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## **Summary**

I want to apply my diverse experience base in an entrepreneurial aerospace environment, especially in GN&C, where I have expertise in modeling and simulation.

## **Aerospace Skills (gained principally through NASA Glenn Research Center, Cleveland OH)**

- Reverse-engineered spacecraft attitude control components, such as attitude estimators, momentum wheels, propellant slosh and reaction thrusters, to first principles.
- Developed multivariable planar launch vehicle simulation from scratch, using EASY5 and Matlab. Performed many types of analysis to ascertain effects on launch vehicle autopilot.
- Designed an artificial neural network to position solar arrays for a space platform.
- Developed a rigid body 3D math model of a space platform with solar arrays, from scratch.
- Led spacecraft simulation projects involving two to five engineers.

## **Robotics Skills (gained principally through GreyPilgrim Inc., Rockville MD)**

- Assisted in assembly of flexible manipulators and test beds.
- Organized and carried out tests in loads, dynamics, vibrations and control. Performed analyses in support of these tests, and delivered test reports worth \$500K to the company.
- Developed mathematical models of manipulator and robotic platform.
- Coded manipulator model in C for use in LabVIEW-based control system.

## **Classroom Skills (gained principally through the College of New Jersey, Ewing, NJ)**

- Author of e-book “Rhetoric for Engineers,” including several hundred pages of class notes and experience.
- Advisor and micropatron for several small companies started by former students.
- Led the formation of a control system Design Guide for my NASA organization.
- Experienced in classroom for Algebra, Geometry, and SAT Prep.

## **IT Skills (acquired in several positions)**

- Maintainer of “the Engineer’s Companion,” for over 12 years one of the most respected engineering reference Web sites in the world.
- Developed several Java applets, including one for finding reactions to forces applied to a pattern of fasteners.
- Developed a framework with C language used as CGI for a customer database for a maker of storage systems.
- Reworked Web site for the Sky Scrapers Academy coaching organization
- W3 Schools certification in HTML, XHTML and CSS; ODesk Web design certification in XHTML (top 10%), CSS (top 20%), HTML, JavaScript.

## **Education**

- BS/MS, Mechanical Engineering, University of Akron, 1982/84.
- Doctor of Engineering, Cleveland State University, 1994.
- Certificate of Eligibility in TESL Program, the College of New Jersey, 2005.

## **Detailed knowledge of spacecraft attitude control system design**

Advanced Communications Technology Satellite (ACTS), NASA Glenn Research Center, 1988-1991

- Modeling of momentum wheel for yaw/roll attitude control (through speed control)
- Modeling of magnetic torquer pulse-width modulation system for yaw/roll control
- Modeling and verification lead for sixth-order yaw estimator – a type of Kalman filter used to approximate yaw attitude without the Sun; some solid modeling (in I-DEAS) was also required
- Modeling and verification lead for propellant slosh effects during ACTS spin-up for transfer orbit operation
- Trade studies involving temporarily loss of Sun position, misfiring of reaction thrusters, and momentum wheel misalignment

Space Station Freedom program, NASA Glenn Research Center, 1991-1994

- Modeling of rigid multibody space platform dynamics for simulation of large angle solar array motions
- Modeling of reaction control thruster system for attitude control studies
- Modeling and verification lead for Shuttle proximity operations
- Trade studies involving temporary loss of array joint control or other unexpected on-board disturbances

## **Working knowledge of Matlab/Simulink, C/C++, and MS Office tools**

- Although much of my simulation work was done with EASY5 – I am probably one of a handful of people in the USA with my level of familiarity with EASY5 – I have also performed simulations with several other tools, including several months with Matlab/Simulink. I have also used Matlab without Simulink, ACSL, Java and even Excel in performing analysis and simulation.
- Microsoft Office Specialist certificates in Word, Excel and Powerpoint; International Computer Driver's License; ODesk desktop certification in Windows XP (top 10%), PowerPoint (top 10%), Excel (top 20%)
- I have used both C and C++ in the design of a form response system for visitors to my Web site to add links to (and descriptions of) their own favorite sites. I have C and C++ certificates from America Online.

## **Good communications skills**

- For eight years I taught Rhetoric and Academic Writing to freshman students at the College of New Jersey. For five of those years most of my students were working toward engineering degrees. My work with them has led to a 300-page e-book, *Rhetoric for Engineers*.
- More recently I have been working with student entrepreneurs, offering encouragement, guidance and exposure through my *start me up!* blog and podcasts.
- ODesk certification in organizational behavior (top 10%), telephone etiquette (top 10%), English sentence structure, editing skills, technical writing skills, e-mail etiquette, and online article writing/blogging (all top 20%); Brainbench certification in business writing (98 percentile)
- Prepared business plan for the Devotional Chef start-up