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BA, Liberal Arts, Sarah Lawrence College
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Objective: Apply knowledge-engineering techniques to advance the web as a dynamic, user-empowering medium.

Domains

agency
full-stack
devops
leadership

4
years

social network

public safety
messaging

Principal Software Engineer, Mindgrub 2017 – Present

Mindgrub Technologies is a Baltimore-based digital agency providing solutions to partners over a wide range of industries.

Besides my regular production work (major projects noted below), as Principal Engineer I have completed several initiatives to advance our packaging and delivery processes, including infrastructure coding and open-source development. I routinely train the team on these topics and present research directions. I run technical interviews, and I serve as a “sidekick” to help onboard new team members.

Thread civic network

I led a team of seven engineers developing a cross-platform app for the Thread non-profit organization, which provides community mentoring and support for at-risk youth in Baltimore.

After shipping v1 of this app, our team had the unusual opportunity of doing a “clean room” redesign. Identifying schema maintenance as a major pain point of v1, I created a JSON:API implementation backed by a schemaless, semantic graph database. Leveraging the strengths of the SPARQL query language, I added a filtering DSL that allows clients to perform path traversals without requiring complex join logic. When targeting Amazon Neptune, the API supports engine-specific optimizations based on analysis of execution pipelines. v2 shipped in early 2021 and is stable in production.

The API also supports a lower-cost setup using Apache Jena, which is used in the Broadcast application described next.

FDNY Emergency Broadcast system

I was the architect and primary developer of an emergency broadcast application for Adashi Systems, a leading provider of technology solutions for public safety agencies. Designed to support rapid two-way messaging with FDNY's 20,000-member staff in the face of a “9/11-like event,” the application uses state-of-the-art serverless orchestration techniques to ensure operation even during extreme service outages. The web portal includes a live dashboard with interactive maps for tracking in-progress campaigns.

Principal tech

AWS CDK
Gitlab CI
Gitlab NPM Registry
Node.js
TypeScript

Amazon Neptune
Amazon S3
Amazon SNS
AWS Aurora
AWS API Gateway
AWS Lambda
AWS OneDeploy
AWS VPC
AWS v3 JS SDK
AWS CloudWatch
JSON API
RDF
RDFS/OWL
SPARQL
Firebase Auth

AWS Step Functions
AWS ImageBuilder
AWS X-Ray
AWS Amplify
Amazon Cognito
Amazon SQS
Amazon SES
Apache Jena
Twilio API
ArcGIS API
ESRI web maps

government,
knowledge
management

NASA Open Data Registries

I led a team of five engineers creating several new tools to help fulfill NASA's Open Data mandate, including a central registry for increasing the discoverability of source code assets within the agency. After a successful pilot featuring faceted search and numerous visualizations, we went on to add full-text search, security analysis reports, and GitHub integration.

We also created applications to track Data Management Plans for grant proposals and Digital Object Identifier (DOI) requests by NASA researchers. For all of these apps, as well as the public site open.nasa.gov, I automated deployment to our AWS staging environments and the production servers at Ames Research Center.

Elasticsearch
Redis
Nginx
Mongo DB
Postgres
CKAN
Python
Docker+Compose
AWS EC2
JSON-LD
JSON API
JSON Schema
GitHub Apps

embedded
electronics

MultiWave onboard control center and oscilloscope

Morningstar Corp. is a leading provider of solar power electronics.

I worked with Morningstar's engineering team over several years to create a knowledge-driven platform for building applications against their hardware products. This included the development of an internationalized, web-based control center for an off-grid inverter-charger with extensive configuration and automation capabilities. The app uses less than 3MB of the onboard flash chip.

Besides being the architect and primary developer, I contributed valuable additions to the product. I designed an interactive scheduling view for the advanced generator controls, created a complete device simulation to support offline testing and demonstration, and added an interactive user manual from the existing tooltip copy. Particularly in mapping the device's [Modbus](#) register layout, the system's metadata-driven design leverages advanced TypeScript features to model a complex domain.

Modbus
React
TypeScript
Heroku
CSP

e-learning
web
mobile
GDPR

8
years

Chief IT Officer, Tenjin Technology

2009 – 2017

From its start, I was responsible for all technical decisions and operations at [Tenjin Technology](#), a Dublin-based company providing interactive study problems for students and performance reports for educators, in partnership with all of the major accountancy bodies in Ireland.

My responsibilities included app architecture, web UI, server and mobile development, build and deployment automation, operational support, database administration, and system documentation. I worked with college IT departments to provide secure, seamless login from student portals and expanded interop with common LMS platforms by implementing standards-compliant [SCORM](#) packages and [LTI](#) authentication.

Tenjin is a stable, multi-platform application that has been in continuous operation for over twelve years. Its user and content base has continued to grow, with resources auto-scaling as needed during peak exam periods. Since 2017, I have supported Tenjin by consulting on necessary matters, including GDPR compliance.

C# 5
ASP.NET 4.7
ASP.NET MVC
SQLAzure v12
Azure App Services
Azure Webjobs
Azure Query Insights
Azure SDK
Azure Git deployment
Azure deployment slots
PowerShell 3
Apache Cordova
OAuth 2
Android SDK
IIS 8
ECMAScript 2015
Stylus CSS
XSLT
XCode
Mercurial
Access ODBC
Excel OLE interop

a little of
everything

4
years

Freelance Consultant

2005 – 2009

As an independent contractor, I completed projects for numerous clients including a video rendering app for LaDezign, back-office integration for Max Industries, diamond pricing and inventory for Rothschild Trading, and a fault-tolerant drug library import for MedTech USA.

SQL Server 2012
SSMS
MySQL
Flex 4
GDI+
YouTube API
Windows Forms

custom
e-commerce

1
year

Web Developer, Out the Box Web Productions

2004 – 2005

At this boutique design shop in downtown New Orleans (disbanded by the flood of 2005), I built our e-commerce CMS using Flash Remoting.

Flash ActionScript
Flash Remoting
Verisign payment

COTS
desktop
financial
military

9
years

Senior Program Analyst, Budget Builder

1994 – 2003

I was the primary developer of Budget Builder, a financial software suite for DoD budget analysts that has been in continuous use throughout the services for twenty-four years.

I worked directly on all aspects of the product. For example, I ported the program from DOS to Windows and refactored it for modular updates, designed and implemented an N-level custom reporting engine, and wrote interfaces to government systems. I produced magazine ads and instructional videos, represented the company at trade shows, and conducted training sessions, including a class at West Point Academy.

FoxPro 2.6a
FoxPro DOS
InstallShield
SQL
dBASE

+ 2
years

In 2011, Budget Builder was acquired, and I was + 2012 – 2013 hired to port it to VFP (for 64-bit compatibility).

The project was completed on schedule and certified for deployment by NMCI. The next year, I ported a sister application for the Naval Reserve.

Visual FoxPro
WiX Toolset
Orca
Subversion

open-source
literate
programming

willshake.net (personal project)

Project willshake is an exploration of the intersection between Shakespeare and computer media. It's an open-source, literate program that produces the self-documenting exhibit willshake.net.

Using a minimal bootstrapper on top of the Tup build tool, it turns a directory of Org documents into a self-updating system in which incremental builds are very fast, even as the project grows. All rendering and navigation is based on a tiny rule-based framework I designed, with isomorphic JavaScript and Python implementations.

Tup
XSLT
Emacs Org Mode
Python WSGI
LaTeX
Graphviz
Apache Web Server
LetsEncrypt