

Cell: (505)-289-6384 Email: aby.vinod@gmail.com Webpage: abyvinod.github.io

LinkedIn: www.linkedin.com/in/abrahampvinod Github: <https://www.github.com/abyvinod>

EDUCATION	Postdoctoral Research Fellow 2019–current <i>The University of Texas at Austin</i> , USA Advisor: Dr. Ufuk Topcu Research focus: Data driven constrained autonomy with safety guarantees Doctoral student in Electrical Engineering 2014 – 2018 <i>The University of New Mexico</i> (UNM), USA GPA: 4.26/4.0 Advisor: Dr. Meeko M. K. Oishi PhD Thesis: Scalable Stochastic Reachability: Theory, Computation, & Control Research areas: Optimization (convex, discrete, and stochastic), control theory Bachelor & Master of Technology 2009 – 2014 <i>Indian Institute of Technology Madras</i> (IITM), India GPA: 8.59/10 Major: Electrical Engineering Minor: Biomedical Engineering Master Thesis: Deterministic Attitude Estimation
PROGRAMMING LANGUAGES	Proficient — Python, MATLAB Familiar — C, C++, HTML, CSS, Javascript
TOOLS	Git, Vim, Gurobi, Raspberry Pi, Resin, PhoneGap, Amazon Web Services
RESEARCH PROJECTS	Control of constrained stochastic systems ... April 2016 – December, 2018 ◦ Proposed optimization-based (convex and stochastic) for probabilistic safety guarantees in systems controlled by a human and/or autonomous agents ◦ Developed SReachTools, a repeatability-evaluated, unit-tested, open-source MATLAB toolbox (8,940 lines of code with 8,240 lines of comments) ◦ Used for obstacle avoidance, autonomous surveillance, and space applications Validation of cognitive models January 2015 – March 2016 ◦ Analyzed a cognitive model for the actions of an average human participant Deterministic attitude estimation for robotics May 2013 – June 2014 ◦ Designed an algorithm for orientation estimation (hardware validation)
INTERNSHIPS	Student Intern — R&D (Connected cars) Summer 2017 <i>Nissan Research Center — Silicon Valley</i> , Sunnyvale, California, US ◦ Developed location estimation techniques using CAN and GPS data for cars ◦ Created a Python-based workflow for secure over-the-air updates Interim Engineering Intern Summer 2012 <i>Qualcomm Incorporated</i> , Hyderabad, India ◦ Analyzed performance of the DRAM with the existing mobile platform builds ◦ Created a framework that sped up the debugging process by 30%
SCHOLASTIC ACHIEVEMENTS	◦ Best student paper award in the 20th ACM International Conference on Hybrid Systems: Computation and Control (HSCC), 2017 ◦ Prof. Achim Bopp prize for best student hardware project at IITM, 2014 ◦ Central Board of Secondary Education scholarship for undergraduate studies

SCHOLASTIC ACHIEVEMENTS (CONTD.)	<ul style="list-style-type: none"> ◦ Indian Institute of Technology Joint Entrance Examination All-India Rank of 709, where a total of 384,977 students gave the exam (in top 0.002%) ◦ All India Engineering Entrance Examination All-India Rank 609 and Tamil Nadu State Rank 18, where over 1 million students gave the exam (in top 0.001%)
PUBLICATIONS (SCHOLAR)	<p>1 book chapter, 2 peer-reviewed journal and 13 peer-reviewed conference papers, and submitted 3 journal and 4 conference papers for peer-review</p> <ul style="list-style-type: none"> ◦ A. Vinod, J. Gleason, M. Oishi, ““SReachTools: A MATLAB Stochastic Reachability Toolbox,” Hybrid Systems: Control and Computation, 2018 ◦ A. Vinod*, V. Sivaramakrishnan*, M. Oishi, “Piecewise-Affine Approximation-Based Stochastic Optimal Control with Gaussian Joint Chance Constraints,” American Control Conference (ACC), 2019 (* equal contrib.) ◦ A. Vinod*, S. Rice*, Y. Mao, M. Oishi, B. Acikmese, “Stochastic Motion Planning Using Successive Convexification and Probabilistic Occupancy Functions,” Conference on Decision and Control (CDC), 2018 (* equal contrib.) ◦ A. Vinod and M. Oishi, “Scalable Underapproximative Verification of Stochastic LTI Systems Using Convexity and Compactness,” Hybrid Systems: Control and Computation, 2018 (Finalist for best paper award) ◦ A. Vinod, B. HomChaudhuri, and M. Oishi, “Forward stochastic reachability analysis for uncontrolled linear systems using Fourier Transforms,” Hybrid Systems: Control and Computation, 2017 (Best paper award) ◦ A. Vinod, A. D. Mahindrakar, S. Bandyopadhyay, and V. Muralidharan, “A Deterministic Attitude Estimation Using a Single Vector Information and Rate Gyros,” IEEE/ASME Transactions on Mechatronics, 2015
RELEVANT COURSES	<p>Online: Machine learning, Optimization (convex and discrete), Game theory</p> <p>UNM: Probability and stochastic processes, Advanced calculus — I & II, Detection and estimation theory, Advanced probability theory, Complex systems theory, Multivariable control theory, Linear systems</p> <p>IITM: Computer Methods in Electrical Engineering, Nonlinear systems, Mechanics of Robotic Manipulators, Fundamentals of Medical Instrumentation</p>
EXTRA- CURRICULAR ACTIVITIES	<p>PhoneGap application May 2015</p> <ul style="list-style-type: none"> ◦ Created a Phonegap application to visualize personal mobility data ◦ Used MQTT and Amazon AWS to complete this project in two weeks <p>TATA EngiNX Innovation Challenge June 2013 – September 2013</p> <ul style="list-style-type: none"> ◦ Collaborated on an Android application to recognize American Sign Language <p>Android Application Development Summer 2013</p> <ul style="list-style-type: none"> ◦ Developed a test-taking application for the placement team of the institute ◦ Tested for Android 2.3 (Gingerbread) and above <p>Core member of Institute Electronics Club August 2012 – May 2013</p> <ul style="list-style-type: none"> ◦ Conducted three hands-on training sessions on development boards <p>FIRA Robosoccer World Cup October 2011 – August 2013</p> <ul style="list-style-type: none"> ◦ Led the Indian team in Robosoccer World Cup, 2013, held in Bristol, UK ◦ Implemented efficient control and communication protocols for the robots ◦ Used object-oriented programming in C++ for the robot control