Jeff A. Engel

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Summary

I have received awards, nationally and locally, for my stewardship and advocacy for the things I love. With that same passion I solve problems and create software solutions on all levels. My experience speaks for itself. I have the technical expertise to architect, design, code and test pretty much any solution. I have the planning and leadership skills to get it done on time.

Specialties: Visual Studio, .Net, Agile, FDA regulations, Design Patterns, Medical Device Software, Embedded Development and Communications Protocols.

Education and Training

B.S. Electrical Engineering (1989) Honors
St. Cloud State University, St. Cloud, MN

Professional Experience

3M Health Care
Lead Architect
May 2017 – Present. 3M campus St Paul, MN

Became a full-time employee of 3M working in the Medical Solutions Division. Since becoming a fulltime employee, I have been the lead on two projects – a wireless ECG platform and a Biological Indicator Auto-reader.

The Wireless ECG platform consists of 3 separate hardware devices. One is called the Transmitter and connects to the electrodes on the patient. the other is the Receiver which wirelessly receives ECG signals over WIFI from the Transmitter. The Receiver has a small display for feedback and control. The third device is called the Dock. The Dock holds the Receiver after a connection is made and connects to an ECG monitor. To control the 3 devices 4 binaries were built that ran on 4 different processors. All the processors were ARM based. The transmitter has a custom processor from LifeSignals called the Reach 1D which has two M0 cores. The Receiver has a Reach 1D processor and an STM32 processor from ST-Micro. The Dock has a single STM32 processor. I worked mostly on the Receiver. Most of the development was done offshore through LifeSignals who created the custom Reach 1D processor. Being the project software lead, I had to coordinate releases with LifeSignals and integrate things back at 3M

The second project and my current project is the next generation Auto-reader for Biological Indicators (BI). BI's are inserted in sterilizers for medical equipment to ensure the sterilization process worked. They have spores that should die on a successful sterilization. The Auto-reader incubates the BIs and uses florescence readings to determine if all the spores died. I am developing a Windows application to monitor the Auto-reader over a USB connection with a custom protocol. It collects records from the incubations and sends them up to a cloud-based backend server.

DiaSorin Molecular through **Jeff Engel Consulting, LLC**
Lead Architect and Developer
January 2016 – Present - Various locations

Consulting with DiaSorin on the Integrated Cycler Program. DiaSorin purchased the Integrated Cycler Platform from 3M. The Integrated Cycler was renamed to the Liaison MDX Cycler. I was able to work things out with 3M and DiaSorin to continue development on the platform. I helped DiaSorin do 2 minor releases and 2 major releases of the main Customer application which is called the Liaison MDX Studio. I also developed a service tool for them.

3M Health Care through **Jeff Engel Consulting, LLC**
Lead Architect
January 2016 – April 2017 3M campus St Paul, MN

Consulting with 3M on the Clean Trace project. My main part of the project was to write a windows application to a luminometer over a proprietary USB connection. Developed a protocol to control the luminometer. The luminometer was an Android based device. It is used to detect ATP on swabs after they have sampled a surface. The results of the readings are logged in a backend server.

3M Health Care through **Wynedge Software**
Lead Architect
April 2005 –January 2016 3M campus St Paul, MN

Consulting with 3M providing lead software technical expertise for all software needs for the Integrated Cycler instrument. The Integrated Cycler performs DNA analysis using a technology known as polymerase chain reaction (PCR). I was project lead for 6 major releases of the Integrated Cycler Studio (ICS) application that controls the device.

- Responsible for gathering requirements with end users. Many meetings on site in Los Angeles with the end user to develop award winning software. Implemented all requirements in a .Net application and components mostly written in C#.
- Developed components in C# to control the Integrated Cycler. These components use standard design patters to provide state-based control of the instrument. These components are used in a variety of applications including ICS.
- Created an application used at the manufacturing site to calibrate and configure new instruments.
- Supported the control programs that run on the 5 PIC processors which control the device. These control programs are written in procedural C and build with tools from CCS.
- Implemented Software development processes and documents. Formal specification templates used by the rest of the software team.

3M Health Care through **Wynedge Software**
Principal Software Engineer
January 2009 – March 2013 (4 years 3 months off and on) 3M Campus St. Paul MN

Consulting with 3M providing feasibility work and software support for the Littmann stethoscopes. The 3200 series scopes are Bluetooth connected to a PC or other device. Initial core components I developed helped create a technology known as Scope to Scope where a cardiologist can listen to a patient's heart across the internet.

