NICHOLAS TUCKER

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ABOUT

A systems engineer with a broad range of experience designing, building, testing, and analyzing high-performance vehicles looking for new challenges. Equipped with a proven record for identifying issues in complex systems and leading projects to develop solutions.

EXPERIENCE

American Robotics, Waltham, MA **Jan. 2022 – Jan. 2023**
Senior Systems Engineer

- Developed OpenMDAO Python system model to explore designs and make trade studies.
- Conducted tests and analyzed data to create and validate rotor, motor, and battery models.
- Created framework for automated scoring / analysis of flight test data.

X / Google X, Various Locations **Dec. 2014 - Jan. 2021**
Senior Systems Engineer - Makani Project, Dec. 2016 – Jan. 2021

- Created a comprehensive system analysis tool for Google's airborne wind turbine project – a 25m wingspan carbon-composite 1 MW multi-rotor kite that produces energy.
- Key architect and contributor for Python system model (~12k lines of code) that evaluated concept economics and optimized cost, mass, and performance for conceptual designs.
- System performance expert, responsible for trade studies and analysis of performance related hardware and software changes.
- Author of 130-page paper on kite energy performance. Speaker at AWEC conference.
- Developed accurate and fast performance model for use in system optimization. Optimized flight strategies were then implemented in controller and successfully flown.
- Systems work led to pivot of company to identified offshore deep-water opportunity.

Airframe Engineer - Makani Project, Dec. 2015 – Dec. 2016

- Designed and tested emergency landing gear system in 5 months. Gear saved 2 airframes.
- Self-initiated project to evaluate concept viability, becoming system performance expert.

Wing Structure Lead - Titan Aerospace Project, Moriarty, NM, Dec. 2014 – Dec. 2015

- Led conceptual design of lightweight composite wing structure for a high altitude solar powered UAV intended to fly for months at ~60k ft as a communications platform.
- Created aircraft configuration tool for initial airframe sizing for 2nd gen prototype, identifying critical system performance parameters, trades, and flight strategies.
- Completed conceptual design of main wing spars, selected main spar supplier, managed build of prototype test spars.
- Designed and tested wing joiners for 135 ft wingspan 1st gen prototype in 3 months.

Global Flight Systems, Waltham, MA **Feb. 2014 - Dec. 2014**
VP Engineering / Co-founder

- Co-founder, engineer, and manager for an early stage (< 5 employees) startup developing a high altitude solar powered UAV capable of sustained flight over a year.
- IP and employees were acquired by Google < 1 year after founding.
- Team built a prototype that became the 4th in the world with an electric flight >24 hours.

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Terrafugia, Woburn, MA **June 2011 – Mar. 2014**

Senior Vehicle Engineer, April 2013 - April 2014

- Project lead on numerous systems for a startup aviation company designing a flying car designed to meet light sport aircraft (ASTM F2245) and FMVSS standards.
- Initiated and led selection of new composite material systems, and FEA analysis packages.
- Managed external contracts for FEA analysis of crash structures.
- Crew Chief responsible for aircraft during first public flight of vehicle at OshKosh AirVenture.
- System lead for Passenger Safety Systems and Interior Components.

Vehicle Engineer, June 2011 - April 2013

- Project lead for drive test program. Planned, prioritized, and documented drive test events.
- DARPA TX Sub-contractor. Completed early-stage design of “flying Humvee” concept wing.
- Programmed and validated MATLAB model to analyze front suspension dynamics.
- Designed, prototyped, and tested interior impact systems to meet car crash standards.

United Technologies, Various Locations **June 2008 - June 2011**

Engine Center Process Engineer, Pratt & Whitney, June 2010 – April 2011

- Owner of assembly methods for low pressure turbine and exhaust case sections.
- Implemented new and overhauled tooling for JSTARS re-engining program.

Operations Leadership Program, Various, June 2008 – June 2010

- A competitive two-year rotational program designed to rapidly gain varied operations experience across manufacturing, supply chain, and quality roles.

EDUCATION

BS in Mechanical Engineering, Columbia University
School of Engineering and Applied Science, New York, NY

Chief Engineer, Formula SAE: Led team of 15 designing, building, and testing a single-seat race car.
1st Place Senior Design: Our group designed and built a mechanical regenerative braking bicycle.
James F Parker Award: Awarded to the student that has distinguished themselves as a designer.

Professional Courses
Google Machine Learning Intro — Structural Adhesive Analysis — Hypersizer

CORE COMPETENCIES / SKILLS

Python and Data Analysis	System Modeling / Analysis	Conceptual Design
Composite Design	Part & System Testing	Wind Energy System Analysis
Project Management	Solidworks CAD & FEA	Aircraft & Vehicle Systems