JONATHAN REYNOLDS

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I am currently working for Modis, a division of Adecco, at Woodward developing end of line (EOL) test stands for aircraft Thrust Reverser Actuation System (TRAS) components. My focus has been creating the software architecture and developing software for the hydraulic power unit (HPU) and TRAS actuator test stand. The software is primarily VeriStand with control modules written in LabVIEW. This software integrates with TestStand for test sequence control per the given part's Acceptance Test Procedure (ATP). I have helped design and review the electrical system which encompasses the real-time (RT) controllers and over 200 sensors and actuators. I have also used my hydraulic experience to help with the hydraulic system design for the HPU and TRAS actuator automated test equipment. This is a contract position for the development of these test systems. I have enjoyed the development and learned much about project scheduling and prioritization.

Formerly, I was the Lead System Architect at Lightning Systems (previously Lightning Hybrids) in Loveland, CO. I started in 2010 as the only controls engineer and developed the control system for our first production prototype. Since then, I managed the controls engineering group as we continued to grow and innovate. I enjoy working with a team of intelligent engineers, developing and improving new technology. Under my direction, the controls team and I created a secure WIFI service-tool HMI and over-the-air remote update system. We implemented an extensible real-time error handler with actions and persistence specific to individual errors. We also created torque control algorithms to improve fuel and emissions results.

I performed many engineering tasks as well as management, which allowed me to maintain a high overall system understanding. I have programmed in LabVIEW and C for embedded systems. I created a custom controller for Lightning with a 6-layer PCB that incorporates DI, PWM DO, AI, AO, SPI, CAN, Ethernet, TVS, an accelerometer, and a crypto chip. It utilizes a System-On-Module (SOM) from National Instruments which incorporates a Xilinx Zync SOC that contains a Xilinx FPGA and dual-core Arm A9 processor on the same chip. The FPGA safely manages outputs and provides serial drivers and input filtering.

While studying for my bachelor's degree in Mechanical Engineering, I focused on controls which includes software and electronics as well as the mechanical aspects of complex systems. The M.E. background provides me with a unique perspective that allows me to better understand intricate systems. For my senior design project, I used a LADAR (aka Lidar) for mapping on a search and rescue robot. More recently, because I always love learning about new topics, I have started an online MBA program which I expect to complete by the end of 2019. The MBA will complement my strong engineering background well.

I have become interested in software defined radio (SDR) as a hobby. I am working on an SDR based FMCW (frequency modulated continuous wave) radar. I hope to increase the resolution and use it for SAR (Synthetic Aperture Radar) and iSAR 3D imaging. With enough resolution, I hope to be able to determine breathing and heart rates as well. I am excited to follow it up by building a 2.4 GHz passive through-the-wall radar that can map both static and dynamic objects through walls.

In my personal time, I love making and fixing things such as phones, computers, cars, and houses. I converted an old Toyota pickup truck into an electric vehicle. It uses a cheap DC motor and lead-acid batteries. I used the experience to learn about energy storage and motor control electronics. My first house was a foreclosed four-plex that I remodeled and upgraded. At my current house, I finished the basement mostly myself, working on the electrical, plumbing, framing, trim, drop ceiling, and built a hidden bookcase door to the storage room.

I also enjoy spending time with my family biking through town and hiking in the mountains. At my church, I have been a deacon for 10 years, helping with computers and building technology. I have been a soundman for 15 years, and I co-lead a Bible study. I have played bass and taught Sunday school. I enjoy judging high school robotics competitions. I love seeing young people learn programming and electronics and how to overcome obstacles.

For more details on my personal projects, see my website at resume.jonandco.com.
I would love the opportunity to further discuss how I could be a great fit and beneficial employee.

Thanks,
Jonathan Reynolds

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Experienced manager and intelligent engineer that thrives in both collaborative and independent tasks, focusing on innovation and creative problem solving with a specialty in control systems, hydraulics, and embedded design.

EXPERIENCE

SENIOR APPLICATIONS ENGINEER, WOODWARD/MODIS (FORT COLLINS, CO) **2/2018 – Present**

True North Test Systems Group – Automating Test Stands for Aircraft TRAS Actuators

Software Architecture and Programming

- Architected and programmed software in VeriStand, LabVIEW, and TestStand
- Built control code to simultaneously control actuator pressures, velocity, load, and torque
- Integrated Simulink models into VeriStand for software-in-the-loop testing of control code

Control Hardware

- Specified control hardware from National Instruments using PXIe for primary test stand control and cRIO distributed control for hydraulic power unit that can run standalone for manual tests
- Reviewed and helped design wiring and layout schematics

Hydraulic System Review and Design

- Reviewed and helped design hydraulic power units for decentralization of pumping system
- Reviewed hydraulic system design for outsourced TRAS valve test stands

