J. Donald Tillman

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Resume

A substantial career in software engineering from microcode to AI to web technologies. User interface, product design, scientific and data visualization, control system theory, with connections to math, physics, and business.

Plus electrical engineering, digital electronics, digital signal processing, analog circuit design, audio circuitry, electronic music and synthesis.

With a diverse background I bring multiple technologies together to solve complex problems. Passionate about product design; shipped a career total of about 60 products.

Computing Languages: JavaScript, TypeScript, Python, Scala, Java, Lisp, Numpy, C++, etc.
UI Specializations: React, Redux, Django, HTML5, XHTML, CSS, Node.js, Web Audio, etc.

LifeScore Music
Wiltshire, UK (remote)
Principal Engineer and Startup VP, 2020 to 2022

LifeScore is a small startup out of Abbey Road Studios applying AI technologies to create adaptive soundtrack music for videos, wellness, games, streaming, and embedded applications. And cars, with partnerships with Bentley Motors and Audi for the first automotive application composing music based on driving and road conditions.

Developed and implemented algorithms to analyze real-time CAN Bus telemetry data, to direct the structure of the composition, to create the composition on the fly, and to sequence and mix combinations of audio samples. Extended the concept to environment tracks with a set of algorithms to generate continuous environment sounds from a tiny set of samples.

Designed and implemented the in-house CAD System for building adaptive music. Composers can import and validate audio files, construct relationships between them, set parameters, perform simulations, analyze the results, and generate metadata for the compose engine. And built a high-performance compose engine.

Introduced technologies and development processes to the company, wrote detailed specifications, managed projects, managed outsourced software development, and designed the workflow that can scale to millions of users. JavaScript, React, Jupyter Notebook, Python, Numpy.

Nauto, Inc.
Palo Alto, California
Senior Software Engineer, 2019-2020

Nauto is a startup that makes a device for fleet drivers; it has a camera that watches the road ahead, and a camera that watches the driver, and alerts if the driver is being distracted. A combination of software, cloud, machine vision, machine learning, hardware, and analysis.

Developed *Fleet Management* and *Device Configuration* apps, powerful tools that support customers and device delivery. JavaScript, Node.js, React/Redux development, design reviews, code reviews, user interface design.

Instrumental, Inc.
Los Altos, California
Senior Software Engineer, 2018

Startup applying machine vision and cloud-based machine learning to improve manufacturing processes and raise yield by analyzing anomalies and defects. Backend development in Scala, database support, a utility to bundle AWS requests, unit tests, automated summary reporting and interface with SendGrid, machine vision training, proposed a front-end tool with a visualization of the detailed status of the production line.

Consolidated Fuzz
Palo Alto, California
Founder, 2014 to 2017

Bootstrapping a startup company. Applying modern user experience concepts to hardware and creating an ergonomic modular platform for professional audio electronics. Created a business model with multiple mechanisms of exponential growth, financials for a five-year forecast, pitched to investors.

Developed innovative oscillators, filters, and other analog and digital electronics; SPICE simulations, printed circuit board layout, testing. Developed a Python CAD tool for automated mechanical layout, panel design, and printing. Developed and prototyped an initial (minimum viable) product line. Created catalog web pages featuring interactive demos with engaging HTML5 JavaScript visualizations and audio simulations.

Wrote, filed, and was granted US patent 9,800,357: Modular Platform For Creation and Manipulation of Audio and Musical Signals.

Riverbed Technology (IPO in 2006)
San Francisco and Sunnyvale, California
Technical Staff, User Interface Architect, 2005-2013

Riverbed Steelhead network appliances accelerate the performance of Wide Area Networks by over an order of magnitude. Designed and implemented a powerful full-stack UI framework for multiple product lines. The framework consistently generates widgets from declarations, with input validation, role-based management, retargeting, AJAX-based tables, and mechanisms for presenting complex arrangements of widgets and user interactions.

Implemented the user interfaces for the flagship product lines: the Steelhead WAN optimizer and the Central Management Console. These are substantial web setups, about 80 pages each, and helped grow the company revenue to $800 million. Grew a team of 12 engineers, set coding standards, code reviews, tech talks, mentoring, design meetings with other departments, user studies, college recruiting.

Kazeon Systems (acquired by EMC Corp.)
Mountain View, California
Senior Member of the Technical Staff, 2004-2005

The Kazeon Information Server is an appliance that crawls, analyzes, indexes, and classifies unstructured corporate data for search, compliance, discovery, and data management. The system runs as a cluster for scalability. Designed and implemented the Search and Audit user interface and the Policy Engine with LDAP persistence.

Sigaba / Secure Data in Motion (acquired by Proofpoint)
San Mateo, California
Principal Member of the Technical Staff, 2002-2004

Designed and developed Sigaba Secure Statements (now Proofpoint Email Encryption), a system to deliver important documents such as invoices, financial statements and medical records securely over email with encryption, signing and authentication. Local ActiveX Control or decryption server.

Marimba (IPO in 1999, acquired by BMC Software in 2004)
Mountain View, California
Senior Engineer, 1998-2001

Major contributions to the Marimba Castanet Internet Infrastructure Suite, a system to efficiently distribute a software application over standard internet protocols. Ported Castanet to the Macintosh, to Linux, and to the SCO UnixWare platforms.

