Michael L. Davis - Software Engineer

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Telecommuting U.S. Citizen (S.F. Bay Area)

Helping software help people. Building big ambitious tools to solve big, intimidating problems. Started coding at 14. Professional for 40 years. I have enjoyed working for startups, large corporations, and the U.S. government, typically with scientists and academics. I have a very strong 'Get Things Done' work ethic and have been lucky enough to work for organizations that share the same philosophy. The common thread of my work has been innovative user interfaces that make complex functionality tractable. Research interests: Machine learning, science & engineering tools, human-computer interaction, innovative user interfaces, software architecture, direct manipulation 2D graphics.

EXPERIENCE Sole developer except ServiceNow, Ericsson (UI designer, me, and a DB ORM dev), Boeing, and Cadnetix

- **Senior Staff Software Engineer (Remote)** – **ServiceNow** Santa Clara, CA. 11/21 – present. ARCHITECTURE, TOOLS, DEVELOPMENT, MENTORING. Advocated for simplicity, encapsulation, and separation of concerns bringing industry best-practices in-house while mentoring a conscientious and talented team. Architected and implemented several layers, including the foundational layer, of a complete rewrite of application. On my own initiative wrote custom tools to help the team continue developing while waiting 8 months for delivery of API, tools and tests for automated server-to-server testing using loopback on a single server, dozens of diagrams to clarify designs, etc. **JavaScript**. Vim, Eclipse. Lucid Chart.
- **CTO: Frontend, Full-stack, Architect (Remote)** - **Automatic.ai** Palo Alto, CA. 1/20 – 11/21. A.I. RESEARCH & DEVELOPMENT. ***Making A.I. accessible***. **Built and launched open, social, CAE (computer-aided engineering) application for A.I. (machine learning, deep learning).** Super intuitive MIT Scratch-like component-based drag-and-drop editor, IDE, API, and runtime framework (available on Github) for model building and training with customizable inference widgets. **Node.js**, JavaScript, Express, **Redis**, GitHub, **ReactJS**, **AWS** (Lambda, DynamoDB, Route 53, API Gateway, CloudFront, CloudWatch, IoT/MQTT), **Serverless**, **NextJS**, Docker, Python, TensorFlow, Keras, Scikit-learn, PyTorch.
- **Acting CTO: Frontend, Full-stack, Architect, Manager (Remote)** - **Foundry College**, San Francisco, CA. 6/18 - 12/19 GETTING THINGS DONE. ***Making the electorate smarter.*** **Designed UX, architected, implemented and launched full-featured VC-funded ed-tech product, the "Forge," in 6 months.** Think Google Slides meets Zoom meets live Interactive MOOC. Required to support large numbers of Zoom meeting-like classrooms with large numbers (20k+) of students each using transient microservice server-per-classroom architecture. Many unique and innovative technical solutions to satisfy often-changing requirements of non-technical stakeholders. Represented technology at board meetings. Managed QA team. Guided interns. Prepared codebase for transfer to the next team. **Node.js,** JavaScript, Nginx, **Redis**, **ReactJS**, Terraform, AWS, **Socket.IO**, TokBox.
- **CTO: Frontend, Full-stack, Architect, Manager** - **Cheers.ws** 3/2016 - 6/2018. RADICAL UX INNOVATION. ***Making the web friendlier.*** **Designed, built & launched innovative mixed-reality social network with graphic artist intern**. Microservices for scalability, reliability. Single page app with mirrored server-side SEO rendering. URL shortener. Messenger-like chat. Real-time 'following'. Typeahead suggester. Recommendations. FB-like newsfeed. Tiled 'slippy map' with 10 zoom levels. SPA (single-page application), DigitalOcean, **Node.js**, JavaScript, Python, Nginx, **Redis**, **ReactJS**, Terraform, AWS, Socket.IO, SVG, Canvas, **Memcached**.
- **CTO: Frontend, Full-stack, Architect** - **Lifenik.com** 4/2013-3/2016 HUMANE UX R&D. ***Making the world happier***. **Built webapps incorporating the latest research in psychology**. Google Map overlays improve cross-cultural connection, empathy. Lumosity-like games improve happiness, well-being. Gamified social network improves savoring, gratitude, generosity. Linode, Ubuntu, **Ruby on Rails**, Python, Node.js, Nginx, Unicorn (+ AWS, AngularJS, Bootstrap, Passenger).
- **Consulting Principal Software Engineer: Frontend, Application, Architect (Remote)** - **Sandia National Laboratories**. Albuquerque, NM. 4/2001-7/2007 MISSION CRITICAL PRODUCT. **Designed & built advanced ECAD application to run (classified) simulations on world's fastest computer**. ChilECAD - built full-featured commercial-quality schematic capture analog ECAD desktop application supporting custom models and simulators (e.g. XYCE). With my Mica Graphics Framework, wrote and maintained nearly 500,000 lines of DRY Java. Rigorous testing found less than a dozen bugs. Conversion of SPICE to/from schematics, persistence, themes, file version management and conversions. Declarative XML OO parts (symbols) library with MVC separation of concerns, inheritance and overloading. **Java**.
- **Principal Software Engineer: Architect, Frontend and Application layers (Remote)** - **Ericsson**. Menlo Park, CA. CARRIER-GRADE PRODUCT WITH HUGE IMPACT. **Built large carrier-grade operations support system used by 2nd**

largest Telco to provision things like telephone numbers for tens of millions of customers. Wrote frontend (on top of pre-existing TeleUSE-built screens), application layers including 3 graphics editors, and layered framework architecture with extensive randomly generated in-memory test-database. **C++**. MVC. SDLC. Mentoring. Tech-transfer.

