonomous Ground Vehicle Systems. (2022-2024). US Army Engineer Research and Development Center, PI: D Carruth, CoPI: C Goodin, A Card, and B Jelinek. Amount: \$3,602,255.

Multi-modal Threat Detection (M2TD) System. (2021-2023). US Air Force Civil Engineering Command, Torch Technologies (Prime), PI: R Mosher, CoPI: **D Carruth**, A Card, C Park, and D Wallace. Amount: \$450,000.

Systems Engineering Topic 4 – Maintenance Related AR Visualization. (2021-2023). Department of Defense. PI: E Swan, CoPI: **D Carruth**, C Bethel. Amount: \$382,456.

Military Engineering Program - Autonomous Vehicle Simulation in Cold Region Environments. (2021-2023). US Army Engineer Research and Development Center, PI: **D Carruth**, CoPI: C Goodin. Amount: \$500,403.

Dynamic Task Allocation and Understanding of Situation Awareness Under Different Levels of Autonomy in Closed-Hatch Military Vehicles. (2020-2022). University of Michigan Automotive Research Center, PI: C Bethel, CoPI: **D Carruth**. Amount: \$303,230.

Ground Vehicle Mobility Research. (2019-2021). US Army Engineer Research and Development Center (W912HZ-19-C0036). PI: Walden, C. Amount: \$3,080,000.

Future Grower Technologies: Developing Virtual Reality Support Tools for Controlled Environment Agriculture Systems. (2019-2024). USDA National Institute of Food and Agriculture, PI: A. Fox, CoPI: **D Carruth**, S Deb. Amount: \$495,314.

Hierarchical Assessment of Autonomous Navigation Algorithms. (2019-2022). University of Michigan Automotive Research Center, PI: **D Carruth**, CoPI: C Goodin, L Dabiru. Amount: \$416,593.

High-Quality Simulation for Maintenance Transit Operator Training. (2018). Mississippi Department of Transportation (MDOT), PI: **D Carruth**, J McGinley. Amount: \$74,534.

Intelligent Mobility – Experimental Testing at Various Autonomy Levels. (2018). US Army TARDEC, PI: Jones, R, CoPI: **D Carruth**, G Mason, C Hudson. Amount: \$365,188.

Virtual Learning Lab: Risk Assessment Training Module. (2017). Toyota Motor Manufacturing Mississippi, PI: **D Carruth**, Key Personnel: S Deb, M Hamilton. Amount: \$100,318.

Proving Ground and Dismounted Troops Topic Area 4: Computational Prototyping and Proving Ground Environment: Task 1 Human Interactions for the Computational Proving Ground. (2017-2020). US Army ERDC, PI: **D Carruth**, CoPI: L Strawderman, J Usher, D May, C Bethel. Amount: \$1,326,688.

Proving Ground and Dismounted Troops Topic Area 4: Computational Prototyping and Proving Ground Environment: Task 2 HPC-based Vision Systems for the Computational Proving Ground. (2017-2020). US Army ERDC, PI: **D Carruth**, CoPI: L Strawderman. Amount: \$683,245.

Analytics and Data Sciences Topic Area 2: Big Data Analytics Task 4: Web-based User Interfaces for Specification of Simulation Data and Parameters. (2017-2020). US Army ERDC, PI: **D Carruth**. Amount: \$364,212.

Big Data Visualization Topic Area 2: Big Data Analytics Task 1: Augmented and Virtual Reality Methods for Visualizing ERS Tradespace Data. (2017-2020). US Army ERDC, PI: E Swan, CoPI: **D Carruth**. Amount: \$1,506,896.

Human Factors and Ergonomics Occupant-Centric Design Framework for CRES-GV Ground Vehicle Design Concept Analysis Tools. (2013-2018). US Army ERDC, PI: **D Carruth**, CoPI: L Strawderman, T Garrison. Amount: \$785,542.

Virtual Testbed Environments for CRES-GV Ground Vehicle Design Concept Analysis Tools. (2013-2018). US Army ERDC, PI: **D Carruth**, CoPI: C Bethel, T Garrison. Amount: \$1,619,885.

Interactive and Collaborative Workspaces for Exploration of Ground Vehicle Design Concepts. (2013-2018). US Army ERDC, PI: C Bethel, CoPI: **D Carruth**. Amount: \$1,259,098.

FedEx Project ISE-02. (2017). FedEx Express, PI: L Strawderman, CoPI: C Bethel, **D Carruth**, J Mohammadi-Aragh. Amount: \$169,334.

SimBRS WD59: Big Data Analytics for ERS Tradespace. (2016). US Army TACOM, PI: R King, CoPI: L Wang, L Bian, H Medal, JR Burt, M Rais-Rohani. Responsible portion: \$122,646.

SimBRS WD62: HPC-based Sensor Analytics. (2016). US Army TACOM, PI: R King, D Anderson, E Swan, J Ball, H Medal, **D Carruth**. Amount: \$1,199,995. Responsible Portion: \$158,832.

