ANCIL MARSHALL

Senior Guidance Navigation and Controls Engineer

Guidance Navigation and Controls

Aircraft, Spacecraft, Orbital Dynamics | Modeling and Simulation

49 years old
- Boston (02108) United States (Massachusetts)

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Senior Guidance, Navigation and Controls (GNC) Engineer with over twenty years of experience specializing in aircraft, missiles, launch vehicles, space vehicles and commercial drones. Expert in a wide-range of GNC responsibilities such as the modeling of aerospace vehicles, the design and analysis of feedback control laws, the development of guidance algorithms, the analysis of mission performance via simulations, the support of vehicle integration tests and on-site, in-field flight activities.

Strong project management skills demonstrated by leading various programs and heading up small multi-disciplinary teams for diverse projects. Firmly believes in team development through collaboration, training and mentoring.

Open to new opportunities in a GNC flight controls group where I can leverage my experience to ensure the success of challenging projects.

EXPERIENCES

Senior Guidance Navigation and Controls Engineer

Aurora Flight Sciences - Since June 2019 - Boston, MA

- GNC Lead for a Boeing 777X autonomy project. Manages a small team of GNC and Software Engineers to develop an independent autonomy, autoflight and primary controls function to aviate the 777X.
- Designs SISO and LQR controllers, as well as guidance algorithms for the 777X using Model Based Design (MBD) in Matlab/Simulink. Applies DO178C and DO331 standards. Auto-generates and implements code into 777X nonlinear desktop and cab simulator.
- Performs 777X GNC controller architecture designs using Model Based System Engineering (MBSE) techniques to meet operational and safety requirements.
- Leads customer interactions on the 777X project (e.g., demos, on-site meetings). Manages project milestones, schedule and agile sprints. Coaches team members.
- Lead GNC Engineer for Centaur - an autonomous, optionally-piloted, twin-engine airplane for ISR operations.
- On Centaur, works with multi-disciplinary team to plan flight tests, post-process flight data and resolve flight anomalies.
- Works with Centaur Chief Engineer to define requirements and statement of work for the vendor-supplied GNC controllers and guidance algorithms.
- Lead GNC Engineer for an Urban Air Mobility eVTOL project. Lead team of two GNC engineers during preliminary studies, derived nonlinear hover equations, designed LQR controller and performed rotor failure study.

SKILLS

Aerospace Engineering

- Classical, Robust, Optimal, Nonlinear Control Theory ★★★★☆
- Aircraft, Missile and Spacecraft Dynamics ★★★★☆
- Guidance Algorithms Design and Analysis ★★★☆☆
- Orbital Mechanics and Astrodynamics ★★★★☆
- Digital Signal Processing abd Filter Design ★★★☆☆
- Navigation, Kalman Filtering, and Sensor Fusion ★★★☆☆

Software Enginering

- C/C++, Python, Object Oriented Design ★★★☆☆
- Matlab, Simulink, Stateflow, DO-178C toolchain ★★★★☆

Systems, Safety and Certification

- ARP 4754A and 4761 Aircraft Safety Design and Certification
- DO178C and DO331 Software Development
- MBSE and MBD Development

INTERESTS

Sports

Squash, Football. Salsa and Kizomba Dancing

Guidance Navigation and Controls Engineer

Parrot

Parrot - November 2017 to May 2019 - Paris - France

- Researcher and developer of future guidance algorithms for Parrot's Drones. Simulated proof of concept guidance algorithms in Matlab and Python.
- Implemented proof of concept guidance algorithms in C/C++ embedded software on the Bebop 2 and Anafi drones.

Software Engineer - iOS (iPhone/iPad) applications

BIOSERENITY

Bioserenity - November 2015 to July 2017 - Paris - France

- Software Lead of the iOS mobile application for the Neuronaute - a wearable connected medical device to detect epilepsy. Deputy lead of the mobile group of eight developers.
- Implemented new functions using existing application architecture and libraries (BLE, TCP/IP, database, GUIs).
- Improved stability of TCP/IP connection and debugged race-condition. Developed real time graphics library. Reduced CPU usage by 50%.

Senior Guidance Navigation and Controls Engineer

Orbital ATK

Orbital ATK (Northrop Grumman) - April 2005 to July 2013 - Chandler, AZ

- GNC Engineer on GQM-163A missile. Managed linear analysis tools, conducted nonlinear 6DOF simulations in C++, performed vehicle integration tests, investigated flight anomalies and recommended software fixes.
- Lead GNC Engineer for High Diver variant of GQM-163A. Performed GNC design from the initial concept to the eventual launch.
- Lead GNC Engineer on FFMS variant of GQM-163A and traveled to Ile du Levant, France with multi-disciplinary team to perform launch operations.
- Parameterized GQM's time-scheduled flight gains to a Mach and mass-based adaptive algorithm.
- Developed various guidance algorithms for the High Diver variant of GQM to improve its performance and robustness.
- Created Simulink model of the High Diver gas generator, which successfully matched motor tests.
- Worked with aerodynamics group to simplify a 5D High Diver model into a 2D model in order to embed the reduced model in flight software.
- Performed independent reviews of the Minotaur I, Pegasus and Antares space launch vehicles, the Orbital Boost Vehicle, and the Patriot Target Vehicle.
- Lead GNC Engineer for the Zombie Pathfinder program, a single-stage and a two-stage ballistic missile for NASA's Sounding Rocket Program. Performed initial design trade studies, improved 6DOF nonlinear simulations.
- Mentored other engineers in GNC and C/C++ 6DOF simulation. Taught GNC course to a group of forty engineers.

EDUCATION

Robust and Adaptive Control

BOEING TRAINING

April 2020 to June 2020

Robust and Adaptive MIMO control course featuring Optimal Output Feedback Control with Loop Transfer Recovery.

Simulink Coder and Polyspace

THE MATHWORKS

November 2019

5 day training course on generating C code from Simulink and Stateflow Models, as well as Polyspace Bug Finder and Code Prover.

Robust Control Theory

SAFRAN TRAINING

October 2018

5 day course on classical feedback control, modern robust control including small gain theorem, H-infinity, loop-shaping and mu-analysis.

Master's of Aeropace Engineering

GEORGIA INSTITUTE OF TECHNOLOGY, ATLANTA GA

2000 to 2002

Bachelor's of Aerospace Engineering

GEORGIA INSTITUTE OF TECHNOLOGY

1997 to 2000