

Taizoon Aliasgar Chunawala

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Education

Virginia Tech , Blacksburg, VA	Aug 2021 – Present
Ph.D., Mechanical Engineering	GPA: 3.85/4.00
<i>Relevant Coursework:</i> Adaptive Control, MPC for Agile Robots, Learning Theory for Dynamics	
University of Southern California , Los Angeles, CA	Dec 2019
M.S., Aerospace & Mechanical Engineering (Dynamics & Control)	GPA: 3.81/4.00
<i>Relevant Coursework:</i> Nonlinear Control, Robust Control, Multivariable Control	
BITS Pilani , Pilani, India	Jun 2016
B.E. (Hons.), Mechanical Engineering	GPA: 8.13/10

Research Experience

Graduate Research Assistant	Feb 2022 – Present
Agile Robots for Control, Optimization & Learning, Virginia Tech, Blacksburg, VA	
▪ Built a multi-rate NMPC framework enabling wall-supported bipedal locomotion on the Unitree Go2, achieving 13× higher traversal success compared to a Raibert heuristic controller.	
▪ Implemented a high-rate onboard state estimator fusing kinematics and IMU data to enable stable trotting in a dynamically unstable upright configuration.	
▪ Designed a Robust MPC controller for a wrist exoskeleton, improving tremor suppression and reference-tracking stability under real-time disturbances.	
Research Assistant	Feb 2020 – Dec 2020
Dynamic Robotics & Control Lab, University of Southern California, Los Angeles, CA	
▪ Implemented a direct collocation-based optimization solver for quadruped jumping on compliant terrain.	
▪ Validated optimal trajectories for an 18-DOF quadruped, achieving target jump height and stance-to-flight transitions in simulation.	
Research Assistant	May 2018 – May 2019
Autonomous Microrobotic Systems Lab, University of Southern California, Los Angeles, CA	
▪ Developed adaptive and predictive controllers for piezo-actuated flapping-wing micro-robots.	
▪ Implemented multi-frequency wing actuation in Simulink Real-Time for closed-loop flight experiments.	

Professional Experience

Control Engineer	Jun 2019 – Aug 2019
Polybee, Singapore	
▪ Built a vision-based UAV localization system achieving millimeter-level precision for autonomous pollination in vertical farming environments.	
▪ Integrated sensor fusion and Kalman filtering to enable smooth trajectory tracking in constrained indoor environments.	
Operations Manager	Jul 2016 – Nov 2017
Tata Steel Global Wires, Tarapur, India	
▪ Streamlined production scheduling across wire grades and gauges, identifying bottlenecks to improve line uptime and throughput.	

Technical Skills

Programming: C++, Python, MATLAB/Simulink

Robotics & Control: Model Predictive Control(MPC), Optimal Control, Kalman Filtering, State Estimation

Frameworks & Tools: ROS/ROS2, MuJoCo/Raisim, OpenCV, Linux, Git

Modeling & Design: SolidWorks, Dynamic Modeling, URDF

Selected Publications

T. Chunawala et al., "Robust Model Predictive Control of a Tremor-Suppression Exoskeleton under Tremor-Induced Disturbances," *In Review*, 2025.

B. M. Imran, J. Kim, T. Chunawala et al., "Safety-Critical and Distributed Nonlinear Predictive Controllers for Teams of Quadrupedal Robots," *IEEE Robotics and Automation Letters*, 2025.

L. Amanzadeh, T. Chunawala et al., "Predictive Control with Indirect Adaptive Laws for Payload Transportation by Quadrupedal Robots," *IEEE Robotics and Automation Letters*, 2024.

T. Chunawala, M. Ghandchi-Tehrani, J. Yan, "An Optimum Design of a Double Pendulum in Autoparametric Resonance for Energy Harvesting Applications," *Vibroengineering Procedia*, vol. 8, pp. 163–168, 2016.

Achievements

Pratt Fellowship, Virginia Tech (2021–22)

Top 0.1% in AIEEE (2012)

Formula Student Italy Representative (2014)