

Govind Chari

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Looking for GNC and simulation positions

EDUCATION

CORNELL UNIV.

GPA: 4.21 / 4.0

Mechanical Engineering
May 2022 | Ithaca, NY

LINKS

LinkedIn:// govindchari

Github:// govindchari

Website:// govindchari.com

COURSEWORK

Stochastic Controls (g)
Model-Based Estimation (g)
Feedback Controls (g)
Spaceflight Mechanics
Probability and Inference
Mechatronics
Dynamics
Mechanics of Materials
Fluid Mechanics
Heat Transfer

(g) indicates graduate coursework

SKILLS

SOFTWARE

Matlab • Simulink • C++
Python • ANSYS •
HOOTL/HITL Testing
Simulation • Flight Software
Solidworks (CSWA Cert)
HSMWorks

GENERAL

Controls
Dynamics
Estimation/Filtering
Orbital Mechanics
Autonomous Vehicles
Machining (Mill/Lathe)

HOBBIES

Tennis • Badminton
Stargazing • Hiking

EXPERIENCE

SPACEX | PROPULSION ANALYSIS INTERN

Jun 2021 - Aug 2021 | Hawthorne, CA

- Performed nonlinear structural and thermal analysis of Raptor and Merlin engines components using ANSYS and documented results for the responsible engineers
- Assessed multiple fluid fitting designs to mitigate flight risk for Starship orbital test flight
- Analyzed deflections in Raptor fuel turbopump housing at critical sealing surfaces
- Assessed gapping, structural margins, and fatigue life on Raptor high pressure lines
- Conducted modal and random vibration analysis on high pressure Merlin LOx line

CORNELL SPACE SYSTEMS DESIGN STUDIO | GNC ENGINEER

April 2021 - Present | Ithaca, NY

- Worked on the development of a high fidelity 6DOF simulation for [PAN](#)
- Tuned orbital rendezvous controller and worked on flight software implementation
- Conducted HITL and HOOTL tests to verify performance of orbital rendezvous controller and propulsion system
- Ran simulations to determine if deployment dispersions met our satellite's delta-v budget

PERSONAL PROJECTS

MPC IMPLEMENTATION OF G-FOLD | MARCH 2021-JUNE 2021

- Recreated Acikemese and Blackmore's powered descent algorithm
- Utilized lossless convexification and modified problem to help with feasibility
- Coded algorithm and a 6DOF simulation in C++ to verify robustness to disturbances
- Conducted Monte-Carlo trials to determine landing ellipse of the algorithm

VERTICAL TAKEOFF AND LANDING VEHICLE | APRIL 2020-AUGUST 2020

- Built and coded a vertical takeoff and landing vehicle powered by racing drone motors which utilizes servo driven thrust vectoring fins for attitude control
- Wrote GNC code from scratch using C++ including a Kalman Filter to fuse altimeter and accelerometer readings which reduced variance in altitude readings by 44%
- Designed and printed thrust test stand to accurately model the nonlinear thrust curve of racing drone motors and to measure the effectiveness of the thrust vectoring fins
- Conducted isolated unit tests to validate efficacy of the roll controller

3DOF TVC VEHICLE SIMULATION | DEC 2020

- Wrote a Simulink model to simulate the dynamics, controls, and state estimation for a 3DOF thrust vectoring vertical takeoff and landing vehicle
- Designed a full-state feedback for vehicle stability and trajectory tracking
- Implemented an Extended Kalman Filter for state estimation

6DOF TVC MODEL ROCKET SIMULATION | JAN 2021

- Derived equations of motion for a quaternion-based dynamics model
- Wrote 6DOF Simulink model of vehicle that accounts for real-world effects like actuator delay, TVC mount misalignment, and sensor noise
- Conducted Monte-Carlo simulations to determine dispersions from nominal trajectories

PROPULSION MODELING | DEC 2019 - MARCH 2020

- Derived governing equations and wrote Matlab model for combustion model that generates thrust and pressure vs time for given grain geometries
- Wrote Matlab script which used method of characteristics to generate the minimum length, shock-free nozzle contour
- Wrote 56-page document on compressible flows and nozzle design for my propulsion team