Michael L. Davis - CTO, Senior Staff Software Engineer, Code monkey

This CV: says.me michael@says.me github.com/justacoder Palo Alto (SF Bay Area), CA or Telecommuting U.S. Citizen

Helping software help people. Building big ambitious tools to solve big, intimidating problems. Started coding at 14. Consulting for 30 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 these applications 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 Designed, architected, implemented, deployed these in their entirety except co-designed Lifenik, Forge

- **Founding CTO, Automatic.ai** Palo Alto, CA. 1/20 - present. **A.I. RESEARCH & DEVELOPMENT.** *Making A.I. accessible.* **Built, launched open, social, component-based drag-and-drop IDE for A.I.** CAE (computer-aided engineering) for A.I. (machine learning, deep learning). Goal is 10X improvement in accessibility, productivity and the ability of experts to solve hard problems. Super intuitive MIT Scratch-like drag-and-drop editor, IDE, API, and runtime framework. Offshoots **OMG.ai** - The best books (Google + Quora + Medium + Games) and **Rockstar.ai** - open-source software comparisons & analytics. **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.

- **Consulting CTO (Remote), Foundry College**, San Francisco, CA. 6/18 - 12/19 **GETTING THINGS DONE.** *Making the electorate smarter.* **Built and launched full-featured VC-funded ed-tech product in 6 months.** Designed UX, architected, and implemented "the Forge", a tightly integrated semantically-aware edtech online application in 6-months from ideas of world-class active-learning expert CEO to launch with live students. Fully-featured cloud-native LMS + live classrooms + builder application allows code-free construction of, and live presentation of, lesson plans (with lectures and rich media) and algorithmically controlled breakout groups and group activities (for active learning). Think Google Slides meets Zoom meets live Interactive MOOC. Required to support large numbers of 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 next team. **Node.js**, **JavaScript**, Nginx, **Redis**, **ReactJS**, Terraform, **AWS**, **Socket.IO**, TokBox, **(Front end, Full stack, Architect)**.

- **Founding CTO, 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**. People 'see', play and hitchhike with other people on any (framable) webpage in real-time. Uses microservices for scalability, reliability. Single-page app with mirrored server-side SEO rendering. URL shortener. Messenger-like chat. Real-time 'following'. Typeahead suggester. Recommendation system. Facebook-like newsfeed. Tiled 'slippy map' with 10 zoom levels. DigitalOcean, Scikit-learn, **Node.js**, **JavaScript**, **Python**, Nginx, **Redis**, GitHub, **ReactJS**, Terraform, **AWS**, **Socket.IO**, **Memcached**.

- **Co-Founding CTO, Lifenik.com** 4/2013-3/2016 **HUMANE UX R&D.** *Making the world happier.* **Built several mental health webapps with PhD psychologist (daughter)**. 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 (earlier: **AWS**, AngularJS, Bootstrap, Passenger).

- **Consulting Principal Software Engineer (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, I wrote and maintained nearly 500,000 lines of DRY Java. After project termination rigorous testing found less than a dozen bugs. XML-driven plugin architecture for: SPICE-dialect generation and parsing, conversion of SPICE to/from schematics, persistence, themes, file version management and conversions, and simulator setup and job submission. Uses XML to define OO parts (symbols) library definitions with MVC separation of concerns, inheritance and overloading. Java.

- **Consulting Principal Software Engineer (Remote), Ericsson**. Menlo Park, CA. **CARRIER-GRADE PRODUCT WITH HUGE IMPACT**. **Built large carrier-grade operations support system used by world's 2nd largest Telco to provision things like telephone numbers for tens of millions of customers.** Architected and wrote frontend (on top of TeleUSE) and application layers in C++ including 3 graphics editors. Utilized multi-layered framework architecture and extensive randomly-generated in-memory test-database.

- **Co-founding CTO, 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 **RAPID PROTOTYPING. B2C. RESEARCH & DEVELOPMENT. Designed and built innovative luxury marketplace.** "The safer smarter friendlier luxury marketplace". Several major pivots based on feedback from domain experts. Quora-like Q&A. Badges. Forums. Classifieds. Analytics and statistics. Personal newsfeeds. Editable product database with searchable sortable semantic properties and tie-in to latest news. 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.** "Follow Your Interests" 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.** "Many to one messaging" 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, on-screen interactive cloning and inheritance of new widgets, in-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, and UI and direct-manipulation were 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)

- **Consulting: 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, right-button menus, and UI generation from metadata. MPI, Java 1.0.2.
- **Consulting: Sun Microsystems (now Oracle).** Prototyped two applications (Online DiskSuite, HATool). One prototype contained a dynamic flowchart from which windows were launched. The other prototype included a constrained, interactive treemap editor with extensive design rule checking. These made use of my EditorObject. C++.
- **Consulting: 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 to provision computer networks (e.g. drag-n-drop network creation and workload assignment). Custom MVC (similar to what is now MPC). C++.
- **Consulting: McDonnell Douglas**. 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++.
- **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 mags and journals for 20 years.