Duncan Mak

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Employment

July 2023 ~ July 2024

Elemental Cognition Inc. Cambridge, MA
Senior Software Engineer working on the Cogent AI Platform

Full-stack engineer: Worked in a 3-person team to rapidly productize the Cogent AI, the marquis product of the company.

Focused on the front-end with frequent rotations to work on the backend as well.

Cogent editor: Instrumental to the ongoing productization of Cogent's web-based programming environment.

Using React/TypeScript/Tailwind CSS, helped redesign and rewrite in 3 months a new IDE for Cogent, achieving much-improved UX and a more-polished look-and-feel.

Key features: Model inspector and many of the UI controls used throughout the app (Button, Popup, Dialog, etc)

Cogent backend: Worked in Scala in the compiler and middleware codebases to support new features, i.e. landed v1 of SQL support by integrating Apache Calcite in my first month and later added introspection support to the LSP server.

Cogent SDKs: Created the TypeScript SDK for Cogent. Responsible for CJS/ESM packaging, feature completeness and documentation.

Shipped the first release of the SDK to the 1st wave of potential customers.

Using Docusaurus and MkDoc, greatly improved the workflow and display of documentation for both the TypeScript and Python SDKs.

July 2020 ~ Feb 2023

Microsoft Inc. Cambridge, MA
Senior Software Engineer for docs.microsoft.com and learn.microsoft.com

Full-stack engineer on the Video team: Took over the maintenance of the Video on Demand service written using C# and fixed bugs in the frontend using Web Components and Typescript.

Led a squad of 4 developers to improve test coverage, deployment reliability, as well as MS-internal compliance metrics.

Worked on dozens of backend microservices (C# and YAML), fixing bugs and helped consolidate common code from 10s of repositories into different shared libraries, removing duplication and increasing compliance.

Reworked the Typescript codebase for internal admin interfaces, *reducing the existing code count by 5x*.

Revamp internal tools: Led an initiative to setup a Buildless Javascript environment using the Deno Runtime, Lit.dev and Modern Web Components to radically simplify how internal tools are authored, tested and deployed. Reduced the developer inner-loop from over 5 minutes down to seconds.

Shipped the first version of Org Reporting in the first 3 months of joining the organization.

Served as onboarding buddy to multiple new junior developers and mentored them into becoming maintainers of codebases and services owned by the team.

July 2019 ~ July 2020

Senior Software Engineer in VS Engineering

Modernize VS Build: Spearheaded the process to integrate MSBuild 16 for building components within Visual Studio, aligning VS with company-wide 1ES practices regarding .NET Core. Successfully on-boarded the XAML Designer team, allowing them to ship cross-target projects in VS for the first time. This was very well-received because it had been stalled for over a year before I started working on it.

Mac Notarization: Coordinated a cross-company effort to support Notarization on macOS Catalina. Worked in conjunction with Edge, ESRP, Java, .NET, Office and VSCode to ensure Microsoft can ship Mac products for the new macOS release. Visual Studio for Mac shipped on Catalina with first day support when Notarization began to be enforced.

July 2016 ~ July 2019

Senior Software Engineering Manager

Team Lead and Engineering Manager: Grew the team from 4 to 7 members, continued to be responsible for all engineering infrastructure used by Xamarin Platform engineering, which includes the Mono runtime and the Visual Studio for Mac IDE.

Collaboration across divisions: Represented DevDiv and collaborated with Office Mac engineering to prepare for migrating Mac build labs from on-premise to hosted inside data centers.

Monitor VSMac build times: Built tooling to monitor the CI performance of Visual Studio for Mac. Using data generated by the tool, identified trends and specific commits that led to increased build times. This work was presented to senior leadership.

Custom Tools for smooth work-flows: Designed and implemented a ChatOps system using Azure Functions to work with GitHub and Slack APIs using F#, improved the code for the Update server for Visual Studio for Mac in C# and built many tools to create a friction-free engineering system for the engineers working on the Xamarin Platform.

Nov 2011 ~ July 2016

Xamarin Inc. (acquired by Microsoft) Boston, MA
Engineering Lead for Release Engineering

First Release Engineer: One of the earliest members to join Xamarin. The first full-time employee responsible for release engineering of the Xamarin Platform.

Build lab: Grew the on-premise Mac build lab from 5 machines to nearly 100 machines, serving a fully-remote, global engineering team that grew from 10 members to over 100.

Hiring: Hired and grew the release engineering team from 1 to 4 full time members.

Faster builds on multiple architectures: Using data from our CI server, analyzed build logs and improved the build times for Mono by reducing unnecessary targets in the Mono makefiles.

Jenkins CI: Began migrating from our in-house CI system onto Jenkins CI.

Infrastucture as Code: Investigated and experimented with Jobs DSL with the aim towards an IaC solution.

Dashboards for optimized infrastructure: Built a dashboard to visualize of our CI usage and turn off unnecessary jobs, a dashboard to track and display the status of each Mac build nodes in the growing lab. Chose to use Typescript and React, which were both new technologies at the time.

May 2011 ~ October 2011

MyEnergy Inc. (acquired by Nest Labs) Boston, MA
Software Engineer

Wrote tools to extract textual information from PDFs using JRuby and Scala 2.8.

September 2008 ~ April 2011

Center for Brain Science, Harvard University Cambridge, MA
Software Engineer for the Connectome project

As the only software engineer in the lab, I created and maintained the software stack used by Harvard researchers. I learned to assess, design, and implement software solutions that meet the ever-shifting needs of cutting-edge science research.

Wrote the Piet image system used daily by neuroscience researchers. A cross-platform Java Swing application with a polished UI.

Developed multiple automated image alignment systems, including co-designing and implementing an image alignment algorithm in Clojure.

Skills

Functional Programming using Clojure, F#, Scala and Scheme.

Object-Oriented Programming using Ruby, Typescript, C#, Java, and Squeak Smalltalk.

Fluent in English and Chinese (Cantonese and Mandarin).

Able to speak, read and write French, Spanish and Japanese.

Education

January, 2009

Northeastern University Boston, MA
B.A. in Computer Science

January, 2007

Northeastern University Boston, MA
B.A. in Linguistics