

Alexandre JOUANDIN

PERSONAL INFO

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WORK EXPERIENCE

SUMMER 2017 | Software Engineering intern at [Blòkur](#) London, UK
Worked on building the foundation of the Blòkur start-up. Working in Golang, I redesigned and reimplemented a single-thread file processing algorithm into a highly concurrent, fault-tolerant system that could run across multiple processors across multiple AWS servers. I rewrote the proprietary music-work matching algorithm to optimize the code, optimize the PostgreSQL requests, and added multi-processing, which together cut the processing time by a factor of ten. Beyond that, I enjoyed gaining experience working within a burgeoning start-up on a tight schedule with its angel investors. | [Recommendation on LinkedIn](#)

SUMMER 2016 | Software Engineering intern at [RiteTag](#) Remote
Took part in RiteTag's mobile team to build the iOS app that goes along the web app. I was given the chance to build and lead a team of other interns to take on designing and implementing in Swift the foundation for the new direction the company was about to take. Our role was to split the already existing app into two parts: the actual app and a private framework that a new upcoming suite of apps would use. The team most definitely appreciated the solution I came up with, and my work still lives on in the published apps of the company. | [Recommendation on LinkedIn](#)

EDUCATION

CURRENT JAN. 2018 | [Georgia Tech](#) Master's Sc. in COMPUTER SCIENCE (European Campus) Metz, France
Major: *Machine Learning*
Developing my Computer Vision and Autonomous Robotics skills (Perception, SLAM, Task Scheduling) while heavily specializing in Machine Learning and Artificial Intelligence. Through this specialization I experienced a lot with many Machine Learning technologies and gained a lot of insight on tuning supervised, unsupervised and reinforcement learning algorithms.

2015-2017 | [ENSEEIH](#) Master's Sc. in COMPUTER SCIENCE Toulouse, France
Major: *High Performance Computing & Big Data*
Deepened my knowledge of programming. Specialized in High Performance Computing (Large Scale Linear Optimization, Computer Architecture) and Big Data (Machine Learning, Bayesian Statistics, Stochastic Optimization) with a strong emphasis on Applied Mathematics.

PROJECTS HIGHLIGHTS

SPRING 2018
COMPUTER VISION

Shrimp in Petri dishes

Python, C++ OpenCV, Kalman Filters

In collaboration with faculty at Université de Lorraine, this project focuses on the visual tracking of freshwater shrimp (*Gammarus*) in Petri dishes and use indicators about their movement to quantify the water quality (roughly, the more polluted the water, the less the shrimps will move).

The goal of the project is the implementation of individual shrimp tracking using image processing with minimal user involvement. Through this tracking, it will be able to compute the movement of the shrimp from a video or a camera feed. Environmental research scientists at Université de Lorraine will then use the software to quantify the water more efficiently, as until now the tracking was done by hand using specialized software.

The implementation uses OpenCV for image processing, edge detection and contour detection. The tracking is performed using the Hungarian matching algorithm and a Kalman filter. Through this customized tracking algorithm, the software is able to keep track of each individual shrimp even in complex situations like blurry motion, and crossings with other shrimp.

FALL 2017
INTERNET SERVICES

High performance download server (personal project)

Golang, Swift iOS/macOS/tvOS, HTTP/2, Video Encoding

This project stemmed from the need of downloading files securely from iOS, an Apple TV or a Mac. A server written (from scratch) in Golang takes care of downloading all sorts of files, and through an app on the device, a user can add, pause, and remove downloads. A file still downloading on the server can then be downloaded on or live streamed to the phone. For video files, the server even supports live re-encoding of the files in an iOS-compatible format that follows Apple's efficient HTTP Live Streaming (HLS) protocol.

The code makes extensive use of Golang's concurrency features, which was chosen for this purpose. Communication between the server and the applications use gRPC, Google's modern take on the RPC protocol that supports HTTP/2 out of the box. The code also re-implements a good deal of Apple's HLS server tools like the segmenters, the variant playlist creator. Along with the conversion, those are handled through calls to the FFmpeg open-source framework.

SPRING 2017
IoT

Garage door opener for iOS

Golang, Swift Bluetooth-LE, Embed systems, Raspberry-Pi, GPIO

This project was done in freelance for a French start-up that takes an attempt at popularizing private parking space sharing. The goal was to build an iOS app that connects via Bluetooth-LE to a Raspberry-Pi with a [sub-1 GHz transceiver dongle](#). Through the Raspberry Pi acting as a Bluetooth-LE interface to the dongle, the iOS App could listen, record, and transmit garage door opener signals.

The Raspberry-Pi software implementation was done in Golang, as it allows cross-compilation of a single binary containing all required libraries, and allowed the code to be both portable and optimized. The communication between the iOS device and the Raspberry-Pi was handled using GATT from the Bluetooth-LE protocol. The dongle was later replaced by lower-level transceivers that were operated through the Raspberry-Pi's GPIO ports.