SimBRS WD64: Virtual Prototyping of Vehicle Systems. (2016). US Army TACOM, PI: R King, CoPI: D Marcum, N Shamsaei, F Vahedifard, S Thompson, K Walters, **D Carruth**. Amount: \$2,799,990. Responsible Portion: \$372,000.

Framework for Autonomous Vehicle Navigation. (2015). FedEx Express, PI: **D Carruth**, CoPI: L Strawderman, Amount: \$81,591.

Transportation Safety. (2015). FedEx Express, PI: L Strawderman, CoPI: T Garrison, K Babski-Reeves, **D Carruth**. Amount: \$144,201.

Providing Dynamic Environments for Integrated Virtual Prototyping. (2015). US Army ERDC, PI: **D Carruth**, CoPI: L Strawderman, J Usher, D May, C Bethel. Amount: \$329,712.

Evaluation of Human-Product Interfaces: Models of Sensing. (2015). US Army ERDC, PI: **D Carruth**, CoPI: L Strawderman. Amount: \$159,964.

Integrating Dynamic Environments for Unmanned Ground Vehicle Simulation. (2014). Consortium for Energy, Environment, & Demilitarization (CEED), PI: **D Carruth**, CoPI: L Strawderman, J Usher, D May, C Bethel. Amount: \$326,839.

Occupant Centric Framework: Effective Field of View. (2014). Consortium for Energy, Environment, & Demilitarization (CEED), PI: **D Carruth**, CoPI: L Strawderman. Amount: \$162,499.

TARDEC High Performance Computing Operations Improvement. (2013). US Army TARDEC, PI: R King. Key Personnel: **D Carruth**. Amount: \$119,997.

Improving Safety of Vulnerable Road Users: Effectiveness of Environment and In-Vehicle Warning Systems at Intermodal Interchanges. (2012). National Center for Intermodal

Transportation and Economic Competitiveness, PI: **D Carruth**, CoPI: L Strawderman.
Amount: \$140,556 (\$70,278 internal cost-share)

Assessing Human Capability as a Constraint in Energy Management System Design. (2011).
Navy ESRDC, PI: **D Carruth**. Amount: \$142,959

Investigation of Law Enforcement Officer Driving Behavior and Performance in an
Advanced Driving Simulator. (2010). National Institute of Justice, PI: C. Williams, CoPI:
D Carruth. Amount: \$190,331

Improving Behavior and Visualization of Entities in Battle Scenario Simulation for
TARDEC Ground Vehicle Simulation Lab (GVSL) - Extension. (2010). TARDEC/Army,
PI: G McFadyen, CoPIs: **D Carruth**, J McGinley, Z Rowland. Amount: \$360,061

Improving Behavior and Visualization of Entities in Battle Scenario Simulation for
TARDEC Ground Vehicle Simulation Lab (GVSL). (2009). TARDEC/Army, PI: G
McFadyen, CoPIs: K Babski-Reeves, **D Carruth**, J McGinley, Z Rowland. Amount:
\$359,998

Using Virtual Soldier Research (VSR) to Determine the Work Required to Integrate
Cognitive Architecture/Modeling into the TARDEC Ground Vehicle Simulation Lab
(GVSL). (2008). TARDEC/Army, PI: G McFadyen, CoPIs: K Babski-Reeves, **D
Carruth**, J McGinley, Z Rowland. Amount: \$84,933

Virtual Soldier Research; Human Factors Development and Evaluation. (2007).
TARDEC/Army, PI: Z Rowland, CoPIs: K Babski-Reeves, **D Carruth**, G McFayden, J
McGinley. Amount: \$750,000

Investigation of the Effects of Increased Coverage Area for Soft Body Armor. (2007-2012).
National Institute of Justice (NIJ), PI: K Babski-Reeves, CoPIs: **D Carruth**, J McGinley.
Amount: \$310,662

Mississippi Active Shooter Training Evaluation. (2007). Bureau of Justice Assistance (BJA),
PI: Lt. K Rogers, CoPI: **D Carruth**. Amount: \$87,074

Validation of Optimization-Based Formulations and Performance of Dynamic Human
Models: A Comparison of Real and Simulated Design Assessments. (2006).
TARDEC/Army, PI: Z Rowland, CoPIs: K Babski-Reeves, **D Carruth**, G McFayden, J
McGinley. Amount: \$1,162,820

Internal Research Funding

Mississippi State University Mitchell Memorial Library CAVS Mixed Reality Lab (2017).
Center for Advanced Vehicular Systems Internal Funding, PI: **D Carruth**, CoPI: S
Cunetto, Amount: \$40,000.

Human Performance Lab Virtual Reality Enhancements (2015). Center for Advanced Vehicular Systems Internal Funding, PI: **D Carruth**, Co-PI: H Chander, A Knight, Amount: \$100,000.

Human Factors Issues in UAV Operations: An Evaluation of Transfer of Controls between Operators (2013). Raspet Flight Laboratory Internal Funding, PI: **D Carruth**, Co-PI: L Strawderman, Amount: \$10,000.

