

# Louis Hildebrand

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## Education

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**McGill University** Msc Electrical Engineering

*Winter 2024–Winter 2026*

- **GPA:** 4.0/4.0
- Supervised by Prof. Christophe Dubach (Compilers and Synthesis Lab)
- **Thesis:** “A Minimal Intermediate Language for Generating Streaming Accelerators”

**McGill University** B. Software Engineering

*Fall 2020–Fall 2023*

- **GPA:** 4.0/4.0
- Dean’s Honour List: 2020/2021, 2021/2022, 2022/2023
- British Association Medal (highest final exam grades)

**John Abbott College** Honours Science

*Fall 2018–Winter 2020*

- Valedictorian
- Dean’s List: Fall 2018, Winter 2019, and Fall 2019

## Skills

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- **Formal languages:** C, Assembly (ARMv7, MIPS), Rust, Python, Scala, Java, C#, SQL (MS SQL Server, PostgreSQL), VHDL, OCaml, JavaScript, HTML, CSS
- **Natural languages:** English, French, Afrikaans
- **Frameworks:** Spring Boot, .NET (Framework, Core), Django, Vue.js
- **Other tools:** Git, Bash, Valgrind, Gradle, JUnit, L<sup>A</sup>T<sub>E</sub>X, etc.

## McGill Teaching Assistant Experience

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**Computer Organization** (ECSE 324)

*Fall 2025*

- Delivered tutorials on computer organization (e.g., interacting with devices via memory-mapped I/O)
- Guided students in lab work (writing C and ARM assembly programs)
- Answered students’ questions on the online discussion board
- Graded assignments

**Model-Based Programming** (ECSE 223)

*Winter 2025*

- Delivered weekly tutorials on model-based programming (e.g., UML class and state diagrams, Umple) and other tools (e.g., Git, JUnit, Gradle, Cucumber)
- Answered students’ questions on the online discussion board
- Helped prepare assignments

### **Intro. to Software Engineering (ECSE 321)**

*Fall 2022–Winter 2025*

- Delivered weekly tutorials on developing a fullstack web app with PostgreSQL, Spring Boot, and Vue.js
- Held weekly office hours and answered questions on the online discussion board
- Helped write and grade tests

### **Ordinary Differential Equations for Engineers (MATH 263)**

*Fall 2021*

- Delivered weekly tutorials on differential equations, including a summary of lecture content and practice problems
- Answered students' questions by email

## **Industry Experience**

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### **MDA Space Engineering Intern, DevOps**

*Summer 2023*

- Implemented new features and fixed bugs in web services using ASP.NET MVC, Razor Pages, Telerik, and Kendo UI
- Optimized SQL queries and stored procedures

### **123Loadboard Backend Intern**

*Summers 2021, 2022*

- Independently implemented new microservices given a predefined specification
- Fixed bugs in and added new endpoints to the main API

### **Pierrefonds Day Camps Counselor**

*Summers 2017–2019*

- Supervised groups of children aged 5–12
- Worked in both French and English

## **Projects**

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### **Sirop** (Scala app; master's thesis project)

- Programming language and optimizing compiler
- Generates VHDL description of hardware accelerator from high-level source code

### **Twisty Timer** (Java Android app)

- Contributed new features to an existing Rubik's Cube app (e.g., a practice mode for blindfolded solving)

### **SH Prediction** (Python command-line app)

- Predicts players' roles in the social deduction game "Secret Hitler"

### **Pocket Cube Solver** (Arduino project)

- Robot to solve a  $2 \times 2 \times 2$  Rubik's Cube
- Presented at the 2018 Montreal Regional Science and Technology Fair
- Awarded the Intel Excellence in Computer Science Award and the McGill University School of Computer Science (Robotics) Award

## Selected Courses

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### Language-Based Security (COMP 523)

*Winter 2025*

- Formally studied the syntax and semantics of programming languages and type systems
- *Project:* [chick](#), a type checker for a dependently-typed language

### Computer Graphics (ECSE 532)

*Fall 2024*

- Learned the fundamentals of computer graphics: 3D transformations, meshes, the graphics pipeline, lighting, textures, etc.
- **Project:** a raytracer with support for surfaces of different colour and smoothness, mirrors, depth of field blur, spherical environment maps, textures, etc. Implemented in Python using the taichi library for GPU acceleration.

### Machine Learning for Engineers (ECSE 551)

*Fall 2024*

- Studied classical machine learning models (decision trees, naïve Bayes, etc.) as well as neural networks, CNNs, and RNNs
- **Project:** stacked classifier (with random forest, logistic regression, etc. as the base models) to categorize Reddit posts from four cities. Achieved the second-highest accuracy on the test dataset (out of 25 groups).

### Compiler Design (COMP 520)

*Winter 2024*

- Learned to implement a compiler, including parsing, semantic analysis, register allocation, and code generation
- **Project:** compiler targeting MIPS assembly from a subset of C

### Microprocessors (ECSE 444)

*Fall 2023*

- Programmed an STM32 B-L4S5I-IOT01A board using C and ARMv7 assembly
- **Project:** memory game that plays a series of tones (high or low), detects user inputs via accelerometer (up or down), and provides feedback via a speaker

### Parallel Computing (ECSE 420)

*Fall 2023*

- Learned GPU programming with CUDA
- **Project:** CUDA implementation of a general 2D cellular automaton simulator, achieving  $590\times$  higher throughput than an equivalent sequential implementation in C

### Operating Systems (ECSE 427)

*Fall 2022*

- Learned fundamental OS concepts: processes, threads, memory management, etc.
- **Assignments:** a simple shell, threading library, and file system (all in C)