# AAE FALL COLLOQUIUM SERIES

# Safe Learning in Autonomous Systems

**THURSDAY DECEMBER 4, 2025**
**3:00PM-4:00PM ARMS B071**

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Abstract:
Learning-based control paradigms have seen many success stories with autonomous systems and robots in recent years. However, as these robots prepare to enter the real world, operating safely in the presence of imperfect model knowledge and external disturbances is going to be vital to ensure mission success. We introduce a class of distributionally robust adaptive control architectures that ensure robustness to distribution shifts and enable the development of certificates for V&V of learning-enabled systems. An overview of different projects at our lab that build upon this framework will be demonstrated to show different applications.

Biography
Naira Hovakimyan received her MS degree in Applied Mathematics from Yerevan State University in Armenia. She got her Ph.D. in Physics and Mathematics from the Institute of Applied Mathematics of Russian Academy of Sciences in Moscow. She is currently W. Grafton and Lillian B. Wilkins Professor of Mechanical Science and Engineering and the Director of AVIATE Center of UIUC. She has co-authored two books, eleven patents and more than 500 refereed publications. She is the 2011 recipient of AIAA Mechanics and Control of Flight Award, the 2015 recipient of SWE Achievement Award, the 2017 recipient of IEEE CSS Award for Technical Excellence in Aerospace Controls, and the 2019 recipient of AIAA Pendray Aerospace Literature Award. In 2014 she was awarded the Humboldt prize for her lifetime achievements. In 2015 and 2023 she was awarded the UIUC Engineering Council Award for Excellence in Advising. In 2024 she was recognized as the winner of the College Award for Excellence in Translational Research, and in 2025 she was recognized for Excellence in Graduate Student Mentoring. She is Fellow of AIAA, IEEE, ASME, IFAC, and senior member of National Academy of Inventors. She is a co-founder and chief scientist of Intelinair. Her work in robotics for elderly care was featured in the New York Times, on Fox TV, CNBC, and her recent NASA ULI award on flying cars led her to a live interview on Cheddar Innovates and many other media platforms. Her research interests are in control and optimization, autonomous systems, machine learning, neural networks, game theory, and their applications in aerospace, robotics, mechanical, agricultural, electrical, petroleum, biomedical engineering, and elderly care.

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