Loïc **Tetrel**

Montréal (QC), CANADA

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***Data science engineer** (M. A. Sc.) specialized in applied **medical imaging research**.*
*I define myself as a **curious** and **autonomous** person with ease in **communication**.*

Professional profile

MRI, ultrasound, HPC & GPU/CPU, machine learning, statistics, open source, image/volume registration, 3D reconstruction and rendering, epipolar geometry, optical calibration, tracking, camera optics, computer science.

Education

ÉTS (École de technologie supérieure) Montréal (include McGill course) — *Montréal, CANADA*

M. A. Sc. in Electrical Engineering, graduated with honors — *Sept. 2014 - Aug. 2016*

Lyon INSA (National Institute of Applied Sciences of Lyon) — *Lyon, FRANCE*

M. Eng. in Electrical Engineering — *Sept. 2012 - Aug. 2016*

IUT (University Institutes of Technology) Lyon 1 — *Lyon, FRANCE*

Technical degree in Industrial Engineering and Maintenance, graduated with honors — *Sept. 2010 - Jun. 2012*

Skills

Low-level programming	Bash, C++11 (OpenCV, Ceres, Boost, Eigen), CUDA, Assembly
High-level programming	Python (numpy, tensorflow, jupyter), MATLAB (statistical and ML toolbox)
Softwares	SLURM, Git, Docker, Kubernetes, Visual Studio 2017, LaTeX, Blender, 3D slicer
Operating systems	Ubuntu 18.04, Windows 10
Languages	French (mother tongue), Polish (fluent), English (professional, TOEIC 925), Spanish and Arabic (basics)

Work Experience

SIMEXP lab, CRIUGM - University of Montreal (UdeM) — *Montréal (QC), CANADA*

Data Science Engineer (*): Academic research — *Nov. 2018 - PRESENT*

- Software tools for neuroimaging research. `https://github.com/SIMEXP`
  - HPC Scalable fMRI preprocessing and quality-control on BIDS datasets for CCNA (fMRIPrep, SLURM, Datalad)
  - fMRIPrep Long-term Support (Datalad)
- Machine learning for applied neuroimaging research.
  - [1] Fast and accurate fMRI registration with quaternions using convolutional neural network (tensorflow)
  - [2] Intel collaboration for CPU and GPU HPC distributed training of brain-state annotation (Horovod, SLURM)
  - Feature visualization for [3] brain-state annotation on deep graph convolution (tensorflow)
- CONP-Neurolibre: [4] open and interactive neuroscience notebooks on the cloud. `https://binder.conp.cloud/`
  - Server administrator for the McGill Kubernetes cluster (Binderhub, openstack, terraform, Docker)
- Communication (oral presentations, hackaton trainer, student support), open-science practices and contributions (Nilearn, Binderhub)
- Conferences attendance (MAIN 2018-19-20, OHBM 2019-20-21)

Dental Wings/Straumann Group, Digital Business Unit — *Montréal (QC), CANADA*

Software Developer (*): 3D solutions for digital dentistry. — *Dec. 2016 - Oct. 2018*

- 3D reconstruction algorithms
  - State of the art research on stereoscopy using phase-shift model (C++, Ceres, Eigen)
  - Optical calibration (openCV, Ceres) and distorsion correction (Python)
  - Metrology reports and software documentation
  - Conception of a virtual scanner for software experimentation and hardware validation (Blender)
- Conferences attendance (CVPR 2018, Agile Tour 2017), open days for recruiting interns (Concordia, Polytechnique, McGill)

LATIS, ÉTS Montréal — *Montréal (QC), CANADA*

Research assistant (*) : Graph-based estimation of probe trajectory for sensorless freehand 3D US. — *Jan. 2015 - Nov. 2016*

- Calibration of optical and electromagnetic probes for freehand 3D US (C++, PLUS, SVN, CMake)
- [5] Master thesis: [6] Sensorless image reconstruction for ultrasound
  - Image registration from echographic sequence using speckle-decorrelation (C, GSL, Make)
  - Trajectory estimation by a directed graph with gaussian process uncertainty and Lie Algebra (Matlab, C++, Boost, Eigen)
- Conferences attendance (REPARTI 2016, MICCAI/MLMI 2016)

(*) References available upon request.

