

Laure Delisle

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https://scholar.google.com/citations?user=fCw7_7cAAAAJ

Independent, driven and fast-learning ML PhD Student with two Master's degrees and professional experience in AI startups. Passionate about **social good**, Laure led key projects to help end the Darfur crisis and fight verbal abuse on social media. Her research interests revolve around **scarce labeled data regimes** (semi/weakly-supervised learning) and **computer vision**.

Education

- 2021-2025 **PhD Student in Computing and Mathematical Sciences – Caltech**, Pasadena, USA
✓ *Pietro Perona's group (Computer Vision + ML)*
✓ **Kortschak Fellow: 2y scholarship and mentorship**
- 2016-2017 **Master of Data Science – Illinois Institute of Technology**, Chicago, USA (GPA: 3.55)
2012-2017 **MSc/BSc in CS & Engineering – ESIEA**, Paris, France (GPA: 4.0 - **top overall student**)

Research

Research Interests

Scarce-Labelled-Data Regime: few-shot learning, semi-supervised learning, weakly-supervised learning, learning with noisy labels.
Computer Vision: object detection, image/instance segmentation, image classification.
Applications: AI for social good, UN Sustainable Development Goals (SDGs), defense of human rights, cybersecurity.

Publications – * denotes equal contribution

- Delisle, L*, Kalaitzis, A*, et al., 2018. ***A large-scale crowdsourced analysis of abuse against women journalists and politicians on Twitter***. In Neural Information Processing Systems (NeurIPS), 2018 Workshop on AI for Social Good.
- Boquet, T*, Delisle, L*, et al., 2019. ***Reproducibility and Stability Analysis in Metric-Based Few-Shot Learning***. In International Conference on Learning Representations (ICLR), 2019 Workshop on Reproducibility in Machine Learning.
- Boquet, T*, Delisle, L*, et al., 2019. ***DECoVaC: Design of Experiments with Controlled Variability Components*** [preprint].
- Delisle, L*, Chotzen, D*, Guth, D* et al., 2021. ***Gold Busters: Detecting Illegal Mining with Computer Vision*** [unpublished].

Projects

Gold Busters (Q2 2021, sup. Pietro Perona, Caltech)

Localized mining activities in Venezuela from aerial imagery:

Built data pipeline from Google Earth with custom data engineering and filtering to minimize cloud coverage in retrieved images. Detected mining locations by fine tuning a ConvNet pre-trained on satellite imagery using Seasonal Contrast.

Decode Darfur (Q2-Q3 2019, sup. Julien Cornebise, Element AI)

Helped Amnesty International quantify destruction in the Darfur ethnic cleansing:

Detected human presence in Darfur using noisy crowd-sourced labels and free low resolution satellite images. Leveraged sub-pixel information for image classification, using multiple low res images of given location fused as embeddings.

Troll Patrol (Q3-Q4 2018, sup. Julien Cornebise, Element AI)

Helped Amnesty International raise awareness about toxicity against women on social media:

Quantified online verbal abuse against women using crowd-sourced labels, in collaboration with social scientists. Performed Importance sampling rare class dataset enrichment, post importance sampling re-weighting for quantitative analysis.

Vehicle detection (Q1 2019, sup. Julien Cornebise, Element AI)

Helped Human Rights Watch monitor military activity in civilian areas:

Detected moving vehicles on satellite video via optical flow, improved performance using pixel registration stabilization.

Few-shot learning (Q1 2019, sup. Julien Cornebise, Element AI)

Analyzed the reproducibility and stability of Prototypical Networks (Snell et al., 2017):

Quantified the variability in the error linked to the random seed and the repeat under deterministic behavior control. Developed a systematic method for evaluating models, expanded results to further few-shot learning algorithms.

Skills

Languages and packages – Python (7 years), PyTorch (4 year), sklearn, numpy, pandas, ggplot2, matplotlib, C, bash.

Machine Learning – Deep learning (CNNs), computer vision (classification, detection, segmentation), unsupervised learning, hyperparameter search, importance sampling, representation learning, weakly-supervised learning, data programming.

