Venkata Ramana Makkapati

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https://vrmakkapati.github.io/

EDUCATION

Doctor of Philosophy, Aerospace Engineering — Aug' 2016 - *Present*
Georgia Institute of Technology
Focus: Differential games, Optimal control under uncertainties, Autonomous vehicles, Hypersonic vehicles
Advisor: Prof. Panagiotis Tsiotras

Master of Science, Computational Science and Engineering — Aug' 2017 - Dec' 2019
Georgia Institute of Technology
Focus: Machine Learning

Master of Technology, Aerospace Engineering — July 2014 - May 2016
Indian Institute of Technology Kanpur
Focus: Flight Dynamics and Control
Advisor: Dr. Mangal Kothari

Bachelor of Technology, Aerospace Engineering — July 2010 - May 2014
Indian Institute of Technology Madras
Minor: Industrial Engineering

EXPERIENCE

Graduate Research Assistant — Aug' 2016 - *Present*
Dynamics and Control Systems Laboratory, Georgia Tech
Projects:
· Sensitivity-based analysis to mitigate for control design of hypersonic vehicles
· Safe, resilient and efficient operation of autonomous aerial and ground vehicles
· Optimal strategies for uncertain differential games with applications
Mentor: Prof. Panagiotis Tsiotras

Research Intern — May 2019 - Aug' 2019
Foresight AI Inc, San Jose, CA
Project: POMDPs and RL based motion planning and driving decision algorithms & software
Mentor: Dr. Matheen Siddiqui

Summer Intern — May 2013 - July 2013
Vehicle Integration Department, Mahindra & Mahindra, Chennai
Project: Approximation methods for the modal analysis of an exhaust system

Summer Intern — May 2012 - July 2012
Flight Mechanics and Control Division, CSIR-NAL, Bangalore
Project: Evaluation of free-to-roll test technique to study unsteady motions of an aircraft.
Mentor: Dr. Mallesh Bommanahal

ARTICLES

Safe Optimal Control under Parametric Uncertainties
V. R. Makkapati, H. Sarabu, V. Comandur, P. Tsiotras, and S. Hutchinson
IEEE Robotics and Automation Letters (RA-L), 2020

Optimal Evading Strategies and Task Allocation in Multi-Player Pursuit-Evasion Problems
V. R. Makkapati and P. Tsiotras
Dynamic Games and Applications, 2019

Nested Saturation based Guidance Law for Unmanned Aerial Vehicles
J. Patrikar, *V. R. Makkapati*, A. Pattanaik, H. Parwana, and M. Kothari
ASME Journal of Dynamic Systems, Measurement, and Control, 2019

Optimal Evading Strategies for Two-Pursuer/One-Evader Problems
V. R. Makkapati, W. Sun, and P. Tsiotras
Journal of Guidance, Control, and Dynamics (JGCD), 2018

A Comprehensive Differential Game Theoretic Solution to a Game of Two Cars
R. Bera, *V. R. Makkapati*, and M. Kothari
Journal of Optimization Theory and Applications (JOTA), 2017

Pursuit-Evasion Games of High Speed Evader
M. V. Ramana and M. Kothari
Journal of Intelligent & Robotic Systems (JINT), 2017

Pursuit Strategy to Capture High-Speed Evaders Using Multiple Pursuers
M. V. Ramana and M. Kothari
Journal of Guidance, Control, and Dynamics (JGCD), 2016

CONFERENCE PROCEEDINGS

Desensitized Trajectory Optimization for Hypersonic Vehicles
V. R. Makkapati, J. Ridderhof, P. Tsiotras, J. Hart, and B. van Bloemen Waanders
IEEE Aerospace Conference, 2021

Covariance Steering for Discrete-Time Linear-Quadratic Stochastic Dynamic Games
V. R. Makkapati, T. Rajpurohit, K. Okamoto, and P. Tsiotras
IEEE Conference on Decision and Control (CDC), 2020

C-DOC: Co-State Desensitized Optimal Control
V. R. Makkapati, D. Maity, M. Dor, and P. Tsiotras
American Control Conference (ACC), 2020

Sequential Auto-Landing of Multiple UAVs using Control Constrained Path Following
J. Patrikar, *V. R. Makkapati*, and M. Kothari
AIAA Guidance, Navigation, and Control Conference (GNC), SciTech, 2019

Trajectory Desensitization in Optimal Control Problems
V. R. Makkapati, M. Dor, and P. Tsiotras
IEEE Conference on Decision and Control (CDC), 2018

Pursuit-Evasion Problems Involving Two Pursuers and One Evader
V. R. Makkapati, W. Sun, and P. Tsiotras
AIAA Guidance, Navigation, and Control Conference (GNC), SciTech, 2018

Motion Planning for a Fixed-Wing UAV in Urban Environments
M. V. Ramana, S. A. Varma, and M. Kothari
IFAC Conference on Advances in Control and Optimization of Dynamical Systems (ACODS), 2016

A Cooperative Pursuit-Evasion Game of a High Speed Evader
M. V. Ramana and M. Kothari
AIAA Guidance, Navigation, and Control Conference (GNC), SciTech, 2016

A Cooperative Pursuit-Evasion Game of a High Speed Evader
M. V. Ramana and M. Kothari
IEEE Conference on Decision and Control (CDC), 2015

TALKS

Apollonius Allocation Algorithm for Heterogeneous Pursuers to Capture Multiple Evaders
Workshop on Heterogeneous Multi-Robot Task Allocation and Coordination, Robotics: Science and Systems (RSS), 2020

Optimal Strategies and Task Allocation in Multi-Pursuer Single-Evader Problems
International Symposium on Dynamic Games and Applications, 2018

SKILLS

Python, MATLAB, Simulink

SERVICE

Graduate Representative Jan' 2020 - *Present*
School of Aerospace Engineering Student Advisory Council, Georgia Tech

Consultative Group June 2019 - *Present*
Office of Principal Scientific Adviser, Government of India

Senator, Aerospace Engineering Jan' 2020 - Aug' 2020
Graduate Student Government Association, Georgia Tech

Reviewer
Automatica
IEEE Transactions on Automatic Control
IEEE Transactions on Robotics
IEEE Robotics and Automation Letters
Dynamics Games and Applications
Journal of Aerospace Information Systems
Journal of Air Transportation
International Conference on Robotics and Automation
IEEE Conference on Decision and Control
American Control Conference
AIAA Scitech Forum
Advances in Control and Optimization of Dynamical Systems

TEACHING

Graduate Teaching Assistant Aug' 2018 - May 2019
Optimal Guidance & Control, Multi-variable Linear Systems and Control

Teaching Assistant Aug' 2013 - May 2014
Flight Dynamics, Flight Stability & Control

EXTRA-CURRICULAR ACTIVITIES

Flying
Hold the *FAA Private Pilot* Certification (Aircraft Single Engine Land)

Long Distance Running
Bronze medal in the Dean's Trophy Road Race 2014 at IIT Madras

Team record for running the longest distance of 87 km on a treadmill in 6 hours at Treadathon 2014, Chennai.

National Cadet Corps (NCC)
Leading Flight Cadet with *B Certificate* in the NCC examination