Mayalen Etcheverry

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Research Interests

Curiosity-Driven Artificial Intelligence • Representation Learning • Automated Discovery in Science • Healthcare

Education

INRIA, Flowers team | Poietis company — Bordeaux, FR
Ph.D. in Machine Learning, Advisor: Dr. Pierre-Yves Oudeyer — 2020–Current
- Thesis: "Automated Discovery of Self-Organized Structures in Morphogenetic Systems"

University College of London (distinctions, GPA: 4.0/4.0) — London, GB
M.Sc. in Computer Vision, Computer Graphics and Imaging — 2016–2017
- Thesis: "Making parametric models of buildings easier to edit by predicting future edit patterns in the Open3D platform", Thesis Supervisor: Dr. Paul Guerrero

Télécom ParisTech, Top-ranked French school in digital technologies **(GPA: 3.6/4.0)** — Paris, FR
M.Eng. in Computer Graphics (major) and Data Science (minor) — 2014–2017
B.Sc. in Computer Science

Engineering School Preparatory Classes (GPA: 3.8/4.0) — Bordeaux, FR
Undergraduate program in mathematics and physics to prepare the national competitive entrance exams to the *Grandes écoles* — 2012–2014

R&D Work Experience

INRIA, in the Flowers project-team — Bordeaux, FR
Research Engineer, Supervisor: Dr. Pierre-Yves Oudeyer — 2018 –2020
- Unsupervised Representation Learning for Intrinsically-Motivated Exploration of Complex Systems.
- Development of a modular and dynamic network architecture where a hierarchy of behavioral characterization spaces is progressively constructed, allowing flexible representations and intuitive guidance during the discovery process.

Siemens Healthineers — Princeton, USA
Research Scientist Intern, Supervisor: Dr. Bogdan Georgescu and Dr. Sasa Grbic — 2017-2018
- Deep Learning for organ segmentation in 3D CT Scans: responsible for implementing the preprocessing/training/evaluation pipeline for 10 organs. Practical Experience with Large Databases.
- Research and development of a deep reinforcement-learning algorithm for localizing anatomical structures in 3D images.

Publications

[1] **M. Etcheverry**, C. Moulin-Frier, and P.-Y. Oudeyer, "Hierarchically organized latent modules for exploratory search in morphogenetic systems", *Neural Information Processing Systems (NeurIPS)*, 2020.

[2] C. Reinke*, **M. Etcheverry***, and P.-Y. Oudeyer, "Intrinsically motivated discovery of diverse patterns in self-organizing systems", in *International Conference on Learning Representations (ICLR)*, 2020.

[3] **M. Etcheverry**, B. Georgescu, B. Odry, T. J. Re, S. Kaushik, B. Geiger, N. Mariappan, S. Grbic, and D. Comaniciu, "Nonlinear adaptively learned optimization for object localization in 3d medical images", in *Deep Learning in Medical Image Analysis and Multimodal Learning for Clinical Decision Support*, Springer, 2018, pp. 254–262.

Workshop Papers and Abstracts

[4] **M. Etcheverry**, P.-Y. Oudeyer, and C. Reinke, "Progressive growing of self-organized hierarchical representations for exploration", *ICLR Workshop - Beyond "Tabula Rasa" in Reinforcement Learning (BeTR-RL)*, 2020.

[5] **M. Etcheverry**, B. Georgescu, B. Odry, T. J. Re, S. Kaushik, B. Geiger, N. Mariappan, S. Grbic, and D. Comaniciu, "Nonlinear adaptively learned optimization for object localization in 3d medical images", *NeurIPS Workshop - Medical Imaging Meets NeurIPS (MED-NeurIPS)*, 2018.

Patents

[6] **M. Etcheverry**, B. Georgescu, S. Grbic, D. Comaniciu, B. L. Odry, T. Re, S. Kaushik, B. Geiger, and M. S. Nadar, *Adaptive nonlinear optimization of shape parameters for object localization in 3d medical images*, US Patent App. 16/270,918, 2019.

Academic Projects

See full list of projects and corresponding resources here.

- Open-Innovation Program (FIRST, 2016)
  Selected and coached by BNP-Parisbas, Orange and Nokia. Interdisciplinary team of engineers, designers and managers. Designed and implemented an interactive Runner Game in **C++/OpenGL**. Tracking of the player's finger with infrared LED. Project was displayed at Paris Center for digital creation.
- M.Sc. Final Research Project (May-Sep 2017)
  Learning edit patterns of a procedural model's parameters to assist in modeling buildings in the Open3D plaform. **(C++/Eigen/QT)**.
- M.Sc. main projects (2017)
  - **Vision:** Segmentation, panoramas, tracking systems, dense stereo, 3D reconstruction, visual SLAM **(Matlab)**
  - **Image/Video:** Poisson Editing, NLM, restoration of old films, multiview video textures **(Matlab)**
  - **3D Geometry:** ICP, Smoothing **(C++/Eigen/OpenGL)**
- Inverse Kinematics (Team of 4, June 2016)
  - IK system to predict the most likely 3D body pose given a set of constraints, learned model of human poses.
  - Tool to visualize the resulting animations **(QT/OpenGL)**.

Skills

- **Programming:**
  - Python, PyTorch
  - C / C++, openGL, GLSL
  - Matlab, Qt
  - Flask, HTML, CSS, JavaScript
  - Git
- **Typesetting:** LaTex
- **Operating Systems:** Linux / macOS

Languages

- **French:** native speaker
- **English:** advanced
  - **TOEFL:** score of 102/120
- **Spanish:** advanced
  - **OIB:** International Option Baccalaureate with Honors
- **Serbo-Croatian:** elementary

Extracurricular Activities

- Co-founder of the video association of Telecom ParisTech 2015 –2016
  Film realisations and projection events attended by all the students. Now taken over by other students.
- Realisation of a poster about gender stereotypes Spring 2016
  National competition for all Grandes écoles students to reflect on persistent stereotypes. Won the jury "coup de coeur" prize.
- Mathematics private classes to high-school student girls 2016–2018