

# M. ADAM DAVIS

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## EMBEDDED SYSTEMS ENGINEER

Hardware and software architect and engineer developing innovative products

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### PROFILE

As an embedded systems expert with 20+ years' experience I provide creative solutions to challenging problems involving embedded design and system integration from concept to production. My expertise in both hardware and software engineering allows me to design efficient solutions to complex requirements.

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### AREAS OF EXPERTISE

- Microcontrollers (8-32 bit)
  - Programming (C, C++, C# assembly, php, Java, ...)
  - Sensor design
  - Signal processing
  - Circuit design & debugging
  - PCB layout
  - Multithreaded processing
  - Real Time OS
  - Wireless communications (Bluetooth, WiFi, Cellular, Zigbee, ISM RF, GPS)
  - Wired communications (Ethernet, USB, Serial, RS232, RS485, SPI, I2C, CAN, LIN)
  - LCD integration
  - Low power design
  - Internet of Things
  - Kernel drivers
  - Libraries, drivers
  - Mobile and desktop app development
  - Database development
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### EXPERIENCE

#### **Embedded Systems Consultant, Semiaxis, LLC 1991-present**

- Designed and developed:
  - Plugin for Persyst EEG software to integrate client's custom EEG processing algorithm into Persyst
  - Library and driver for USB label/receipt printers for use in airport kiosks
  - Free RTOS PIC32 support
  - OSX kernel video driver for USB to HDMI converter chipset, including compression and support of 1080p30 video streams
- Designed and prototyped or manufactured:
  - A medical thermal illusion device for a University of Michigan Neurosurgeon's pain pathway research
  - A custom digital musical synthesizer for live music performance with hand movement sensing
  - A custom light controller and lighting for a rollerblade floor with light effects
  - iPad audio interface to control video switcher for museum exhibit
  - 36 channel lighting element for costume/prop use
  - Internet of Things RFID door and machine access system
  - Linux based GPS system for in-car navigation, including graphical routines and cellular communications
  - Vehicle data collection system including multiple camera image capture, sensor and sound signal processing, and location data capture to SD card
- Debugged
  - Xamarin based iOS app with server integration, local data storage, and completed development, conducting beta testing within the client company as beta release manager
  - A multi-million dollar robotic washing system for mining vehicles and designed a support application to resolve discovered issues without altering the primary control program

### **Research Engineer, Akervall Technologies, 2017-present**

- Designed and developed:
  - Miniature Bluetooth sensor for a consumer application
  - Passed transmitting device through FCC testing
  - Mentored interns
  - Innovative patentable solution to power consumption challenges
  - Produced 3D CAD files and renderings for cavity design and marketing purposes

### **Lead Engineer, Current Motor Company, 2012-2016**

- Designed and developed:
  - Vehicle and solar station telemetry device and services, including vehicle data logging, gps location logging, and modes of communicating live and logged data via radio, cellular internet, and wifi internet connectivity
  - Internet based database for collection of vehicle and solar station telemetry for fleet data and operations, supporting multiple users each with multiple data sources
  - Simple web frontend for fleet managers to securely access their fleet data.
  - Over the air bootloader to allow remote firmware updates to remote embedded devices.
  - Java based routines for use in Android mobile devices to communicate with and perform firmware updates for vehicle CPUs
- Updated and maintained primary vehicle module firmware

### **Software Engineer, Lear Corporation, 2007-2010**

- Designed and developed:
  - Software subcomponents for vehicle body control module for a big 3 automotive client
  - Test plans to meet functional specification and provide traceability reports from regression testing
  - Automated test cases and coordinated design of test cases at remote sites
  - Hardware in the loop test device and interface to enable hardware regression testing
- Implemented:
  - Continuous integration regression testing
  - Ford FNOS messaging protocol in software
  - Binary configuration files and process for maintaining and updating a multitude of configuration files to support multiple variants in each of multiple vehicle lines
- Integrated CAN hardware into software interface

### **Software Engineer, MicroMax, 2007**

- Performed static, dynamic, and LINT code analysis and implemented software in the loop system testing software for tire pressure management system, and discovered a bug in their manchester decoder

### **Hardware Engineer, Digi International (Formerly Rabbit Semiconductor) 2005-2007**

- Managed project for team of 7 for two complete product cycles acting as lead engineer. Directed schedule, administered resources, correlated with sales and operations, prepared documents for QA, established testing, and originated Bill of Materials
- Designed USB memory card read and passed it through FCC, CE, and UL requirements on first submission

### **IT Manager, Group 10 Entertainment, 2001-2005**

### **Programmer/Analyst, Baladyne Corporation 1998-2001**

**Education:** BSE in Computer Engineering, Cum Laude, University of Michigan 2005