Tools, Misc. – LaTeX, Git, PR/code reviews, Vim, Mathematica, HTML/CSS/Javascript, SQL, Docker, ssh.

Research skills – Poster presentation, paper writing, Agile project management, mentoring, teaching, research ideation.

Languages – English (TOEFL 119/120), French (native), Italian (fluent).

Work

Research Engineer – [Element AI](#)

Feb 2018-Oct 2019

Tackling Human Rights violations using AI (see also the [Research - Projects](#) section)

United Kingdom

Built the AI for Good team as 1st research engineer with Dr Julien Cornebise. Helped grow a multi-disciplinary team of 12 over 1.5 year. Led Decode Darfur (main research engineer) and Troll Patrol (project lead) projects with Amnesty International. Conducted research on few-shot learning algorithms (RML@ICLR 19). Customer audit workshop with Amnesty international leading to a [white paper](#) (Ryan, M. and VanAntwerp, S. 2019. [AI-Enabled Human Rights monitoring](#)).

✓ *Classification – Computer Vision – Deep Learning – Few-Shot Learning – PyTorch – Scikit-learn – Pandas*

Data Science Intern – [Lastline Inc](#)

Oct-Dec 2017

Cluster consistency evaluation

United States

Gained understanding about malware detection and file clustering, established the project scope. Identified relevant data sources, aggregated data from multiple sources: MySQL databases, Cassandra keyspaces. Performed data cleaning, feature extraction, computed consistency metrics, created dataviz.

✓ *Data wrangling – Data cleaning – Dataviz – Python*

Data Science Extern – [Uptake](#)

June-July 2017

Anomaly detection in a water treatment plant

United States

Combined sensors/actuators data (52 features, 900k samples) with network logs (semi-structured, ~50M samples) from the SWaT Industrial plant cyber-attack dataset. Conducted data analysis and classification benchmark, selected Gradient Boosting, tuned stratified sampling window length using F1 score.

✓ *Classification – Python – Scikit-learn – Pandas – GGplot2*

R&D Intern – [Atomic Energy Commission \(CEA\)](#)

Apr-July 2016

Conception of a scalable stateful network scanner

France

Benchmarked event programming libraries: libevent, libev, libuv. Designed the software macro architecture. Implemented a proof of concept combining asynchronous and event programming. Advocated the project to 60+ colleagues, managers and heads of department.

✓ *Event programming - Parallel computing architecture - Port scanning - C*

R&D Intern – [Airbus Defence & Space](#)

June-Aug 2015

Anomaly detection on network logs

France

Designed and developed a tool detecting stealth signals from network metadata. Engineered a cold start system able to work with no labels nor IDS signatures. Presented results to 100+ colleagues and managers.

✓ *Clustering algorithms - Python - Network protocols – Elasticsearch*

Personal Interests

STEM outreach – [Hacking event NDH Kids](#), Founder, General Chair (2014, 2015), Advisory Board (2016)

Created the first non-for-profit free STEM+Hacking event for children in France (50 attendees, 6 workshops, \$2000 budget). Championed diversity and inclusion efforts (gender parity, socio-economic diversity, accessible for children with disabilities) through school outreach, social media advertisement, venue and workshop adaptation. Managed 20 volunteers.

WiML (Women in Machine Learning) – ICML'20 WiML workshop session facilitator.

Mentoring – Volunteer mentor for Masters students for a 2-year period: career development, resume review, technical mentorship, internship-school liaison, thesis committee member (3 graduated, 4 ongoing).

Alma mater Board Member – [Ecole Supérieure d'Informatique Electronique Automatique](#), Alumni-representative on the board Led the research roundtable of the 2030-horizon strategic retreat, reviewed and approved new building proposal (86k sq. ft, \$40M investment), attend monthly meetings (\$19M annual budget, 1100 students, 25 board members).

Hobbies and interests – Surfing, rock climbing, hiking, roadtripping, foosball, Rubik's cube, Cubism, cheese, gelato.