

Abdulaziz Shamsah

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 Abdulaziz Shamsah

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Education

- 2019 – 2024 • **Ph.D., Georgia Institute of Technology** in Mechanical Engineering.
Thesis title: *Safe Bipedal Locomotion and Navigation in Uncertain Environments*.
- 2016 – 2018 • **M.S.E., University of Pennsylvania** in Mechanical Engineering.
Thesis title: *Analytically-Guided Design of a Tailed Bipedal Hopping Robot*.
- 2013 – 2015 • **B.S., Rensselaer Polytechnic Institute** in Mechanical Engineering.

Professional Experience

- 2025 – Present • **Assistant Professor.** Kuwait University.
- 2020 – 2024 • **Graduate Research Assistant.** Laboratory for Intelligent Decision and Autonomous Robots, Georgia Institute of Technology, Atlanta, GA., USA
- 2019 – 2019 • **Research Associate** Kuwait Institute for Scientific Research.
- 2016 – 2018 • **Graduate Research Assistant** GRASP Lab, University of Pennsylvania, Philadelphia, PA., USA
- 2017 – 2018 • **Teaching Assistant** University of Pennsylvania, Philadelphia, PA., USA
- 2014 – 2015 • **Undergraduate Research Assistant** Rensselaer Polytechnic Institute. Troy, NY., USA.

Teaching Experience

- 2025 – Present • **Undergraduate: Core Courses Mechanical Engineering**
 - ENG 203: Dynamics (2) – Kuwait University
 - ENG 104: Engineering Graphics (3) – Kuwait University
 - ENG 201: Introduction to Design and Fabrication (3) – Kuwait University
- Fall 2023 • **Undergraduate: Mechanical Engineering**
 - ME 3017: System Dynamics – Georgia Tech *Teaching Practicum*
- 2021 – 2024 • **Undergraduate: Mechanical Engineering Research Advising**
 - Virtically Integrated Program – Georgia Tech

Research Interest

Robotics · Safety · Locomotion · Humanoids · Artificial Intelligence for Robotics
Motion and Path Planning · Social Robotics · Rough and Uneven Terrain

Research Publications

Journal Articles

- 1 W. Zhu, A. Raju, A. Shamsah, A. Wu, S. Hutchinson, and Y. Zhao, "Emobipednav: Emotion-aware social navigation for bipedal robots with deep reinforcement learning," *IEEE/ASME Transactions on Mechatronics*, pp. 1–13, 2026.  DOI: 10.1109/TMECH.2026.3653909.
- 2 Z. Gu, J. Li, W. Shen, *et al.*, "Humanoid locomotion and manipulation: Current progress and challenges in control, planning, and learning," *IEEE/ASME Transactions on Mechatronics*, 2025.
- 3 A. **Shamsah**, K. Agarwal, N. Katta, A. Raju, S. Kousik, and Y. Zhao, "Socially acceptable bipedal robot navigation via social zonotope network model predictive control," *IEEE Transactions on Automation Science and Engineering*, 2024.
- 4 A. **Shamsah**, Z. Gu, J. Warnke, S. Hutchinson, and Y. Zhao, "Integrated task and motion planning for safe legged navigation in partially observable environments," *IEEE Transactions on Robotics*, vol. 39, no. 6, pp. 4913–4934, 2023.

Conference Proceedings

- 1 A. **Shamsah**, J. Jiang, Z. Yoon, S. Coogan, and Y. Zhao, "Terrain-aware model predictive control of heterogeneous bipedal and aerial robot coordination for search and rescue tasks," in *2025 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2025, pp. 12 352–12 358.
- 2 K. Muenprasitivej, J. Jiang, A. **Shamsah**, S. Coogan, and Y. Zhao, "Bipedal safe navigation over uncertain rough terrain: Unifying terrain mapping and locomotion stability," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2024, pp. 11 264–11 271.
- 3 A. **Shamsah**, K. Agarwal, S. Kousik, and Y. Zhao, "Real-time model predictive control with zonotope-based neural networks for bipedal social navigation," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2024, pp. 13 741–13 748.
- 4 J. Warnke, A. **Shamsah**, Y. Li, and Y. Zhao, "Towards safe locomotion navigation in partially observable environments with uneven terrain," in *2020 59th IEEE Conference on Decision and Control (CDC)*, IEEE, 2020, pp. 958–965.
- 5 A. **Shamsah**, A. De, and D. E. Koditschek, "Analytically-guided design of a tailed bipedal hopping robot," in *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2018, pp. 2237–2244.

Workshop and Abstracts

- 1 J. Warnke, A. **Shamsah**, Y. Li, S. Coogan, and Y. Zhao, *Robust Locomotion Navigation in Partially Observable Environments with Safety Guarantees*. 2nd RSS Workshop on Robust Autonomy: Tools for Safety in Real-World Uncertain Environments (RSS 2020).
- 2 A. **Shamsah** and Y. Zhao, *Socially Acceptable Bipedal Navigation: A Signal-Temporal-Logic-Driven Approach for Safe Locomotion*. The 2nd Workshop on Social Robot Navigation: Advances and Evaluation, 2023.
- 3 A. **Shamsah**, J. Warnke, Z. Gu, and Y. Zhao, *Navigation in Dynamic Workspaces: Integrated Task and Motion Planning for Bipedal Locomotion*. Dynamic Walking, 2021.

Committee

- 2025 – Present
- **Research Committee.** Mechanical Engineering Department – Kuwait University.
 - **Workshop Committee.** Mechanical Engineering Department – Kuwait University.
 - **Student Professional Societies Committee.** ASME – Kuwait University.
 - **Kuwait National Robotic Competition Organization Committee.** Computer Science Department – Kuwait University.
- Spring 2025
- **Strategic Planning Committee.** Mechanical Engineering Department – Kuwait University.

Skills

- Languages
- Strong reading, writing and speaking competencies in English.
- Coding
- Python, C++
- Misc.
- Academic research and advising, $\LaTeX$ typesetting and publishing.

Miscellaneous Experience

Awards and Achievements

- 2017
- Honoured by His late Highness The Amir Sheikh Sabah Ahmad Al-Jaber Al-Sabah as one of the top 25 Kuwaiti sponsored students in US.
- 2014
- **Pi Tau Sigma;** Mechanical Engineering Honors Society, Top 20% of Class.
- 2013–2015
- **Dean List;** Rensselaer Polytechnic Institute Dean's List

Certification

- 2014
- **Certificate of Academic Merit.** Kuwait Ministry of Higher Education.