
Education

- 2020 **Master's degree in bio-informatics**, *Université de Montréal*, Canada.
- Excellence scholarship from Faculté des études supérieures et postdoctorales
 - Software engineering applied to data science
- 2020 **Fundamentals of remote sensing and geospatial analysis**, Udemy.
- Certificate
- 2019 **Discover best practice farming for a sustainable 2050**, *University of West Australia*, Coursera.
- Certificate
- 2001-2006 **Master's degree in electrical engineering**, *ISEP (Institut Supérieur d'Electronique de Paris)*, France.
- Software engineering
 - Digital and analog electronics
 - Mathematics
 - Minor in microelectronics (ITESM Monterrey, Mexico 2006)

Experience

- Oct 2017 **Data scientist**, *Montreal Heart Institute*, Canada.
to Oct 2020
- Data science in a research environment
 - Python, Rust, R, Haskell, cluster management
 - Developed and implemented statistical methods to find correlations between rare genetic variants and physical traits, while accounting for population structure and kinship (principal component analysis, linear mixed model)
 - Evaluated a Bayesian framework to integrate the result of several biochemistry experiments, and identify the causal genetic mutations from a list of candidate mutations (Markov chain Monte Carlo, fine-mapping)
 - Applied a clustering algorithm to DNA-DNA contact matrices to identify densely packed DNA regions
 - Publications:
 - find-tfbs: a tool to identify functional non-coding variants associated with complex human traits using open chromatin maps and phased whole-genome sequences
 - Integrative analysis of vascular endothelial cell genomic features identifies AIDA as a coronary artery disease candidate gene
- Jan 2017 **IoT R&D**, *Core Migration*, Montreal, Canada.
to Sep 2017
- Creation of an IoT board (electronics+software) for automation and monitoring
 - Scala, C++, Arduino, Raspberry Pi
 - Wireless protocols: ZWave, Modbus, Bluetooth, Zigbee
 - Deployed a prototype in a retail environment
- Nov 2014 **Scala developer/Devops**, *Triton Digital (Radio streaming)*, Montreal, Canada.
to Jan 2017
- Created a datawarehouse with descriptive analytics tools (Scala, Spark, Parquet, Looker, Kafka)
 - Created a high-availability distributed infrastructure with real-time monitoring (Docker orchestration, microservices, systemd, Ansible, Datadog, Consul, Marathon, AWS, Cassandra)
 - Optimized the continuous delivery pipeline (Jenkins, Artifactory)
 - Automated the billing system of streaming services and created a graphical UI for the accounting department (Elm frontend)

- May 2011 to Nov 2014 **Consultant**, *Octo Technology*, Paris, France.
- Tech lead in a full-stack project (AngularJS, HTML5, Play)
 - Audited the products of several software vendors (electronic banking, insurance): performance, network security, software architecture
 - Optimized the hardware and licensing costs of a banking system's databases
 - Assisted the digitalization effort and improved the workflow of a specialized press group
 - Designed an IT consolidation strategy for a public transport software vendor
 - Led interviews of our clients' management and technical teams to recommend technological and workflow improvements
 - Introduced Agile methodologies in a telecom company, and coached the business and engineering teams
 - Benchmarked massively parallel databases to select a vendor and start a datawarehouse project
 - Designed and implemented a testing strategy for a mainframe-based information system, to enable refactoring
 - Wrote commercial proposals
 - Organized programming courses for colleagues (Haskell language)
 - Performed technological watch on distributed/real-time/NoSQL databases
 - Wrote several articles for the corporate blog:
 - Software transactional memory
 - Equivalence of GoF design patterns in Haskell
 - An essay on functional databases
 - Analysis of the SQLFire database
 - Bloom filters
- May 2010 to May 2011 **C++ developer**, *Valerian*, Paris, France.
- Ported the C++ codebase from AIX to Linux (800 kLoC)
 - Adapted the code to a virtualized environment
 - Migrated the storage from C-ISAM to MySQL
 - Created an alternative proposal for a rewrite in Haskell
- Oct 2008 to May 2010 **Python/C++ developer**, *BNP Paribas CIB*, Paris, France.
- Created a custom columnar database for the quantitative research teams
 - Added data enrichment (trade signing, liquidity)
 - Automated data exports to the Compliance department
- June 2006 to Aug 2008 **Python/C developer**, *TimeTracker*, D.F, Mexico.
- Created a biometric device, control server and network protocols from scratch:
 - User interface (GTK, Stackless Python)
 - Predictive algorithm and image processing to enhance fingerprint recognition
 - Network protocol between the biometric devices and the control server
 - Custom P2P protocol for heavy files sharing between biometric devices
 - Lisp-based extension language for clients' custom rules
 - Initiated beginner Python courses
 - Administrated the working system and integration with the company front-end

Skills

Programming Languages	Python, C, C++, Haskell, Rust, R, Scala, Java, Common Lisp, Assembly, VHDL, Javascript, Elm
Databases	SparkSQL/Parquet, Cassandra, Oracle, Teradata, Sybase IQ, MySQL, SQLite, SQLFire, Tokyo Cabinet
Devops	Ansible, Docker, Datadog (monitoring), Nix, Systemd, Marathon/Mesos, Consul, Serf, AWS, Continuous deployment
Bioinformatics	VEP, SnpEff, Bcftools, ANNOVAR, CADD, EPACTS, PLINK, PyMOL, Blast, NCBI, PAINTOR, SnakeMake
Electronics	ZWave, Modbus, Bluetooth, Zigbee, Arduino, Raspberry Pi
OS	Debian, Centos, NixOS

Languages

French Mother tongue

English Fully proficient (TOEIC: 915/980, IELTS: 7.5/9)

Spanish Proficient (3 years living in Mexico)

Open source contributions

Author haskell-linode, wai-middleware-metrics, find-tfbs, find-knockouts
Contributor Idris, docker-hs, PAINTOR, NixOS