Driver Behavior and Performance Working Group (2012). ORED Interdisciplinary Cross-College Research Internal Funding, PI: **D Carruth**, Amount: \$2,000

Micro-Air Vehicle Emergency Responder-Investigator Collaboration: Human Factors and Robotics Research Initiative (2011). Bagley College of Engineering Internal Funding, PI: **D Carruth**, Amount: \$3,795

Human Factors Working Group Support (2011). Bagley College of Engineering Internal Funding, PI: **D Carruth**, Amount: \$1,500

Sports Performance Program Extension. (2011). CAVS Internal Funding, PI: **D Carruth**, Amount: \$23,000

Down Syndrome Working Group (2010). ORED Interdisciplinary Cross-College Research Internal Funding, PI: S Agiovlaitis, Co-PIs: B Hale, A Knight, **D Carruth**, Amount: \$2,000

Driver Behavior and Performance Working Group (2010). ORED Interdisciplinary Cross-College Research Internal Funding, PI: **D Carruth**, Amount: \$2,000

Human Factors Issues in UAV Operations: an Initial Review of Interface Usability (2010). Raspet Flight Laboratory Internal Funding, PI: L Strawderman, Co-PIs: K Babski-Reeves, **D Carruth**, Amount: \$24,832

Human Factors Working Group Support (2010). Bagley College of Engineering Internal Funding, PI: **D Carruth**, Amount: \$2,000

Sports Performance Program Proposal. (2010). CAVS Internal Funding, PI: **D Carruth**, Co-PI: G McFadyen, Amount: \$31,438

Fidelity of Human Performance in Simulated Tasks Using Accelerometer-Based Game Controllers. (2008). CAVS Internal Funding, PI: **D Carruth**, Amount: \$10,000

Law Enforcement Research Initiative. (2006). CAVS Internal Funding, PI: **D Carruth**, Co-PI: Mark Thomas, Amount: \$37,338

Publications

Refereed Journal Publications

1. Rader, N.E., Heath, C., May, D.C., Gaddy, C., Hudson, C., & **Carruth, D.** (2024). A Qualitative Examination of Precautionary Measures in a Virtual Reality Fear Environment. *American Journal of Criminal Justice*. <https://doi.org/10.1007/s12103-024-09770-y>
2. Goodin, C., Moore, M.N., **Carruth, D.W.**, Aspin, Z., & Kaniarz, J. (2024). Geometric Fidelity Requirements for Meshes in Automotive Lidar Simulation. *Virtual Worlds*, 3(3), 270-282. <https://doi.org/10.3390/virtualworlds3030014>
3. **Carruth, D.W.**, Goodin, C., Dabbiru, L., Scherrer, N., Moore, M.N., Hudson, C.H., Cagle, L.D., & Jayakumar, P. (2024). Comparing Real and Simulated Performance for an Off-Road Autonomous Ground Vehicle in Obstacle Avoidance. *Journal of Field Robotics*, 41(3), 798-810. <https://doi.org/10.1002/rob.22289>
4. Goodin, C., Moore, M.N., Carruth, D.W., Hudson, C.R., Cagle, L.D., & Jayakumar, P. (2024). An empirical vehicle speed model for tuning throttle controller parameters. *International Journal of Vehicle Performance*, 10(2), 196-214. <https://doi.org/10.1504/IJVP.2024.137690>
5. Lei, T., Luo, C., Yang, S.X., **Carruth, D.W.**, & Bi, Z. (2023). Bio-Inspired Intelligence-Based Multiagent Navigation with Safety-Aware Considerations. *IEEE Transactions on Artificial Intelligence*, 5(6), 2946-2961. <https://doi.org/10.1109/TAI.2023.3334227>
6. Lei, T., Sellers, T., Luo, C., **Carruth, D.W.**, & Bi, Z. (2023). Graph-based robot optimal path planning with bio-inspired algorithms. *Biomimetic Intelligence and Robotics*, 3(3), 100119. <https://doi.org/10.1016/j.birob.2023.100119>
7. Short, D., Lei, T., Luo, C., **Carruth, D.W.**, & Bi, Z. (2023). A bio-inspired algorithm in image-based path planning and localization using visual features and maps. *Intelligence & Robotics*, 3(2), 222-241. <http://dx.doi.org/10.20517/ir.2023.14>
8. Conner, N.O., Freeman, H.R., Jones, J.A., Luczak, T., **Carruth, D.W.**, Knight, A.C., and Chander, H. (2022). Simulator Sickness in Virtual Reality: Concerns, Causes, Assessment & Mitigation. *Virtual Worlds*, 1, 130-146. DOI: 10.3390/virtualworlds102008
9. Boone, J., Goodin, C., Dabbiru, L., Hudson, C., Cagle, L., & **Carruth, D.** (2022). Training Artificial Intelligence Algorithms with Automatically Labelled UAV Data from Physics-Based Simulation Software. *Applied Sciences*, 13(1), 131. MDPI AG. Retrieved from DOI: 10.3390/app13010131
10. Sharma, S., Dabbiru, L. K., Hannis, T., Mason, G., **Carruth, D.W.**, Doude, M., Goodin, C., Hudson, C., Ozier, S. & Ball, J.E. (2022). CaT: CAVS Traversability Dataset for Off-Road Autonomous Driving. *IEEE Access*, vol. 10, pp. 24759-24768, 2022, DOI: 10.1109/ACCESS.2022.3154419.

