

MATTHIEU GAY-BELLILE

SOFTWARE ENGINEER

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🌐 mgb.sh

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Skills

PROGRAMMING LANGUAGES

C#

C

C++

JavaScript (ES9, TypeScript, JSX)

Python

Java

Objective-C

Verilog

HTML / CSS / SCSS

GLSL

FRAMEWORKS, PLATFORMS, AND TOOLS

.NET Core / ASP.NET Core

Docker / Kubernetes

gRPC

Consul / Vault

Terraform

Entity Framework Core

GraphQL

Node.js / Express

React

Git

Alexa Skills Kit

Spark / Databricks

AWS

SQS / SNS

S3

API Gateway

Lambda

Elastic Beanstalk

VPC

RDS / Aurora

Batch

CloudFormation

DATABASES

PostgreSQL

DynamoDB

MongoDB

Elasticsearch

MSSQL

Redis

Education

Georgia Institute of Technology

B.S. Computer Science 2019

Degree concentrations: Systems & Architecture / Artificial Intelligence

GPA: 3.57, Major GPA: 3.78

Aug. 2015 to May 2019

Employment

Kabbage

Software Engineer

Atlanta, GA

May 2019 to Current

- Developed and helped design .NET Core 3.0 gRPC streaming microservices running in Kubernetes to gather, persist, and provide runtime access to raw customer data for loan underwriting purposes
- Worked on a unified GraphQL gateway for querying customer data across multiple databases
- Maintained and debugged a large, complex, and business-critical legacy .NET system

Vlipsy

Software Engineer

Atlanta, GA

May 2018 to Apr. 2019

- Developed integrations for Facebook Messenger, Slack, Gmail, and Viber
- Designed and developed new API for use by all clients, built on Amazon API Gateway and AWS Lambda
- Leveraged EC2 resources in a hybrid serverless architecture to optimize price/performance of compute-heavy tasks

Georgia Institute of Technology

Wreck Techs – Residential Technology Advisor

Atlanta, GA

Aug. 2017 to Apr. 2019

- Performed maintenance work on the Georgia Tech network including replacing cabling and network jacks, and surveying the wireless network
- Assisted Georgia Tech students with network access, malware removal, software installation, and operating system repair

Duke Energy

Cybersecurity "Red Team" – Penetration Testing Intern

Charlotte, NC

May 2017 to Aug. 2017

- Discovered and reported a critical flaw in corporate physical access control systems
- Designed and developed an internal web application to request penetration tests from the Red Team, built on Redis Pub/Sub for a pluggable, extendable, event-driven architecture

Duke Energy

IDEA Lab – Software Development Intern

Charlotte, NC

May 2016 to Aug. 2016

- Designed and developed a web application for internal "Innovation Challenge" initiative, built on a MEAN (MongoDB, Express, Angular (2.0), Node.js) stack with Bootstrap 4 UI and a REST API backend
- Developed a framework to integrate energy usage reporting services with the Amazon Echo smart speaker, using Lambda and Alexa Skills Kit

Projects

xARMv6 Operating System

Operating systems course final project

Jan. 2018 to May 2018

- Ported MIT's UNIX-like xv6 teaching operating system (which runs on intel x86) to the ARM-based Raspberry Pi 2
- Fully functional and interactive, with virtual memory management, preemptive multitasking, and an in-memory filesystem
- MMU interface, timer control, UART I/O, low-level interrupt handlers, context switching all rewritten from the ground up
- ~12,000 lines of C, ~300 lines of ARM assembly

Tiger Compiler

Compilers course semester project

Aug. 2017 to Dec. 2017

- A compiler for the Tiger programming language (specification: <https://mgb.sh/tiger.pdf>), with a MIPS backend
- Includes lexer, parser, semantic analysis, IR generation, instruction selection, register allocation, MIPS code generation
- Written from scratch with no 3rd party components (e.g. Flex, Bison, LLVM) in compliance with project requirements
- ~3,000 lines of C++14, not counting generated lexer code

Pawgistics Web App

Degree capstone web app project

Aug. 2017 to May 2018

- Built for Canine Assistants, a non-profit organization that trains service dogs for people with physical disabilities, seizure conditions or other special needs
- Tracks volunteers, staff instructors, and dogs to facilitate coordination and maintain chain of custody of dogs, as well as better record-keeping
- Modern, API-backed, client-side single-page web app built with Node.js, Express, and React + Redux
- Build pipeline with full hot-reloading support for minimal development friction, or performance-tuned production build with bundling, minification, and compression

FluidSim iOS App

iOS fluid simulation personal project

Jan. 2014 to Aug. 2015

- Found a smoothed-particle hydrodynamics fluid simulation algorithm written in C#, ported it to C++, and tuned it for smooth 60fps operation despite mobile performance constraints
- Added variable gravity based on device accelerometer, and touch interactions with the fluid
- Wrote post-processing routines in OpenGL ES to draw discrete simulation particles as a smooth, continuous fluid
- Enabled customization of fluid appearance, color, and physics through in-app menus and flexible shaders
- Designed custom UI using iOS Storyboards and Objective-C