Thales Group, Thales Air Systems *Limours, FRANCE*

Intern (*) : Fast initialization of cartesian track using FM band *Feb. 2014 - Aug. 2014*

- Track initialization in cartesian coordinates with range measurements, using a custom non-linear filter and statistical methods (MATLAB)
  Validation on aircraft records (MATLAB MEX, C++, Eigen)

Relevant Projects

- Co-funder of `https://bitprobe.io/`, bitcoin price forecasting using blockchain features (tensorflow).
- Computer science blog (jupyter notebooks, HTML, Markdown) `https://ltetrel.github.io/`.
- Home-made stream media server (jellyfin).
- Automatic toolbox to process SRT subtitles (synchronization, translation) from a movie (tensorflow, spleeter).
- Design of an autonomous robot's detection system (C, Altium) for an international amateur robotics contest (Eurobot).

McGill, ÉTS Montréal *Montréal (QC), CANADA*

2014 - 2016

- Registration of MRI and CT images using Gaussian Process interpolation with uncertainty.
- GPGPU and GPU architecture introduction, Sobel filtering development using CUDA (NPP) on Nvidia GTX.
- Automatic classification and prediction models for early Parkinson disease. Features extracted from SPECT nuclear images of patient's brain.

Volunteer Experience

Hacking Health Montreal *Montréal (QC), CANADA*

Event volunteer *Oct. 2016 - Dec. 2016*

- Promote innovations between health and science. Helped the organization of HIP Ottawa 2016 in CHEO-OCTC.

Big Band ÉTS *Montréal (QC), CANADA*

Event coordinator and guitarist *Sept. 2015 - Aug. 2016*

YES (Young Employees Society) Thales *Limours, FRANCE*

Member *Feb. 2014 - Aug. 2014*

- Young professional events. Thales trainees forum day.

ClubElek (Lyon INSA) *Lyon, FRANCE*

Beginner team manager *Sept. 2012 - Jun. 2013*

- Coordinator assistant for InnoRobo Lyon 2013.

IUT Lyon 1 *Lyon, FRANCE*

Free tutoring in mathematics *Sep. 2010 - Jun. 2012*

Publications, Conferences & Awards

Jun, 2021	**OHBM,** [1] Fast and accurate EPI spatial normalization using convolutional neural network (poster 2325)	*Online*
May, 2021	**NeuroImage,** [3] `https://www.sciencedirect.com/science/article/pii/S1053811921001245`	*Online*
Jun, 2020	**OHBM,** [4] NeuroLibre : A cloud-based and curated repository for Jupyter Notebooks in neurosci. (poster 1902)	*Online*
Feb, 2020	**Courtois Neuromod event,** [2] Benchmarking 3D-CNN models for brain decoding on CPU servers.	*Montréal (QC), CANADA*
Jun, 2018	**CVPR,** Promoting computer vision research for Staumann.	*Salt Lake city (UT), USA*
Nov, 2017	**Agile Tour,** Training for agile development.	*Montréal (QC), CANADA*
Mar, 2016	**Grant,** Bourse interne ÉTS : merit scholarship for graduate students (3.000 CAD).	*Montréal (QC), CANADA*
Oct, 2016	**MICCAI,** [6] `https://link.springer.com/chapter/10.1007/978-3-319-47157-0_25`	*Athens, GREECE*
Aug, 2016	**Master thesis,** [5] `https://espace.etsmtl.ca/id/eprint/1753/`	*Montréal (QC), CANADA*
May, 2015	**24h de l'innovation (1st place),** Mobile app to teach science for children.	*Montréal (QC), CANADA*
Aug, 2014	**Explora'sup grant,** Regional merit scholarship for undergraduate students (2.000 EUR).	*Lyon, FRANCE*
May, 2013	**Eurobot (qualification phase),** International robotic contest with autonomous robots.	*La Ferté B., FRANCE*

Interests

Travels Europe (France, Poland, England, Spain, Germany, Greece, Switzerland), USA (UT, FL, CA, NV, NY), Canada (QC, ON, BC), Asia (Thailand)

Hobbies IT (video games, computer vision, blockchain), politics, reading books (fantasy, SF), playing music (rock, jazz)

Sports Weight training, ski, salsa dance