11. Aghalari, A., Morshedlou, N., Marufuzzaman, M. & **Carruth, D.** (2021) Inverse reinforcement learning to assess safety of a workplace under an active shooter incident, *IISE Transactions*, 53:12, 1337-1350, DOI: 10.1080/24725854.2021.1922785
12. Goodin, C., Carrillo, J. T., Monroe, J. G., **Carruth, D. W.**, & Hudson, C. R. (2021). An Analytic Model for Negative Obstacle Detection with Lidar and Numerical Validation Using Physics-Based Simulation. *Sensors*. 21(9), 3211. DOI:10.3390/s21093211.
13. Luczak, T., Burch V, R. F., Smith, B. K., Lamberth, J., **Carruth, D. W.**, Crane, C., Hoppa, M., & Burgos, B. (2020). Perception of Comfort, Fit, and Jumping Performance of Elite NCAA Division 1 Student-athletes: The Effect of Basketball Shoe Design - Part II. *International Journal of Kinesiology & Sports Science*. 8(3), 45-57. DOI:10.7575/aiac.ijkss.v.8n.3p.45.
14. Kodithuwakku Arachchige, S., Chander, H., Knight, A., Burch, R., & **Carruth, D.** (2020). Occupational Falls: Interventions for Fall Detection, Prevention, and Safety Promotion. *Theoretical Issues in Ergonomics Science*. <https://doi.org/10.1080/1463922X.2020.1836528>
15. Luczak, A., Burch, R., Smith, B., Chander, H., **Carruth, D.**, Lamberth, J., Collin, C., Bollwinkel, D., & Burgos, B. (2020). Using Human Factors Engineering and Garvin's Product Quality to Develop a Basketball Shoe Taxonomy. *Part P: Journal of Sports Engineering and Technology*. <https://doi.org/10.1177/1754337120965421>
16. Cole, M., Lucas, C., Kulkarni, K., **Carruth, D.**, Hudson, C., Jayakumar, P., & Gorsich, D. (2020). Quantitative assessment of modelling and simulation tools for autonomous navigation of military vehicles over off-road terrains. *International Journal of Vehicle Performance*, 6 (3), 327-355.
17. Chander, H., Kodithuwakku Arachchige, S.N.K., Wilson, S.J., Knight, A.C., Burch, R.F.V., **Carruth, D.W.**, Wade, C. & Garner, J.C. (2020). Impact of Military Footwear Type and Load Carriage on Slip Initiation Biomechanics. *International Journal of Human Factors and Ergonomics*, 7(2), 125-142. <https://doi.org/10.1504/IJHFE.2020.10031690>
18. Chander, H., Shojaei, A., Deb, S., Kodithuwakku Arachchige, S. N. K., Hudson, C., Knight, A. C., & **Carruth, D. W.** (2020). Impact of Virtual Reality–Generated Construction Environments at Different Heights on Postural Stability and Fall Risk. *Workplace Health & Safety*. <https://doi.org/10.1177/2165079920934000>
19. Luczak, A., Burch, R.F.V., Smith, B., Lamberth, J., & **Carruth, D.** (2020). Jumping Performance of Elite NCAA Division 1 Student-athletes: The Effect of Basketball Shoe Design – Part 1. *International Journal of Kinesiology & Sports Science*, 8(2), 17-25. <https://dx.doi.org/10.7575//aiac.ijkss.v.8n.2p.17>
20. Kodithuwakki Arachchige, S.N.K., Chander, H., Turner, A.J., Wilson, S.J., Simpson, J.D., Knight, A.C., Burch V, R.F., Wade, C., Garner, J.C., & **Carruth, D.W.** (2020).

Muscle Activity during Postural Stability Tasks: Role of Military Footwear and Load Carriage. *Safety*, 6(3), 35. <https://doi.org/10.3390/safety6030035>

