Kyle R. Hess

Huntsville, AL | kyleRhess.github.io | kylehess.r@gmail.com

Professional Experience

10/2021 - Present | Electrical Engineer II | Dynetics Inc.

Reverse Engineering & FME

- Work with multiple small teams to reverse engineer mixed signal circuit boards and systems, identify unknown components and understand the designs from the low-level circuitry to the complete system
- Contribute to deliverable milestone reports that provide project status updates to customers and other project contributors. Reports include threat system findings and testing methodologies.
- Utilize some threat hardware designs to reproduce circuit boards for customer replacement hardware

Hardware Design & Testing

- Create electrical schematics using Dx Designer and collaborate with the PCB layout team to produce complete PCBA design packages for boards that incude digital, analog and RF signals up to 12 layers
- Produce system block diagrams and chassis cable assembly drawings in Visio for top-level integration
- Develop supporting hardware with our HITL team to interface between simulation computers and various threat systems to permit the inclusion of real threat hardware in simulation loops
- Conduct bench testing of threat hardware and original designs to verify assumptions and simulation results
- Apply internal Agile PLM tools and processes to track the release of parts and drawings as well as engineering change orders and deviations for controlling revisions of these items

09/2017 - 09/2021 | Electrical Engineer | Gladiator Technologies & LKD Aerospace

- Created and managed electrical schematics, circuit board layouts, board revisions and BOMs with OrCAD
- Worked with a small team to develop and debug firmware for IMUs and Inertial Navigation Systems (INS)
- Collaborated with a contracted team of experts to write and integrate a new 15-state Extended Kalman Filter into a legacy INS/GPS design which resulted in a 10x improvement in "free-inertial" navigation performance
- Supported custom C++ Windows applications for production testing and calibration
- Rewrote our data processing system using Python to replace cryptic Excel macros and support new products
- Tracked all product development progress through phase-gates per AS9100D quality management system
- Managed prototype builds from system design to part procurement to final compliance testing
- Supported customers with application engineering challenges during IMU integration (remotely and directly)
- Wrote and maintained product Datasheets, User Guides, Technical Summaries and Reference Manuals

Skills & Abilities

Electronics: Experience with SPI, UART, RS-485 and USB interfaces, 32-bit microcontrollers (STM32 & NXP K22), schematic design & capture, PCB layout, CAD/EDA library management, component selection and soldering
Lab Equipment: Oscilloscopes, DMMs, function generators, power supplies and spectrum analyzers
Software: Dx Designer, KiCAD, Visual Studio, Git, LTSpice, OrCAD, NI Multisim, Smartsheet, AutoCAD
Programming: C, C++, Python, MATLAB, C#, JavaScript, Arduino and System Verilog

Personal Projects

eBike Motor Driver (01/2022 - ongoing)
Efficient servo driver for a 3-phase brushless DC motor. Utilizes phase current sensing and incremental encoder feedback to control the 3-phase currents for optimal rotor torque with space vector modulation. Cascaded PID controllers allow for precise speed and position control with an encoder resolution of 0.26 mrad.
This motor drive was then successfully used as the controller for a 1.5 kW eBike hub motor.

Education

University of Washington, Seattle, WA | Bachelor of Science in Electrical Engineering (2017)

Olympic College, Bremerton, WA | Associate of Science (2015)