

Martin Lecourt

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Internship at Concordia University

With Yann-Gael Guéhéneuc, professor

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John Molson School of Business, Université Concordia, Montréal

Concordia University, Gina Cody School and CSSE department

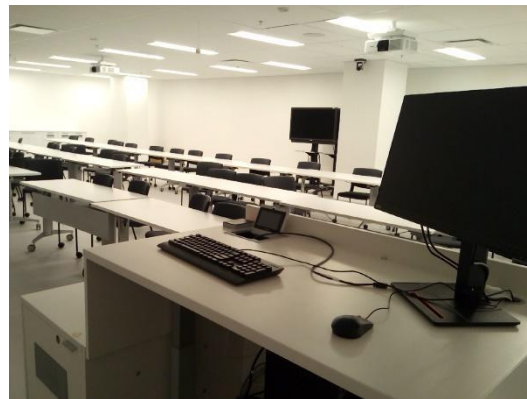
Located in Montreal downtown, Concordia University is mostly English-speaking even if it is in Quebec. It is one of the largest Canadian universities in terms of number of students. There are many buildings belonging to the university: two libraries, the FB building (human resources), the Hall building (classrooms), the EV building (labs, meeting rooms, and workshop), the ER building (computer science labs), etc. The university is divided into four faculties: Faculty of Arts and Science; Gina Cody School of Engineering and Computer Science; Faculty of Fine Arts; and, John Molson School of Business.

The Gina Cody School of Engineering and Computer Science, also known as Faculty of Engineering and Computer Science, is named after Gina Cody, a Canadian-Iranian engineer and business leader, who studied at Concordia and gave \$15 Millions to the university in 2018. The Faculty of Engineering and Computer Science is the largest of Concordia

The Computer Science and Software Engineering (CSSE) department is the one where I did my internship. This department has around 60 professors, who do research and teach at the three levels: bachelor (corresponding to Bac+5 in France); master (Bac+7), and Ph.D. (Bac+11). Master is divided into course-based master and research-based master.



The ER building



A classroom in the Hall building



The main library

The four duties of professors

Teaching: The professors give mostly lectures to up to 200 students for bachelors and course-based masters and to around 30 students for research-based masters and Ph.D. The students choose their classes that they like or are useful, except for the bachelors, who have core courses to follow to complete their degrees.

Research: Graduate students (masters and Ph.D.) do research with the professor's help to obtain their masters or Ph.D. The research is based on projects that the students choose. Every student has his own project, but the projects overlap so students help each other. The professors also do their own research, often with colleagues. They can also work with researchers from other countries.

Services: They can also do services, like giving a class in another university or organize conferences. The purposes of this kind of service are to contribute to the community and to network, for example to find students who want to work on some topics of interest. Mr. Guéhéneuc is also in the BCI (Bureau de la Commission Inter-universitaire) that approves the quality of new university programs but not only in computer science, so he can discover new topics.

Funding: The last duty of professors is to submit grant applications to find funds for their students' research or their own research. The grant agencies are mostly public organisations, like the City of Montreal or the Canadian government, or even international institutions. The funds support the students, but the professors can only use them to buy materials, attend to classes, etc. because they are already paid by the university and the government. This system allows the professors to run projects and pay students during their long studies.