21. Luczak, T., Burch V, R.F., Smith, B.K., **Carruth, D.W.**, Lamberth, J., Chander, H., Knight, A., Ball, J.E., & Prabhu, R. (2020). Closing the Wearable Gap – Part V: Development of a Pressure-Sensitive Sock Utilizing Soft Sensors. *Sensors*, 20(1), 208. <http://doi.org/10.3390/s20010208>
22. Deb, S., **Carruth, D.W.**, & Hudson, C.R. (2020). How communicating features can help pedestrian safety in the presence of self-driving vehicles: Virtual reality experiment. *IEEE Transactions on Human-Machine Systems*, 1-11. <https://doi.org/10/1109/THMS.2019.2960517>
23. Z. Shelly, Stewart, E., Fonville, T., Burch V, R.F., Chander, H., Strawderman, L., May, D., Smith, J., **Carruth, D.W.**, & Bichey, C. (2019). Helmet Prototype Response Time Assessment using NCAA Division 1 Collegiate Football Athletes. *International Journal of Kinesiology and Sports Science*, 7(4), 53-65. <http://dx.doi.org/10.7575/aiac.ijkss.v.7n.4p.53>
24. Chander, H., Kodithuwakku Arachchige, S.N.K., Hill, C.M., Turner, A.J., Deb, S., Shojaei, A., Hudson, C., Knight, A.C., & **Carruth, D.W.** (2019). Virtual-Reality-Induced visual perturbations impact postural control system behavior. *Behavioral Sciences*, 9(11), 113. <https://doi.org/10.3390/bs9110113>
25. Li, X., Tang, B., Ball, J.E., Doude, M., & **Carruth, D.W.** (2019). Rollover-Free path planning for off-road autonomous driving. *Electronics*, (8)6, 614. <https://doi.org/10.3390/electronics8060614>
26. Sharma, S., Ball, J.E., Tang, B., **Carruth, D.W.**, Doude, M., & Islam, M.A. (2019). Semantic segmentation with transfer learning for off-road autonomous driving. *Sensors*, 19(11), 2577. <https://doi.org/10.3390/s19112577>
27. Goodin, C., **Carruth, D.W.**, Doude, M., & Hudson, C.R. (2019). Predicting the influence of rain on LIDAR in ADAS. *Electronics*, 8(1), 89. <https://doi.org/10.3390/electronics8010089>
28. Chander, H., Knight, A.C., & **Carruth, D.W.** (2019). Does minimalist footwear design aid in postural stability and fall prevention in ergonomics? *Ergonomics in Design*, 27(4), 22-25. <https://doi.org/10.1177/1064804619843384>
29. Chander, H., Knight, A. C., Garner, J. C., Wade, C., **Carruth, D. W.**, Wilson, S. J., Gdovin, J. R., Williams, C. C. (2019). Impact of military type footwear and load carrying workload on postural stability. *Ergonomics*, 62(1), 103-114. <https://doi.org/10.1080/00140139.2018.1521528>

30. Goodin, C., Doude, M., Hudson, C.R., & **Carruth, D.W.** (2018). Enabling Off-Road Autonomous Navigation - Simulation of LIDAR in Dense Vegetation. *Electronics*, 7(9), 154. <https://doi.org/10.3390/electronics7090154>
31. Deb, S., Strawderman, L. J., **Carruth, D. W.** (2018). Investigating pedestrian suggestions for external features on fully autonomous vehicles: A virtual reality experiment. *Transportation Research Part F: Traffic Psychology and Behaviour*, 59 (Part A), 135-149. <https://doi.org/10.1016/j.trf.2018.08.016>
32. Durst, P.J., Goodin, C.T., Bethel, C.L., Anderson, D.T., **Carruth, D.W.**, & Lim, H. (2018). A Perception-Based Fuzzy Route Planning Algorithm for Autonomous Unmanned Ground Vehicles. *Unmanned Systems*, 6(4), 251-266. <https://doi.org/10.1142/S2301385018500073>
33. Louine, J. L., May, D., **Carruth, D. W.**, Bethel, C. L., Strawderman, L., & Usher, J. (2018). Are Black Robots Like Black People? Examining How Negative Stigmas about Race Are Applied to Robots. *Sociological Inquiry* Wiley Online Publishers. <https://onlinelibrary.wiley.com/doi/abs/10.1111/soin.12230>
34. Strawderman, L., **Carruth, D.W.**, Sherman-Morris, K., Menard, P., Warkentin, M., & McNeal, K. (2018). Individual transportation decisions under conditions of risk and uncertainty. *Natural Hazards*, 92(2), 927-942. <https://doi.org/10.1007/s11069-018-3232-0>
35. Chander, H., Knight, A.C., Garner, J.C., Wade, C., **Carruth, D.W.**, DeBusk, H. & Hill, C.M. (2018). Impact of military type footwear and workload on heel contact dynamics during slip events. *International Journal of Industrial Ergonomics*, 66, 18-25. <https://doi.org/10.1016/j.ergon.2018.02.008>
36. Turner, A.J., Swain, J.C., McWhirter, K.L., Knight, A.C., **Carruth, D.W.**, & Chander, H. (2018). Impact of occupational footwear and workload on lower extremity muscular exertion. *International Journal of Exercise Science*, 11(1), 331-341. <https://digitalcommons.wku.edu/ijes/vol11/iss1/4>
37. Strawderman, L., Campbell, S., May, D., Bethel, C. L., Usher, J., & **Carruth, D. W.** (2018). Understanding Human Response to the Presence and Actions of Unmanned Ground Vehicle Systems in Field Environments. *IEEE Transactions on Human-Machine Systems*, 48(4), 325-336. <https://doi.org/10.1109/THMS.2017.2717905>
38. Strawderman, L., King, K., & **Carruth, D.** (2018). Improving Safety of Vulnerable Road Users: Effectiveness of Environment and In-Vehicle Warning Systems at Intermodal Exchanges. *Journal of Transportation Safety & Security*, 10(3), 177-192. <http://dx.doi.org/10.1080/19439962.2016.1237598>.
39. Deb, S., Strawderman, L., **Carruth, D. W.**, DuBien, J., Smith, B. K., & Garrison, T. M. (2017). Development and Validation of a Questionnaire to Assess Pedestrian Receptivity