- Feasibility work to connect a stethoscope to an iOS application over a Bluetooth link. Learned iOS development with MFi and BlueCore development.
- Wrote C# components for communications between a Windows computer and a scope over a Bluetooth link

St. Jude Medical through **Wynedge Software**
Senior Software Engineer
November 2008 – April 2009 (6 months)

Consulting with St Jude to write C++ components to map surfaces. These components where to be used in the EnSite mapping software. The components developed using complex algorithms such as Convex Hull, Alpha Shapes and Marching cubes.

Veeco through **Wynedge Software**
Senior Software Engineer
September 2004 – April 2005 (8 months) White Bear Lake

Consulted with Veeco providing communications protocol expertise to be integrated into an industrial automation controller used in semiconductor wafer manufacturing equipment

• Wrote protocol drivers for Modbus TCP, Modbus RTU, EIAA BiSynch, Eurotherm proprietary, and DeviceNet.

Honeywell through **Wynedge Software**
Senior Software Engineer
March 2000 – September 2004 (4 years 7 months) Edina, MN

Consulted with Honeywell providing lead software technical expertise in the development of a large automated system (Atrium) which provides for the storage and analysis of data from various building controllers, sensors, meters and other field devices used by facility managers to improve ROI associated with maintaining building operations.

- Provided lead software support for three key areas of project: Utility Metering, field configuration of devices and kernel design and implementation of Atrium.

- Worked with a startup company called Dust Inc. to develop a wireless mesh network to be used for integrating electrical current sensors throughout large supermarkets.
- Designed and implemented software to support the capture and logging of utility pulse and Modbus meter inputs using a customized set-top box (STB) from VXL Instruments. Created a Linux based image for the STB.
- Developed tools and processes to improve productivity of Operations when configuring Field Interface Devices for Metering customers, in accordance with product system requirements.
- Responsible for leading development of the product kernel with the objective of modifying l to support asynchronous communications in a horizontal scalability of system.

Boston Scientific
Senior Software Engineer
February 1999 – July 1999 (6 months)

- Developed telemetry software for the 2920 programmer that programs the implantable pacing device within patients.
- Performed unit testing of firmware for a TMS320 series DSP. Developed using structured testing techniques and data flow diagrams.
- Started to develop software requirements for a programmer for a new defibrillator in compliance with Guidant's very strict product development cycle.

Comtrol Corporation
Senior Software Engineer
June 1995 – February 1999 (3 years 9 months) Roseville, MN

- Developed device drivers, firmware, and supporting software for a variety of operating systems for devices that provide connectivity for PC communications – including Comtrol's primary product line, RocketPort which is a family of adapters that provide multiple RS232 ports
- Developed boot code and an Ethernet driver for a processor that uses the ARM CPU and has a 10/100Meg Ethernet controller on it
- Developed a driver for an Analog Devices digital modem. Wrote a driver to control the T1/E1 framer.
- Developed firmware, Windows NT NDIS Miniport driver, and supporting Windows applications for a four port Basic Rate Interface (BRI) ISDN Virtual Server.
- Developed firmware, Windows NT NDIS Miniport driver, and supporting Windows applications for a one port BRI ISDN Internal PC adapter.
- Made major enhancements to the Windows NT kernel mode driver for the RocketPort adapters
- Wrote a driver for a proprietary Operating System from Cisco for the RocketPort. The driver model used is very similar to the driver model in Novell Netware.

- Made enhancements and changes to the SCO Unixware and SCO Open Server drivers for the RocketPort.
- Provided technical support to customers on-site and via phone.

Unisys
Senior Engineer
September 1989 – May 1995 (5 years 9 months) Roseville, MN

- Involved in all aspects of supplying high coverage test lists for all levels of a mainframe componentry.
- Designed and wrote a front end to a program to automatically generate test lists to test RAMs (written in C to run on OS1100 or DOS).
- Designed and wrote a program that sorts logic to test for an AC test that is called the “fast apex” test (written in FORTRAN to run on OS1100)
- Designed and wrote a translator/compiler to convert a language into test lists (written in FORTRAN to run on OS1100)
- Wrote Perl scripts and short C programs for interrogating the myriad of files produced by the ATG
- Worked closely with the test facilities during prototype checkout to ensure quick turnaround during wafer sort and final test
- Received patent for contributions on a BIST (built in self-test) design.
- Focal point for facilitating and generating processes for a simulator used to verify test lists.
- Promoted to Senior Engineer in four and a half years and received many achievement awards.