Acceptance Test Procedure (ATP) Review and Implementation

- Reviewed ATP's for proper test development and implementation

LEAD SYSTEM ARCHITECT, LIGHTNING HYBRIDS (LOVELAND, CO) **7/2010 – 11/2017**

Subject Matter Expert for Hydraulic Hybrid System

- Granted patent **US9028354B2** for hydraulic hybrid

Managed of Team of Four Controls Engineers

- Collaborative environment with cross-functional roles of software and hardware development
- Managed to company objectives, balancing ROI, performance, and customer satisfaction

Software Programming and Architecture

- Architected and programmed software in LabVIEW for hybrid control
- FPGA for chip drivers, IO control, software watchdogs, and safe-state
- Developed WIFI Service Tool HMI, OTA updates, and high-resolution real-time data-logging
- Security focused design using salted and hashed encryption for service tool authentication

PCB Design and Test

- Directed and completed circuit designs including ECU with >500 components
- ECU based on NI SOM with dual-core Arm A9 and Xilinx FPGA (Xilinx Zync SOC)
- Reduced overall controller cost from a $5k prototype to a $750 production model

CAN Communication Development

- Development of both J1979 and J1939 CAN bus interfaces

Telematics Development

- 400 million daily data points uploaded from a fleet of 200 fielded systems
- Secure server for OTA updates using SSH and self-signed packages

Wire Harness Design and Sensor Application

- Designed 25 production wire harnesses containing >300 wires
- Selected and validated pressure, temperature, position, and speed sensors

Vehicle Efficiency and Emissions Testing and Tuning

- Testing on system dyno, chassis dyno, test track, and customer A-B testing
- NOx testing and reduction algorithm which reduced hybrid NOx emissions by up to 50%

Hydraulic Circuit Design
- Concept and review of complex hydraulic manifold designs

Test System Design
- Designed large scale system dyno for end-of-line and R&D testing

Customer Pilot projects in India and Mexico
- Multiple 1-2 week trips to install, troubleshoot, tune and train prototype implementations

TEST ENGINEER, WOODWARD (FORT COLLINS, CO) **6/2006 – 6/2010**

Designed and built automated test stations for natural gas regulators and mixers
Wrote, tested, and implemented LabVIEW and TestStand code for EOL tests
Performed Gauge R&R's, MSA's and capability (Cpk) testing and calculations
Transferred production lines to Tianjin, China: set-up, calibrated, and trained test equipment operation

MECHANICAL ENGINEERING INTERN, WOODWARD (FORT COLLINS, CO) **5/2005 – 5/2006**

Automated end-of-line test stands using data acquisition and control, flow meters, and pressure sensors

STUDENT RESEARCH ASSISTANT, CSU – ENGINES AND ENERGY CONVERSION LABORATORY (AKA POWERHOUSE) (FORT COLLINS, CO) **9/2002 – 5/2005**

Calibrated and tested micro-pilot diesel injection system for large bore natural gas engines

TEST ENGINEERING TECHNICIAN, ADVANCED ENERGY (FORT COLLINS, CO) **10/2000 – 8/2002**

Built and troubleshot test stands for high power DC power supplies

COMPUTER SYSTEM ADMINISTRATOR, B&J PLUMBING (LIBERAL, KS) **6/1998 – 8/2000**

Implemented and maintained computer systems for inventory management of >50,000 products

EDUCATION

MBA, WESTERN GOVERNER'S UNIVERSITY (SALT LAKE CITY, UT - ONLINE) **12/2019 (Expected)**

B.S. MECHANICAL ENGINEERING, COLORADO STATE UNIVERSITY (FORT COLLINS, CO) **2006**

GPA 3.1 while also working 20 hours/week and volunteering at church twice a week
DIFFERENTIAL EQUATIONS: 100% grade for the class
MECHATRONICS: Built self-balancing robot using PIC microcontrollers
CONTROL SYSTEMS: Time and frequency domain analysis
SENIOR DESIGN PROJECT: Urban Search and Rescue Robot, Controls Design Team

A.S. PRE-ENGINEERING, SEWARD COUNTY COMMUNITY COLLEGE (LIBERAL, KS) **2000**

GPA 3.6 while also working 25 hours/week

SKILLS

Engineering: Control Systems, Embedded Systems, Electronic Circuit Design, RS-232, SPI, PID, CAN
Computer: Networking, Security, Eagle PCB, Excel, TortiseSVN, FileZilla, MS Project, Linux, Cygwin
Programming: LabVIEW, VeriStand, TestStand, HTML, JavaScript, MATLAB, C, PHP, AutoHotkey, VBA
Training: Low Voltage Qualification (up to 600V), CPR, LabVIEW (CLD), Forklift, Six Sigma Green Belt
Focus: Innovation, Problem Solving, Creativity, Love of Learning, High Attention to Detail, Accuracy
Character: Hard Worker, Honest, Critical Thinker, Ambitious, Determined, Resourceful, Church Deacon

MORE

For more information on personal engineering projects, see my website at resume.jonandco.com