

Thomas Greenhill

(650) 269-7350 thomasvgreenhill@gmail.com

Personal Website/Portfolio: <https://www.teawiththomas.com/>

Summary

I'm an Autonomy and Flight Research Control Systems software engineer leading control systems at Joby Aviation. I'm an expert in developing specialized software for modeling, simulation and control of unstable aircraft, including outer-loop guidance and basic autonomy. I am an avid glider pilot with several US National champion titles and over 1000 flight hours.

Education

University of California, Davis

September 2017-June 2021 (intended)

- B.S. in Aerospace Engineering, BS. in Mechanical Engineering, Upper Division GPA 3.88/4.0, Dean's Honor List.
- Member, UC Davis Tau Beta Pi (top 8% of UCD College of Engineering)
- Relevant coursework: Optimal Robust Control (graduate-level courses with emphasis on MIMO applications), Estimation Theory and Design (graduate-level courses), Mechatronics Systems, Stability & Control of Aerospace Vehicles, Automation & Control, Mechanical Design, Thermo-Fluid Dynamics, Heat Transfer, ...

Skills

- Software: fluency in C++, Python, MATLAB, [Bazel build](#). Numerical methods with [Eigen](#), messaging with [Cyclonedds](#)
- Computer graphics: High-performance and real time visualization of time domain simulation data ([Panda3d](#))
- Numerical methods: Discrete adaptive solutions to systems of ODE's including rotations (quaternions)
- System ID: Frequency and time domain system ID, open and closed loop characterization, margin determination.
- Fluid Dynamics, Vehicle Dynamics, and Simulation Tools: AVL, XFOIL, SIDPAC, XFLR5, Star CCM+, Solidworks FEA.
- 2D/3D CAD Software: SolidWorks, Autodesk Fusion, Corel Draw, Adobe Illustrator
- World languages: Bilingual fluency in French
- Leadership: Joby aviation: flight research control systems lead. Truckee Tahoe Soaring Assn: Board of Trustees

Experience

Autonomy and Flight Research Control Systems Software Engineer

August 2021 - Present

- Led simulation and control systems development for new configurations, including fully unstable and highly coupled aircraft. Basic autonomy: waypoint tracking, airspeed/altitude control, automatic mode switching.
 - Led development of model-based controllers (C++) for stabilization of fully unstable/highly coupled aircraft.
 - Led outer-loop control development for automatic path following and basic autonomy.
 - Led multi-body simulation efforts, including simulation software architecture, modeling of electrical/electro-mechanical and mechanical systems, aerodynamics, wrote a high performance quaternion library.
 - Developed aerodynamic modeling tools (AVL interface) for simulation and performance analysis.
 - Developed linear analysis tools for open and closed loop modal analysis and visualization.
 - Performed closed-loop system ID for stability characterization and margin calculation.
 - Developed multi-body simulation visualization with [Panda3d](#).
 - Fleshed out unit testing framework with [Pybind11](#) and [Hypothesis](#) to validate modes and control algorithms.

R&D Engineering Intern, Dynamic Systems Modelling Intern, Kitty Hawk Corp.

June-September 2020

- Developed system identification solution for transfer function, stability derivative and aero-coefficient estimation.
 - Created MATLAB toolbox to pipe flight test data into SIDPAC, produced validated models.
 - Wrote Python wrapper to access AVL and implement numerical methods for simulation and validation.
- Independently developed electric self launch system for Windward Performance SparrowHawk sailplane.
 - Designed and analyzed battery, motor and motor controller structure with extensive use of Solidworks CAD and simulations, manufactured and integrated carbon fiber, CNC machined aluminum and 3D printed parts.
 - Designed, analyzed, integrated & tested components. Performed ground tests and developed flight-test plan.

Co-Founder & Principal Engineer, Epic Aerospace, Inc.

June-October 2019

- Developed the first prototype of CHIMERA A. Space Tug.
- Pitched engineering & business model to investors, raised funds for further development.