RESUME COMPLEMENT

I am Thomas Bach, a French engineering student (last year before graduation) in computer science. I am looking for a 6 months internship abroad starting on March 20th 2023 (or early April) in software development, DevOps or AI/ML, to improve and develop my skills. It is also required to complete my degree.

This document provides a complement to my resume and my website. It contains additional information on selected projects that I completed as part of my University program and my internship last year, my education, as well as, the International Experience Canada process that I plan to use to obtain the necessary Visa/work permit to be able to work in Canada.

To review my projects portfolio, please visit my website thomasbach.fr

SELECTED PROJECTS

MEDICAL WEB APP

Type: University project
Duration: September 2022 → January 2023 (5 months)

Full stack web app for doctors and nurses to help detect malnutrition in nursing homes. Developed in a team of 6 and using agile practices. My roles: front-end, DevOps and scrum master. Technologies: **JHipster, Angular, Docker, GitHub actions, Azure**.

My contribution

- **Designed software architecture** with graphs and UML diagrams (data-flow diagrams, sequence diagrams, class diagrams) to facilitate and organize development
- **Designed web mock-ups** using the tool Whimsical
- **Met** with doctors and teachers to gather feedback and present features
- **Developed front-end features** with Angular (HTML, Typescript, CSS) with visual components (using Angular Material, ngx-charts) such as action menus for doctors (reminders, profile, denutrition alerts), and graphs to visualize patients data
- **Designed the database's structure** with JDL studio (a JHipster tool)
- **Created CI/CD pipelines** with GitHub Actions and Docker, to launch tests, lint the code and deploy the application on an Azure virtual machine
- **Configured an Azure virtual machine**, and set up SSL certificate using NGINX

- **Organized daily team meetings** and managed the team's Trello to assign tasks and keep track of what we did
- **Used Git and GitHub tools** (issues, pull requests) to manage the project's code, creating branches for features and resolving merge conflicts when needed

SOFTWARE DEVELOPMENT INTERNSHIP

Type: Internship project
Company: GERAL
Duration: May → July 2022 (3 months)

Developed with **Angular, ElectronJS and MySQL**, the software that I worked on provides a comprehensive user interface to manage tests of electronic cards that are manufactured by the company. With this software, the user can launch test scripts on a card with a hardware bench, consult previous tests history with all the stored data, and visualize graphs and statistics in order to detect potential problems and improve the engineering process.

My contribution

- **Analysis of existing work**, understanding the global project's structure, technical environment and frameworks (ElectronJS, Angular, Nodejs, MySQL)
- **Developed new front-end features** with Angular (HTML, Typescript, CSS) with visual components (using Angular Material, ngx-charts) such as test monitoring page, history page with interactive rows and advanced features (search, filters) and complete data visualization, analysis page to display test statistics
- **Developed back-end features** and asynchronous database queries to fetch data and communicate with front-end components (Nodejs, ElectronJS, MySQL)
- **Modified and maintained the MySQL database**, adding or editing tables and fields to match the needs of new features (using MySQL Workbench)
- **Used Python scripts** to update some values and modify the structure of the database.
- **Met** with managers and users to present and discuss new features, and gather feedback from the users
- **Used Git and GitHub tools** (issues, pull requests) to manage the project's code, creating branches for features and resolving merge conflicts when needed

DAAM: VIDEO GAME IN JAVA

Type: University project
Duration: June 2021

Video game developed in **Java**, at the end of my 3rd year. The game was developed in 3 weeks by a group of 6 students, under specific constraints such as the use of automata for the behavior of entities and **MVC** structure (Model View Controller).

My contribution

- **Designed documents** to present the project's structure, explain the main features and prove the integration of constraints in the game
- **Understood and created** a simple game engine with teachers, with a tick system to manage sprites movements and entities
- **Developed and tested** features for the game, such as minimap, camera controller, HUD, and menus
- **Developed automata system**, including a parser for automata files, an entity builder that convert the parsing results into Java objects representing entities behavior, and an executor that runs these automata in the game
- **Used Git and GitHub tools** (issues, pull requests) to manage the project's code, creating branches for features and resolving merge conflicts when needed

PROJECT ROBIN

Type: University project
Duration: February → April 2022 (3 months)

Applying AI techniques to sound recognition on an embedded device. This was my 4th year end project completed by a team of 3. Using **EdgeImpulse** and the **Wio Terminal**, we were able to recognize some animal noises and print out the model's prediction with probabilities. I really enjoyed this project that allowed me to explore embedded programming and AI model development and training.

My contribution

- **Fetched and labeled** animal sounds samples (on EdgeImpulse) to train the AI and test datasets
- **Created and trained an AI model** to recognize selected animal sounds (EdgeImpulse)

- **Configured and tested the Wio Terminal** to explore sensors and screen display
- **Developed** a program for an embedded device to use the trained model with microphones, an interface to display the model's predictions and visualize frequency levels captured by microphones (C++, Arduino)
- **Used Git and GitHub tools** (issues, pull requests) to manage the project's code, creating branches for features and resolving merge conflicts when needed

EDUCATION AND TRAINING

Higher Education

Polytech Grenoble, is an **engineering school** delivering Master's degrees equivalent in various specialities including Computer Science (Informatique "INFO" stream). It is based in Grenoble (in the French Alps) and is a member of the Grenoble Institute of Technology (INP).

I am currently in the final year of the 5 year program that includes a 2 years CEGEP equivalent preparatory cycle, majoring in **Computer Science** with a minor in Multimedia ("INFO" major with "Multimedia" option). Full details of the curriculum content are available here (see more specifically: Informatique "INFO" section, with details of the courses for the various academic years "Année 3, 4 and 5" available in both French and English). The program also includes a minimum of 32 weeks of internships (2 months minimum in 4th year) and (5 months minimum in 5th academic years). An internship abroad is encouraged.

The Computer Science courses provide **general knowledge** in many areas of computer science. It includes courses on **Object Oriented Programming, AI/ML, Parallel Computing, Human-Machine Interfaces, Databases, Data Science, Web** and **Computer Networks**.

Thanks to these courses, I have acquired skills allowing me to contribute to a **large number of projects** and to **quickly learn** new technologies and frameworks.

I have been exposed to several programming languages, frameworks and tools from the courses: **Java, C, Python, Git, Linux, Angular, HTML, CSS, JS/TS, SQL, ARM, PHP, OCaml, Coq, C++, Docker, GitHub actions, Azure**.

I have also learn and used other technologies during my 4th year internship and through my personal projects: **MySQL, ElectronJS, Unity, C#**.

I have also acquired a solid foundation in mathematics during my education, including **Linear Algebra, Analysis, and Statistics.**

Timeline post high school graduation

2018 → 2023 : Polytech Grenoble

- 2018 → 2020 : Preparatory cycle | 2 years mainly in DLST university (Maths/Computer science) with additional courses at Polytech. This is similar to a CEGEP program in Quebec.
- 2020 → 2023 : Engineering program | 3 years at Polytech in the computer science engineering specialty (“INFO” major with “Multimedia” option chosen in 4th year)

VISA/ADMINISTRATIVE PROCESS

I am planning to obtain the work permit necessary to work in Canada through the International Experience Canada - International Co-op (Internship) program from Immigration, Refugees and Citizenship Canada.

- It is an employer specific work permit
- It requires a job offer for a work placement or internship in Canada
- Anticipated processing time: 4 to 8 weeks after internship agreement signature.