The office of Mr. Guéhéneuc

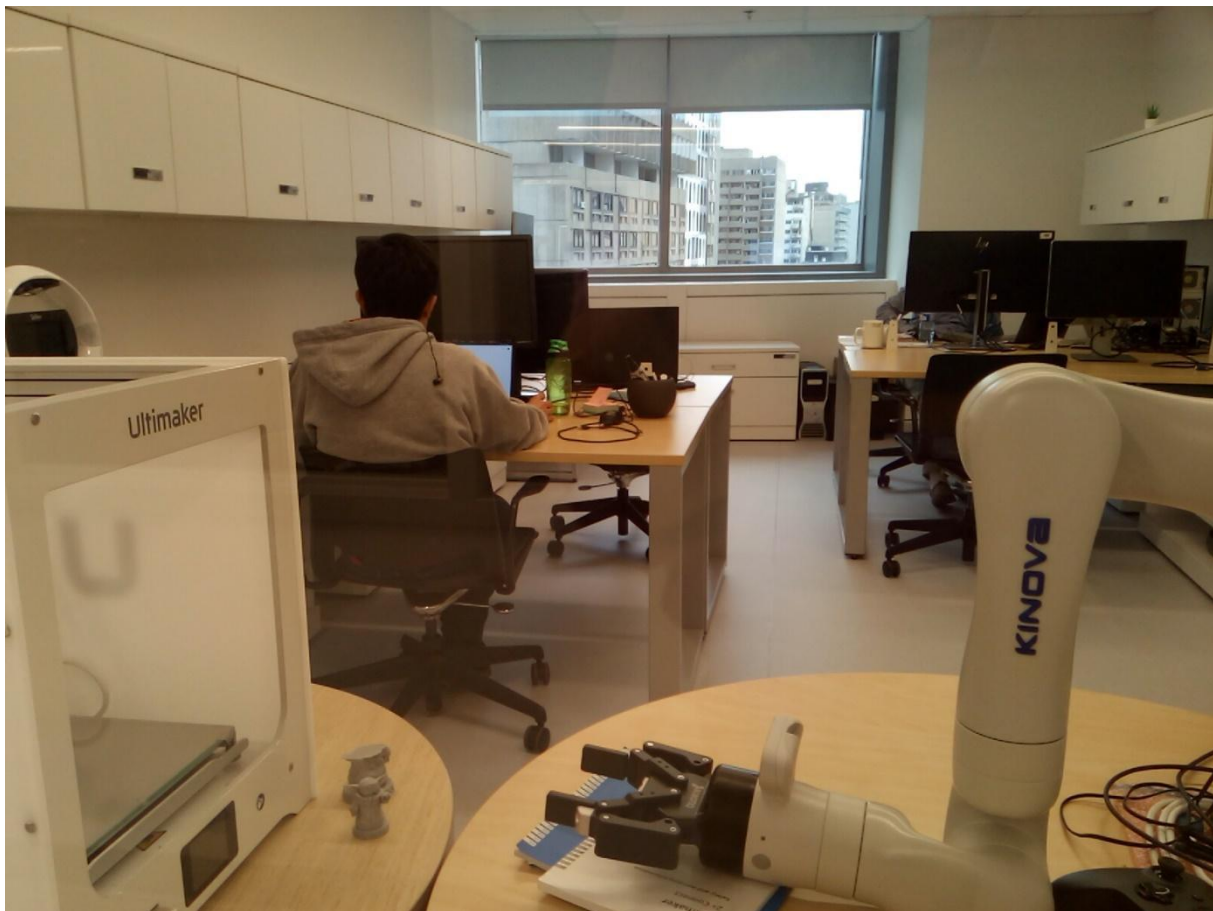
Work organisation

Mr. Guéhéneuc supervises the research of twelve students and a French intern. Some students do not live in Montreal but come to the university sometimes and a few students live abroad so they cannot be present at the university. Most Montreal students are at the university every day, but others prefer to work at home and come only to talk to their professors.

Because of these many cases, most meetings are online, in particular the Tuesday-morning meeting, where each student reports on the progress of his research and one of them makes a presentation on a topic (related or not with his research). For example, during the meeting of the 28th of June, a student presented the concept of a “state machine”.

In the lab, there are equipment that the students can use in their research: a 3-D printer, a robotic arm, moving robots, Arduinos, and Raspberry Pis (programmable microcontroller), tactile screen, and other IoT (Internet of Things) devices, like connected lamp or smartwatch.

A typical day of Mr. Guéhéneuc work: At the beginning of the day, he answers his emails, from students, colleagues, administration, etc. Then, he talks with students about their research and often about their papers. After lunch, he goes to teach his class for three hours or opens his office so that students can ask him questions or discuss their research.



The lab in the ER building

Publications

The purpose of research is to contribute to the community, so research is nothing without publications. Publications are used to spread research results and the way to obtain them so other researchers and students can use them in their own research. They show that the students have advanced knowledge.