- **Co-founding CTO, Frontend, Full-stack, Architect** - **Software Farm, Inc**. 7/1993 - present. Umbrella "C" corp for (few) successful and (many) unsuccessful startups and midnight projects. **Ultimist.com** 4/2011-4/2013. **Designed and built innovative luxury marketplace**. Quora-like Q&A. Badges. Forums. Classifieds. Analytics and statistics. Personal newsfeeds. Provenance tracker. AWS, Ubuntu, Ruby on Rails 4.2, Python, Node.js, Nginx, Passenger, Resque, GitHub, Capistrano. Ported to Unicorn, Cron and Linode. Live (but mothballed). **Mattters.com** 12/2009-4/2011 **Designed and built successful (1.5M uniques / month) Pinterest-like news aggregator**. Over 1000 real-time news channels displayed with smart magazine-like layouts. Three major versions (ROR at Joyent. 100% Node.js at AWS. Mixed ROR and Node.js at AWS). AWS (EC2, S3, SQS, CloudFront), Ubuntu, Ruby on Rails, Python, Node.js, Nginx, Passenger, Resque, Memcache, GitHub, Capistrano. **Magazines.me** 2/08-12/09 **Designed and built browser-based PageMaker**. Flippable webpages. WYSIWYG drag-and-drop editor with Adobe InDesign feature set, outputs HTML and JavaScript. RoR. Joyent. **Sendies.com** 12/2007-2/2008. Designed and built inverted email app. Crowd-sourced greeting cards. **An infinite, zoomable, editable, drag-and-drop canvas**. RoR. Joyent. **Speshy.com** 7/2007-12/2007 **Designed and built ecommerce webtop**. PageFlakes/NetVibes-like online start page with widgets like clock, weather, RSS feeds, etc.. Infinite undo/redo, custom widgets, interactive cloning and inheritance of widgets, live widget source code editor. JavaScript, J2EE. CentOS.

TOOLS AND LIBRARIES BUILT (HIGHLIGHTS) Some sold, some in field, most helped prototype solutions for clients.

- **MICA GRAPHICS FRAMEWORK**. Mica (successor to my EditorObject), now on GitHub, is a Java OO UI widget toolkit, 2D scene graph library, suite of editor components and UI and network graph layout managers. It distills ideas from many toolkits and research papers (Mica was pre Java Swing).
- **EDITOROBJECT**. a bigger better PGL in C++. I was attending a lot of ACM Siggraph, CHI, OOPSLA, Visual Language conferences. OO, GUI and direct-manipulation was ascendant. I was having to write a new graphics editor, it seemed, for every new contract. 'new Editor()' creates a full function 2D editor.
- **UI FRAMEWORKS**. VisualADE, a declarative UI/data-binding builder. Cadabra and Obsidian: Aristotelian category-like declarative DSLs with behavioral and constraint metadata for e.g. auto test, repair, discovery. LUE (Life Universe Everything) used the data-flow paradigm to graphically build live UIs. C++. Java.
- **PGL (Portable Graphics Library)**, in object-oriented 'C', rendered extremely high-performance large 2D scene graphs and windows on top of SunView, X-Windows and standard PC-graphics cards. C.

MORE EXPERIENCE (HIGHLIGHTS)

- **Frontend, Architect (remote)**: **Innovative Research. (SBIR, U.S. Army, C.U. Boulder)**. Environment for the Analysis of Parallel and Distributed Systems. Network graph managers, direct-manipulation graphics editors, tooltips, context-sensitive help, auto backup /recovery, drag-and-drop, and UI generation from metadata. MPI, Java 1.0.2.
- **Frontend (remote)**: **Sun Microsystems (now Oracle)**. Prototyped two applications (Online DiskSuite: dynamic flowchart from which windows were launched and HATool: constrained, interactive treemap editor with extensive design rule checking). My EditorObject. C++.
- **Frontend, Architect (remote)**: **Innovative Research. (SBIR, U.S. Army)**. Environment for the Simulation of Distributed Systems. Built graphical capacity planning tool for Operations Research professor for U.S. Army (e.g. drag-n-drop network creation and workload assignment). Custom MVC (similar to what is now MPC). C++.
- **Frontend: McDonnell Douglas (now Boeing)**. Wrote a highly constrained logical placement, route and display tool for telecom outside-plant equipment (mimicking the hand-drawn diagrams they had been using). C++.
- **Lead, Frontend: Cadnetix**. Technical lead for the graphics group for 4 years, which was responsible for the UI and 2D graphics for the company's products. My refactoring of the graphics library sped up the rendering and graphics database query language by a factor of 10X to 100X. ECAD. C. 80x86. 68000.

EDUCATION

- My first love, I studied **Applied Math** at the University of Colorado, Boulder; differential equations, difference equations, PDE, vector calculus, linear algebra, EE, physics, and graduate courses: probability, abstract algebra and space flight dynamics. Left and joined the personal computer revolution. Previous member of **ACM**, **IEEE**, attended many tech conferences and read literally dozens of trade magazines and journals for 20 years.