toward Fully Autonomous Vehicles. *Transportation Research Part C: Emerging Technologies*, 84, 178-195. <http://dx.doi.org/10.1016/j.trc.2017.08.029>

40. Deb, S., Strawderman, L., DuBien, J., **Carruth, D.W.**, Smith, B., & Garrison, T. (2017). Evaluating pedestrian behavior at crosswalks: Validation of a pedestrian behavior questionnaire for the U.S. population. *Accident Analysis and Prevention*, 106, 191-201. <http://dx.doi.org/10.1016/j.aap.2017.05.020>.
41. Usher, J., McCool, R., Strawderman, L., **Carruth, D.W.**, Bethel, C.L., & May, D. (2017). Simulation modeling of pedestrian behavior in the presence of unmanned mobile robots. *Simulation Modelling Practice and Theory*, 75, 96-112. <https://doi.org/10.1016/j.simpat.2017.03.012>
42. Deb, S., **Carruth, D.W.**, Sween, R., Strawderman, L., & Garrison, T. (2017). Efficacy of virtual reality in pedestrian safety research. *Applied Ergonomics*, 65, 449-460. <http://dx.doi.org/10.1016/j.apergo.2017.03.007>.
43. May, D. C., Holler, K. J., Bethel, C.L., Strawderman, L., **Carruth, D.W.**, & Usher, J. (2017). Survey of Factors for the Prediction of Human Comfort with a Non-anthropomorphic Robot in Public Spaces. *International Journal of Social Robotics*, 9(2), 165-180. <http://dx.doi.org/10.1007/s12369-016-0390-7>.
44. Burch, R. F., Strawderman, L., & **Carruth, D.** (2016). Ruggedized Handheld Device Input Effectiveness by Generation: A Time and Error Study. *International Journal of Industrial Ergonomics*, 54, 146-153. <http://dx.doi.org/10.1016/j.ergon.2016.06.001>.
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12. King, K., **Carruth, D.**, Strawderman, L., Garrison, T. M., & Campbell, S. (2014). Improving Safety of Vulnerable Road Users. *2014 Industrial and Systems Engineering Research Conference*. Montreal, Canada.
13. **Carruth, D.W.**, Strawderman, L., & Garrison, T. (2013). Improving safety of vulnerable road users: Effectiveness of environment and in-vehicle warning systems at a bus terminal. *Proceedings of the 1st National Center for Intermodal Transportation for Economic Competitiveness Annual Conference*, Starkville, MS.
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19. **Carruth, D.**, McGinley, J., Mikulski, C., & Shvartsman, A. (2010). Advancing the Behavior Modeling and Visualization of Entities in the Ground Vehicle Simulation

Laboratory. Proceedings of *2010 NDIA Ground Vehicle Systems Engineering and Technology Symposium*, Dearborn, MI.

20. Garrison, T., Thomas, M.D., & **Carruth, D.** (Aug 2009). Understanding soldier tasks for effective simulation. In *Proceedings of the First Annual Ground Vehicle Systems Engineering and Technology Symposium (GVSETS)*, Troy, MI.
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24. Thomas, M., McGinley, J., **Carruth, D.W.**, & Blackledge, C. (Jun 2007). Cross-Validation of an Infrared Motion Capture System and an Electromechanical Motion Capture Device. *Proceedings of the Society of Automotive Engineers Digital 2007 Human Modeling Conference*, Seattle, WA.
25. **Carruth, D.W.**, & Littell, N. (May 2007). Leveraging CATIA V5 and Virtools for Environment Simulation . *COE 2007 Annual PLM Conference & TechniFair*, Las Vegas, NV.
26. **Carruth, D. W.**, Robbins, B., Thomas, M.D., Morais, A., Letherwood, M., & Nebel, K. (2006). Symbolic Model of Perception in Dynamic 3D Environments. In *Proceedings of the 25th Army Science Conference*, Orlando, FL. (poster)
27. Thomas, M.D., **Carruth, D. W.**, McGinley, J., Follett, F. (2006). Task Irrelevant Scene Perception and Memory During Human Bipedal Navigation in a Genuine Environment. In *Proceedings of the 25th Army Science Conference*, Orlando, FL. (poster)
28. Brou, R.J., **Carruth, D.W.**, Doane, S.M., Vickery, R., & Moorhead, R. J., II. (Sep 2002). Effects of Disorientation on Human Spatial Cognition: Object Localization in Virtual Environments. *46th Annual Meeting of the Human Factors Society*, Baltimore, MD, 2184-2188. (poster)

