

Exponent®
Engineering & Scientific Consulting

Sleiman Safaoui, Ph.D., CFEI

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Professional Profile

Dr. Sleiman Safaoui's expertise is in electrical and computer systems, including robotics, autonomy, advanced driver assistance systems (ADAS), automotive and consumer electronics, electric vehicles (EVs), and other battery-powered devices. His work focuses on safety evaluations, failure analysis, design reviews, testing, and analysis.

Dr. Safaoui works on automotive projects involving electrical and electronic systems, including infotainment, communication, ADAS technologies, airbag and occupant protection systems, and vehicle charging systems. His experience includes EV charging systems, charging accessories, on-board chargers, DC/DC converters, battery charging circuits, and related charging protocols and infrastructure. He reviews design documents, inspects field failures, and performs targeted testing and analysis.

Dr. Safaoui also performs analysis and testing of battery systems, consumer electronics, and commercial robotic systems. He conducts failure analyses and fire investigations involving automotive systems and consumer devices and supports intellectual property infringement litigation.

Dr. Safaoui's research background focuses on aerial and ground robotic system design and control through complex and intelligent algorithms. His work spans the design and assembly of battery-powered robotic platforms with various sensing modalities, including cameras and LiDAR, as well as the deployment of autonomy stacks using novel risk-based planning and decision-making algorithms based on control theory, statistics, optimization, and machine learning.

Prior to joining Exponent, Dr. Safaoui worked in the Controls, Optimization, and Networks Lab at The University of Texas at Dallas, where he developed motion planning algorithms and managed the lab's single- and multi-agent robotic platforms. Dr. Safaoui also worked at Mitsubishi Electric Research Laboratories, where he developed and implemented solutions for autonomous vehicle decision-making and multi-agent motion planning.

Academic Credentials & Professional Honors

Ph.D., Electrical Engineering, University of Texas, Dallas, 2023

M.S., Electrical Engineering, University of Texas, Dallas, 2023

B.S., Electrical Engineering, University of Texas, Dallas, 2019

Excellence in Education Doctoral Fellowship, University of Texas as Dallas, 2020-2023.

Best Paper Award, Joint Workshop on CPS and IoT Security and Privacy (CPSIoTSec), in conjunction with the ACM Conference on Computer and Communications Security, 2021, Seoul, South Korea.

Licenses and Certifications

Certified Fire and Explosion Investigator (CFEI)

Prior Experience

Research Associate, The University of Texas at Dallas, Mar 2024-May 2024

Research Assistant, The University of Texas at Dallas, 2019-2023

Research Intern, Mitsubishi Electric Research Laboratories (MERL), Aug 2021-Mar 2022

Research Experience for Undergraduates, The University of Texas at Dallas, 2017-2019

Professional Affiliations

Institute of Electrical and Electronics Engineers (IEEE)

Society of Automotive Engineers (SAE)

National Association of Fire Investigators (NAFI)

Patents

U.S. Patent 12,572,154: System and method for controlling motion of one or more devices. Vinod AP, Safaoui S, Chakrabarty A, Quirynen R, Yoshikawa N, and Di Cairano S.

U.S. Patent 12,515,652: System and method for vehicle decision making and motion planning using real-time mixed-integer programming. Quirynen R, Safaoui S, Di Cairano S.

Publications

Safaoui S, Koszegi G, Kuykendal M. "Safety Risks for EV DC Fast Charging Adapters." In 2025 IEEE International Symposium on Product Compliance Engineering (ISPCE), San Francisco, CA, USA, 2025, pp. 1-6, doi: 10.1109/ISPCE64260.2025.11044893.

Safaoui S, Vinod AP, Chakrabarty A, Quirynen R, Yoshikawa N, Di Cairano S. “Safe multi-agent motion planning under uncertainty for drones using filtered reinforcement learning.” IEEE Transactions on Robotics. 2024 Apr 10.

Renganathan V, Safaoui S, Kothari A, Gravell B, Shames I, Summers T. “Risk bounded nonlinear robot motion planning with integrated perception & control. Artificial Intelligence.” 2023 Jan 1;314:103812.

Safaoui S, Lindemann L, Shames I, Summers TH. “Risk-Bounded Temporal Logic Control of Continuous-Time Stochastic Systems.” In 2022 American Control Conference (ACC) 2022 Jun 8 (pp. 1555-1562). IEEE.

Vinod AP, Safaoui S, Chakrabarty A, Quirynen R, Yoshikawa N, Di Cairano S. “Safe multi-agent motion planning via filtered reinforcement learning.” In 2022 International Conference on Robotics and Automation (ICRA) 2022 May 23 (pp. 7270-7276). IEEE.

Quinonez R, Safaoui S, Summers T, Thuraisingham B, Cardenas AA. “Shared reality: detecting stealthy attacks against autonomous vehicles.” In Proceedings of the 2th Workshop on CPS&IoT Security and Privacy 2021 Nov 15 (pp. 15-26).

Safaoui S, Gravell BJ, Renganathan V, Summers TH. “Risk-averse RRT* planning with nonlinear steering and tracking controllers for nonlinear robotic systems under uncertainty.” In 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2021 Sep 27 (pp. 3681-3688). IEEE

Renganathan V, Fathian K, Safaoui S, Summers T. “Spoof resilient coordination in distributed and robust robotic networks.” IEEE Transactions on Control Systems Technology. 2021 Mar 29;30(2):803-10.

Fathian K, Safaoui S, Summers TH, Gans NR. “Robust distributed planar formation control for higher order holonomic and nonholonomic agents.” IEEE Transactions on Robotics. 2020 Aug 24;37(1):185-205

Safaoui S, Lindemann L, Dimarogonas DV, Shames I, Summers TH. “Control design for risk-based signal temporal logic specifications.” IEEE Control Systems Letters. 2020 May 29;4(4):1000-5.

Fathian K, Safaoui S, Summers TH, Gans NR. “Robust 3D distributed formation control with collision avoidance and application to multirotor aerial vehicles.” In 2019 International Conference on Robotics and Automation (ICRA) 2019 May 20 (pp. 9209-9215). IEEE.

Presentations

Safaoui S, Koszegi G, Kuykendal M. "Safety Risks for EV DC Fast Charging Adapters." Oral presentation, 2025 IEEE International Symposium on Product Compliance Engineering (ISPCE), 2025.

Safaoui S, Summers TH. “Distributionally Robust CVaR-Based Safety Filtering for Motion Planning in Uncertain Environments.” Oral and Poster presentation, IEEE International Conference on Robotics and Automation (ICRA), 2024.

Safaoui S, Lindemann L, Shames I, Summers TH. “Risk-Bounded Temporal Logic Control of Continuous-Time Stochastic Systems.” Oral presentation, American Control Conference (ACC), 2022

Safaoui S, Gravell BJ, Renganathan V, Summers TH. “Risk-averse RRT* planning with nonlinear steering and tracking controllers for nonlinear robotic systems under uncertainty.” Oral presentation, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.

Safaoui S, Lindemann L, Dimarogonas DV, Shames I, Summers TH. “Control design for risk-based signal temporal logic specifications.” Oral presentation, IEEE Conference on Decision and Control (CDC), 2020.

Fathian K, Safaoui S, Summers TH, Gans NR. “Robust 3D distributed formation control with collision avoidance and application to multirotor aerial vehicles.” Poster presentation, IEEE International Conference on Robotics and Automation (ICRA), 2019.