Exponent®
Engineering & Scientific Consulting

Jake Valente, Ph.D.

Senior Associate | Vehicle Engineering
Philadelphia
+1-215-594-8803 | jvalente@exponent.com

Professional Profile

Dr. Valente's expertise centers around transportation safety, leveraging his educational background, which includes engineering mechanics, biomedical engineering, and human factors engineering. Dr. Valente is experienced in the area of emergency response and operations, including, but not limited to motor vehicle crashes. At Exponent, Dr. Valente works on projects involving motor vehicle crashes and accident reconstruction. He is well experienced in human subject research and experimental design, having conducted multiple research projects to better understand driver behavior. His experience also includes the use and manipulation of large-scale datasets to address transportation safety concerns, design of human-machine interfaces for various autonomous vehicle applications, and analysis of naturalistic driving data.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, Virginia Polytechnic Institute and State Univ, 2023

B.S., Engineering Science and Mechanics, Virginia Polytechnic Institute and State Univ, 2019

Prior Experience

Graduate Research Assistant, Virginia Tech Transportation Institute, 2019-2023

Professional Affiliations

2019-2024, Member of the Association for the Advancement of Automotive Medicine

Publications

Valente, J. T., Jain, S., Amin, A., & Perez, M. A. (2023). Evaluation of the effectiveness of non-contact respiration rate detection for post-crash care application. Accident Analysis & Prevention, 193, 107302. doi:https://doi.org/10.1016/j.aap.2023.107302

Perez, M. A., Sudweeks, J. D., Sears, E., Valente, J., & Guo, F. (2023). Differences in frequency of occurrence, event characteristics, and pre-impact vehicle kinematics between crashes, near-crashes, and single vehicle conflicts in a large-scale naturalistic driving study. Traffic injury prevention, 24(1), 32-37.

Perez, M. A., Sears, E., Valente, J. T., Huang, W., & Sudweeks, J. (2021). Factors modifying the likelihood of speeding behaviors based on naturalistic driving data. Accident Analysis & Prevention, 159, 106267.

Valente, J. T., & Perez, M. A. (2020). Emergency Response to Vehicle Collisions: Feedback from

Emergency Medical Service Providers. Safety, 6(4), 48. MDPI AG.

Presentations

Valente, J. T. & Perez, M. A. (2023, Jan. 8-12). National Emergency Medical Services Information System (NEMSIS) Delay Analysis. Presented at the Dwight David Eisenhower Transportation Fellowship Poster Session within the Scientific Conference for the Transportation research Board, Washington, D.C.

Valente, J. T., & Perez, M. A. (2022, October). National Emergency Medical Services Information System (NEMSIS) Delay Analysis. Presented at the Association for the Advancement of Automotive Medicine 66th Annual Scientific Conference, Portland, Oregon.

Valente, J. T. & Perez, M. A. (2022, May 3-5). Investigation into the NEMSIS Database and Emergency Response Event Delays. Presented at the 2022 Virginia Highway Safety Summit, Alexandria, VA.

Valente, J. T., Gizaw, M., Kawka, K., & Perez, M. A. (2022, Mar. 20-23). Analysis of Emergency Vehicle Traffic Interactions Captured Through Naturalistic Driving Data: Implications for Emergency Medical Transportation. Presented at the 2022 HFES International Health Care Symposium, New Orleans, LA.

Valente, J. T. & Perez, M. A. (2022, Jan. 9-13). Improving Emergency Response to Motor Vehicle Collision. Presented at the Dwight David Eisenhower Transportation Fellowship Poster Session within the Scientific Conference for the Transportation research Board, Washington, D.C.

Perez, M.A., Valente, J.T., & Sudweeks, J.M. (2020, November). Determining characteristics of speeding behavior using naturalistic driving data. Presented at Safer Roads 2020 International Conference, Richmond, VA.

Valente, J. T., & Perez, M. A. (2020, October). Emergency Response to Vehicle Collisions: Feedback from Emergency Medical Service Providers. Presented at the Association for the Advancement of Automotive Medicine 64th Annual Scientific Conference, Virtual Live

Project Experience

Prior to joining Exponent, Dr. Valente worked as a graduate research assistant at the Virginia Tech Transportation Institute (VTTI). In this role he conducted and supported various research projects aimed to improve transportation safety. These research projects covered topics including driver behavior captured from naturalistic driving, occupant monitoring, and the development of guidelines for autonomous vehicle operations - specifically for interactions with public safety vehicles and personnel. Dr. Valente's doctoral work focused on improving emergency response to motor vehicle crashes by approaching the topic from both the perspective of first responders and crash occupants. This work was the first of its kind in capturing point-of-view driving data from ambulances that was used to assess how emergency vehicles are operated and how other road users interact with them in complex and dynamic roadway scenarios. His work also included the development of a proof-of-concept system to passively monitor and assess occupant vitals following a detected crash. This work was defended and published under the title "From Crash to Care: A Road Towards Improved Safety and Efficiency of Emergency Medical Response" in January 2024. Additionally, for two years Dr. Valente practiced as an emergency medical technician (EMT) in the state of Virginia where he captured firsthand experiences working with motor vehicle crashes, crash occupants, and physicians, which contributes to his expertise in the related field. Dr. Valente is trained in the most recent version of the Abbreviated Injury Scale (AIS15).

Peer Reviews

Transportation Research Record

Traffic Injury Prevention

Journal of Safety Research

Injury Prevention