Invited Conference Paper

1. **Carruth, D.W.** (August 2018). Simulation for training and testing intelligent systems. *Proceedings of the World Symposium on Digital Intelligence for Systems and Machines (DISA 2018)*, pp. 101-106. Kosice, Slovakia. <https://doi.org/10.1109/DISA.2018.8490615>

Abstracts

1. Bethel, C. L., & **Carruth, D. W.** (Mar 2017). Privacy Expectations and Concerns Related to the Use of Robots in Law Enforcement. *Privacy-Sensitive Robotics Workshop at the 12th ACM/IEEE International Conference on Human-Robot Interaction*, Vienna, Austria.
2. Patnaik, S., Babski-Reeves, K., Ahmed, S., Littlejohn, R., & **Carruth, D.** (May 2009). Comparison of Postural Analysis Techniques: Application of Ergonomic Tools with a Law Enforcement Perspective. *Proceedings of the Annual Institute of Industrial Engineering Research Conference*, Miami, Florida.

Book Chapter

1. **Carruth, D. W.**, & Duffy, V. G. (2008). Integrating Cognitive and Digital Human Models for Virtual Product Design. In Chebykin, Bedny, and Karwowski (Eds.), *Ergonomics and Psychology: Developments in Theory and Practice* Taylor and Francis, 29-40.

Professional Presentations

1. Rader, N. E. (Author & Presenter), May, D. C., Hudson, C., **Carruth, D. W.**, Gaddy, C. (Author), Windhorn, C. (Author), (November 17, 2022). Using virtual environments to better measure fear of crime. *2021 Annual Meeting of the American Society of Criminology*, Chicago, IL.
2. Chander H, Kodithuwakku SNK, Turner A, Deb S, Shojaei A, Hudson C, Knight A & **Carruth D.** Impact of Virtual Reality Generated Construction Environments at Different Heights on Postural Stability. *South East American College of Sports Medicine Annual Meeting*, Jacksonville, FL, February 13th-15th, 2020.
3. **Carruth, D. W.**, Deb, S. (July 25, 2019). Pedestrian Receptivity and Their Interaction with Autonomous Vehicles. *Applied Human Factors and Ergonomics Conference 2019*.
4. **Carruth, D.W.** (December 15, 2018). NATO Autonomy Exploratory Team Meeting: Benchmarks and Testing. *NATO 43rd Applied Vehicle Technology Panel Business Meeting*, Athens, Greece.
5. Doude, M., **Carruth, D.W.**, & Goodin, C. (October 24, 2018). Where the Road Ends: AI-Based Autonomous Mobility in Unstructured Environments. *NVIDIA GPU Technology Conference*, Washington, DC.
6. Mason, G. L., **Carruth, D.W.**, Hudson, C.R., Jayakumar, P., Cole, M.P., & Smith, W. (June 18, 2018). Test Operation Procedures for Autonomous MRZR. *Military Operations Research Symposium*, Naval Postgraduate School, Monterey, CA.

7. **Carruth, D.W.** (December 15, 2018). NATO Autonomy Exploratory Team Meeting: Benchmarks and Testing. *NATO 43rd Applied Vehicle Technology Panel Business Meeting*, Athens, Greece.
8. **Carruth, D.W.** (2018). Moderator for Panel Discussion on the Purpose of Autonomous Driving. *3rd Roundtable on the Purpose of Autonomous Driving (ROAD 2018)*, Starkville, MS.
9. **Carruth, D.W.** (2017). Applications of computational simulation for analysis of autonomous systems. *2nd International Symposium on Advanced Vehicle Technology (ISAVT 2017)*, Starkville, MS.
10. **Carruth, D.W.** (2016). Extending Analysis of Field of View: Can the Operator See Critical Visual Information? *RAMSIS Update Conference 2016*, Troy, MI.
11. Garrison, T., Williams, C., **Carruth, D.W.**, Brown, K. (2012). Impact of Dispatch Communication and Display Characteristics on Law Enforcement Patrol Situation Awareness. *Officer Safety and Wellness Meeting*, Washington, DC: Office of Justice Programs: Bureau of Justice Assistance and Community Oriented Policing Services.
12. **Carruth, D.W.**, & Babski-Reeves, K. (2011). Law Enforcement Officer Body Armor Research Program: Assessing Impact of Current and Next Generation Armor Designs on Law Enforcement Officers. *NIJ Conference 2011*, Arlington, VA.
13. **Carruth, D.W.** (2011). Law Enforcement Body Armor Ergonomics. *NIJ/NIST Body Armor Technical Working Group*, Baltimore, MD.
14. **Carruth, D.W.** (2010). Law Enforcement Human Factors: Ergonomics, Simulation and Training. *Mississippi Higher Education Leadership Preparedness Conference*, Itta Bena, MS.
15. Lofton, J., Tuggle, T., Hamell, S., Loftin, C., & **Carruth, D.W.** (Mar 2009). Mississippi Active Shooter Training Program. *Southern States Homeland Security Conference*, Biloxi, MS.
16. **Carruth, D.W.** (Jun 2007). Law Enforcement Research Initiative. *Mississippi Association of Chiefs of Police Summer Conference*, Biloxi, MS.

