



# Learning and Robust Perception for Aerospace Autonomy

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## ABSTRACT

Onboard learning and robust perception can be generally viewed to characterize autonomy as overarching system-level properties. The complex interplay between autonomy and onboard decision support systems introduces new vulnerabilities that are extremely hard to predict with most existing guidance and control tools. In this seminar, we review some recent advances in learning-oriented and information-aware path-planning, sub-modularity metrics for non-myopic sensor scheduling, and covariance control for “plug-and-play” systems. The concept of “learning-oriented” path-planning is realized through certain new classes of exploration inducing distance metrics. These technical foundations will be highlighted through aerospace applications with active learning inside dynamic and uncertain environments.

## BIOGRAPHY

Maruthi Akella holds the Cockrell Family Endowed Chair in Engineering at UT Austin. His research encompasses coordinated systems, learning, adaptation, and vision-based sensing. His work received recognition through the AIAA Mechanics and Control of Flight Award, the AAS Dirk Brouwer Award, the IEEE-CSS Award for Excellence in Aerospace Control, and the Judith Resnik Space Award from the IEEE Aerospace and Electronic Systems Society. He is Editor-in-Chief for the Journal of the Astronautical Sciences and a Fellow of the AIAA, IEEE, and AAS.