They are also used to get to be known. The journals that publish them do not pay the researchers for their papers, but the reward is that the researchers can say he published in this journal to get a job or to obtain funds for another research project. The more the journal is known, the more a publication has high value.

Currently, publications are not free. We must subscribe to the journals to have access to the publications, although the researchers and reviewers work for free. This system hinders research, especially in undeveloped countries. In the last few years, there were projects to provide free access to publications. The most important is Sci-Hub, "The Robin Hood of science", with 85 millions publications collected by web-scraping, bypassing the publishers' paywalls. Sci-Hub has been lauded by some in the scientific, academic, and publishing communities but publishers, like Elsevier, often file lawsuits for copyright infringement against this clandestine library. Sci-Hub is still online, under a different domain name, and helps researchers all around the world (about 400,000 requests per day).

« To remove all barriers in the way of science »



The logo and the slogan of Sci-Hub

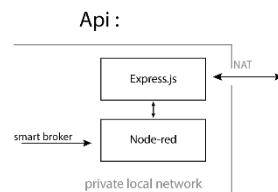
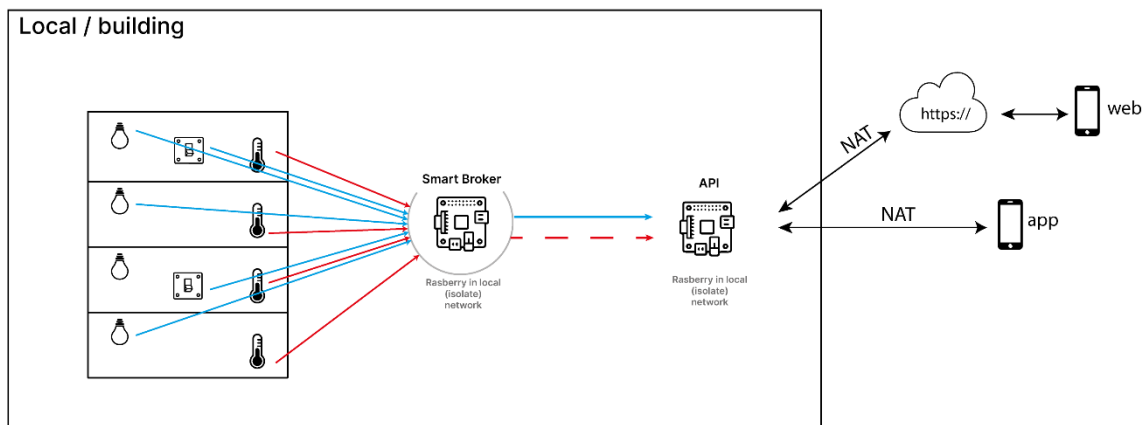
Example of a research project

A project is the research project of Eloi Menaud, a French student in engineering school coming to Concordia for his internship. Mr. Guéhéneuc talked to him about the project, and he agreed to work on it. Before developing and programming, he had to determine the needs to which the service responds and the different parts of the system that he must implement.

The name of the project is WIMP (Where Is My Professor). This system informs students when they can talk to their professor, based on Mr. Guéhéneuc's location, his planning, the number of people in his office, and the state of his door (open or closed). Students should not have access to his private life, so his location is shared only if he is 100 meters around Concordia, only his professional planning is shared, etc.

Students have access to a website and an app on their phone and the local server is hosted by a Raspberry Pi in the lab. The location of Mr. Guéhéneuc is obtained by the GPS of his phone, his planning is obtained by the API (Application Programming Interface) of Google Calendar, that allows to collect easily plannings and events and the number of people in the office and the state of the door are obtained by IoT devices, that collect data and send it to the server.

The objective of the project for Eloi is to work with APIs, data confidentiality and IoT services to develop skills related to these domains and learn how to manage a project.



general physical structure of the project

Conclusion

A professor teaches but can also do his own research thanks to public funds. He can learn from his students' research. He can be known with his publications and his services. The large community allows him to do research with other countries, to have different points of view, to find people who want to work on projects of interest, to help each other. He can share his research with the community and use others' research thanks to publications. Thus, he can advance knowledge.