Netscape Communications (acquired by AOL)
Mountain View, California
Senior Software Engineer, 1996-1998

Development of Netscape Visual JavaScript, an Integrated Development Environment for building dynamic web pages with HTML, JavaScript, form elements, Java Beans, Java Applets, and database access tools. The components are dropped onto a semi-WYSIWYG page editor and connected up with JavaScript code.

Apple, Advanced Technology Group
Cupertino, California
Consultant, 1993-1996

Software development and system design for SK8, a multimedia object-oriented authoring tool and development environment. Built a Common Lisp interface to Mathematica, and development, benchmarking, and tree-shaking tools.

Lucid, Inc. (Stanford AI Lab startup, acquired by LispWorks.)
Menlo Park, California
Computer Scientist, 1989-1992

Ported the Lucid Common Lisp compiler and development environment to Sun SPARCStation, DEC VAX and DECStations, 386/486 PCs, and Hewlett-Packard Precision Architecture. Taught Lisp courses, presented at the 1989 X-Windows conference.

Consulted for **Intel**'s AI group, designing and implementing an expert system to schedule a semiconductor manufacturing facility, maximizing throughput with roughly 20 products, 200 hundred steps in the manufacturing process, 300 machines, and thousands of lots of wafers. Built the factory model, model editor, strategy and tactics editor, interface with manufacturing floor databases, and optimization algorithms.

Symbolics Lisp Machines (IPO in 1995)
Cambridge, Massachusetts and Chatsworth, California
Senior Member of the Technical Staff, 1983-1988

Symbolics was founded by researchers from the MIT Artificial Intelligence Lab to commercialize and deliver the most advanced Lisp Machines and development environment. A Lisp Machine is a high performance computer that runs the language Lisp as its native instruction set.

Designed the disk controller for the 3640 Lisp Machine. Designed the Front End Processor / IO Board for the 3620 Lisp Machine (processor, disk and tape controller, Ethernet, serial ports, bus interface logic). Software maintenance, support, programmable logic compilers, simulation software, disk performance tools, diagnostics, microcode, CAD utilities.

Texas Instruments
Houston, Texas
Design Engineer, 1981-1983

Electrical design of the video section of the TI931 video terminal. Designed two ICs used in the TI OPTI 940 video terminal and the TI Professional Computer.

University of Wisconsin, Space Science and Engineering Center
Madison, Wisconsin
Technician, 1980

Electronic work on ground support equipment for the Hubble Space Telescope.

University of Wisconsin
Madison, Wisconsin
1980, Graduate study, Electrical and Computer Engineering
1977-1979, B.S., Electrical and Computer Engineering
Specializing in communications, digital signal processing, computer aided design.

Rensselaer Polytechnic Institute
Troy, New York
1975-1976
Electrical Engineering

Patent

US patent 9,800,357: Modular Platform For Creation and Manipulation of Audio and Musical Signals

Web Sites

BayProg, https://bayprog.org
Bay Area Progressive Rock resources. Python, Django, SQLite, AWS.

Exhibits

I was asked to make a tablet version of my JavaScript simulation of Marvin Minsky's Triadex Muse for the *AI - More than Human* museum exhibit. Visitors can view a physical Muse, operate the simulation running on a tablet beside it, presets bring them up to speed quickly, animated graphics display the operations inside, and they can take a copy home with the URL.

On tour at:

The Barbican Centre, London (2019)
The Groninger Forum, The Netherlands (2020)
The World Museum, Liverpool (2021)
Guandong Science Center, China (2022)
Sede Afundación A Coruña, Spain (2022)

Articles

An Improved Sine Shaper Circuit
The Mechanics of Moore's Law
38 Startup Company Ideas
Startup Proposal: Intelligent Traffic Signals
A New Business Model for the Music Industry

Articles with Interactive JavaScript Demos

Exploring Walsh Functions
The Kahn Chaotic Pendulum
The Waveform Workbench
Root Locus Demo of Real Poles with Feedback
Marvin Minsky's Triadex Muse in JavaScript
Don Lancaster's Psych Tone in JavaScript
Guitar Pickup Response Demonstration

Audio and Electronic Music Articles

Harmonic Distortion, Odd- and Even-Order
A Palette of Static Audio Waveforms
Square Wave Variations
Quadrature Trapezoid Voltage Controlled Oscillator
(The Doepfer A-110-6 Oscillator is based on the circuit in this article.)
Voltage Controlled Duty Cycle Sawtooth Circuit
An Interpolating Scanner Circuit
Moog Synthesizer Patent Reviews
ARP Synthesizer Patent Reviews
Mellotron Patent Reviews
Response Effects of Guitar Pickup Position and Width
Response Effects of Guitar Pickup Mixing
(These two referenced by the Journal of the Audio Engineering Society.)
A Discrete FET Guitar Preamp
An FET Preamp Cable
ARP Instruments entry, Grove Dictionary of Musical Instruments, Oxford Univ. Press (2nd ed, 2014)