Gregory Kealoha Fricke

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Objective

I seek employment as a controls and systems engineer, with emphasis on the design, implementation, and testing of complex systems. I seek this position exclusively in dynamic environments that require creativity and innovation to face new engineering challenges.

Experience

Graduate Research Assistant January 2007 - present
Duke University Durham, NC 27708

- Designed and conducted experiments involving multiple robot agents. Employed iRobot Create ground vehicles and Parrot AR.Drone and Skybotix CoaX aerial vehicles. Developed controllers for Gumstix Verdex and Overo, Dell Netbook, Commell LP-170, and custom assembled onboard computers. Installed the active infrared tracking system TrackingTools from NaturalPoint.
- Lab manager for Robotics and Manufacturing Automation Laboratory (RAMA Lab). Managed $70k hardware budget. Specified and procured robots, computers, and supporting hardware to implement multi-vehicle laboratory space. Developed metrology software to work with tracking system.
- Designed and patented automation system and RootArray hardware with Systems Biology department.

Engineer/Scientist II August 2003 - December 2006
Boeing-SVS, Inc. Albuquerque, NM 87109

- Responsible for design, implementation, and testing of control systems for prototype and proof-of-concept systems. Primary focus on inertial stabilization of small- and large-angle optical gimbal systems for aerial and ground vehicles. Performed structural and modal analysis of various complex systems for characterization of vibration, acoustic noise, and base jitter profiles.
- Installed and maintained real-time Linux (RTAI) operating systems on conventional and embedded computing systems for lab and field testing. Wrote device drivers for I/O hardware interfaces. Implemented soft- and hard-real-time digital control using both COTS and custom embedded processing systems. Implemented control and hardware interface software for WindRiver VxWorks. Extensively used MATLAB/Simulink tools for design and rapid deployment. Designed and implemented S-functions and device drivers in C. Designed, wrote, and maintained user-interfaces for lab and field systems in MATLAB, Java and Tcl/Tk.

Engineer/Scientist II June 2000 - July 2003
Hughes Space and Communications El Segundo, CA 90245
Boeing Satellite Systems

- System Engineer for Attitude Control subsystems of the next-generation geo-synchronous satellite programs Spaceway and Wideband Gapfiller System. Developed, critiqued, and tested control algorithms used in the Spacecraft Control Processor (SCP) for satellite attitude control and fault monitoring.
- Tested and debugged ADA83 flight software at unit level. Implemented and documented standard procedures for real-time, Mixed Simulation Testing (MST), reducing recurring costs of validation on future programs. Developed tools to generate unit tests and MST test profiles in Matlab and MS Excel. Proposed and developed automated regression testing tools. Created tool to auto-generate formal test descriptions based on test scripts. Modified existing tools written in C to automatically generate telemetry databases and memory maps upon delivery of new software builds. Investigated and debugged test environment failures and anomalies (s/w and h/w, simulation and flight code).
- Led four person team in expedited re-qualification of Galaxy IIIC satellite flight software.
- Responsible Engineering Authority (REA) for hardware-in-the-loop MST station for Thuraya D2 and Anik F2 satellite programs. Debugged and repaired hardware and software faults. Specified, inspected, and documented required changes to hardware for new configurations. Implemented, updated, and maintained simulation software in response to Engineering Change Requests, Software Change Requests, Problem Reports, and Test Anomalies.

Intern, Machinist March 1999 - August 1999
Frontier Technologies Gardena, CA 90248

- Programmed and operated CNC vertical mills and lathes as well as other typical machine shop tools. Work with many grades of steel, stainless steel, aluminum, and synthetics. Familiar with FANUC CNC standard. Experience with Pro-E and MasterCAM software for tool path generation.

System Engineer, Data Analyst June 1996 - September 1998 (Intermittent)
Rockwell Power Systems Maui Space Surveillance Site, Haleakala, HI
Rocketdyne Technical Services Air Force Maui Optical Station, Kihei, HI

- System engineer for Raven deployable telescope system. Identified control interface requirements, and implemented hardware and software interface by modifying existing COTS solutions to minimize costs and simplify maintenance.
- System engineer for Advanced Electro-Optical System (AEOS) 3.67m telescope at Maui Space Surveillance Site (MSSS) on Mt. Haleakala. Optimized camera operation for adaptive optics by writing automation, control and interface software in C and Pascal. Controlled camera imaging properties and external shutter. Implemented controllers for IRIX, Windows95/NT, and Macintosh.
- Data analyst for Planetary Defense, Orbital Debris Tracking, and Near Earth Asteroid Tracking (NEAT) programs sponsored by the Jet Propulsion Laboratory (JPL). Used Image Reduction and Analysis Facility (IRAF) software as well as customized image processing software.

Education

Ph.D. Mechanical Engineering January 2007 - September 2013 (expected)
Duke University Durham, NC
Thesis: Distributed Control of Heterogenous Mobile Robotic Agents in the Presence of Uncertainties

M.S. Mechanical Engineering January 2007 - April 2009
Duke University Durham, NC
Thesis: Localization, Tracking, and Odometry Calibration of a Multi-Agent Swarm System

Continuing education Fall 2004
University of New Mexico Albuquerque, NM
Signal processing, taught by retired Boeing Technical Fellow.

B.S. Mechanical Engineering September 1996 - June 2000
California Institute of Technology Pasadena, CA
Kinematics, engineering design theory, robotics (navigation, manipulation, and grasp theory), sequential programming, optical engineering, control theory, astronomy, and theoretical physics.

Computing Skills & Experience

Languages:
C/C++, Python, Matlab, SH/BaSH/CSH, Java, Tcl/Tk, ADA83, FANUC

Development packages:
Robot Operating System, OpenCV, TrackingTools

Operating systems:
Linux (RTAI, OpenEmbedded, Angstrom, Ubuntu, Debian, Fedora), HP-UX10, IRIX, AIX, SunOS, Microsoft Windows, WindRiver VxWorks

Engineering software:
Matlab, Simulink, Mathematica, Adsim, SolidWorks, Pro-E, I-DEAS, AutoCAD, MasterCAM, EPOCH/ISIS, TrackingTools, IRAF

Office software:
LaTeX, MS Office, Adobe Acrobat, Adobe FrameMaker, MS Project