Other Publications

1. NATO. NATO Standard AMSP-06: Guidance for Standards Applicable to the Development of Next Generation NATO Reference Mobility Models (NG-NRMM), Edition A, Version 1, April 2021.
2. NATO. Mobility Assessment Methods and Tools for Autonomous Military Ground Systems. NATO STO Technical Memorandum (TM-AVT-ET-194). April 2021.

Service and Committees

- Founder and Chair of the Summit on Advancing Modeling and Simulation for Autonomous Ground Vehicles (SAMS AGV) – 2023, 2024
- Technical Team Member and Co-Chair – NATO Applied Vehicle Technology Panel Team (AVT-408)
- Technical Team Member – NATO Applied Vehicle Technology Panel Team (AVT-341) on “Mobility Assessment Methods and Tools for Autonomous Military Ground Systems”
- Technical Team Member – NATO Applied Vehicle Technology Panel Exploratory Team (AVT-ET-194) on “Mobility Assessment Methods and Tools for Autonomous Military Ground Systems”
- Technical Team Member – NATO Applied Vehicle Technology Panel Team (AVT-327) on “Standardization Recommendation (STANREC) Development for Next-Generation NATO Reference Mobility Model (NRMM)”
- Guest – NATO Applied Vehicle Technology Panel
- Organizing Committee – Roundtable on the Purpose of Autonomous Driving 2018, Starkville, MS
- Member – Virtual Reality/Augmented Reality Association (VRARA), Training Committee, Criminal Justice Committee (2018-2019)
- Member – Society of Automotive Engineers (SAE)
- Member – Scientific Advisory and Program Board for 4th International Conference on Digital Human Modeling (July 2013)
- General Committee Member - Society of Automotive Engineers 2007 Digital Human Modeling for Design and Engineering Conference and Expo

- Reviewer – International Journal of Human Factors Modeling and Simulation (IJHFMS), Applied Ergonomics, Sensors, Electronics, Safety, Journal of Autonomous Vehicles and Systems
- Reviewer – DISA 2018

- Reviewer – National Research Council of Canada, 2020
- Reviewer – VEGA Commission for The Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic (MESRaSSR) and of the Slovak Academy of Sciences (SAS), 2020
- Reviewer - NIOSH Study Section –October 2017, June 2017, February 2019, October 2020, February 2022, October 2022

- Committee Member - ISE MS Thesis (David Close, 2010)
- Committee Member - ISE MS Thesis (Chris Blackledge, 2011)
- Committee Member – ISE MS Thesis (Katherine King, 2014)
- Committee Member – ISE MS Thesis (Angela Brooke Cannon, 2014)
- Advisor – ISE MS Thesis (Leif Jensen, 2015)
- Committee Member – ISE MS Thesis (YuWei Sun, 2016)
- Committee Member – ISE PhD Dissertation (Steve McElhaney, 2013)
- Committee Member – ISE PhD Dissertation (Reuben Burch, 2014)

Committee Member – ISE PhD Dissertation (Mahmud Rahman, 2016)
Committee Member – ISE PhD Dissertation (Shuchisnigda Deb, 2017)
Committee Member – ISE PhD Dissertation (Tony Luczak, 2019)
Committee Member – ISE PhD Dissertation (Emily Wall, 2020)
Committee Member – ISE PhD Dissertation (Justin Cardisco, 2022)
Co-Advisor – CSE PhD Dissertation (Christopher Hudson, 2022)
Committee Member – CSE PhD Dissertation (Phillip J. Durst, 2019)
Committee Member – CSE PhD Dissertation (Viswadeep Lebakula, 2021)
Committee Member – CSE PhD Dissertation (Jessie Cossitt, 2022)
Committee Member – CSE MS Project (Lucas Kramer, 2018)
Committee Member – CSE MS Project (Daniel Waddell, 2018)
Committee Member – CSE MS Project (Eli Davis, 2019)
Committee Member – CSE MS Thesis (Karl Smink, 2019)
Committee Member – ISE PhD Dissertation (Christina Rinaudo)
Committee Member – ISE PhD Dissertation (Eric Kolstad)
Committee Member – ISE PhD Dissertation (Jamison Hicks)
Committee Member – CSE MS Thesis (Nick Scherer)
Advisor – ISE MS Thesis (Riku Kikuta, 2023)
Advisor – CME PhD Thesis (Riku Kikuta)
Committee Member – PhD, Andrinandrasana David Rasamoelina, Technical University
of Kosice
External examiner for PhD defense of Amelie Grenier, Cranfield University