Hugues Van Assel

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30/06/1997

Current Position

2021–... **Ecole Normale Supérieure de Lyon**, *PhD*, Mathematics Department, Advisors: Aurélien Garivier, Titouan Vayer. Recurrent Collaborators: Rémi Flamary, Nicolas Courty.
Unsupervised Learning with Graphical Models and Optimal Transport. Focus on challenges arising from single-cell genomics.

Education

2020–2021 **Ecole Normale Supérieure Paris-Saclay**, *Master 2 Research*, *Applied Mathematics*, *MVA*.

2017–2020 **Ecole polytechnique**, *Cycle ingénieur, Master of Science*, *Applied Mathematics*.

2015–2017 **Lycée Sainte Geneviève Versailles**, *Preparatory Program*.

Publications

Preprints

2024 Hugues Van Assel, Cédric Vincent-Cuaz, Nicolas Courty, Rémi Flamary, Pascal Frossard, and Titouan Vayer. Distributional Reduction: Unifying Dimensionality Reduction and Clustering with Gromov-Wasserstein Projection. *Preprint*, 2024.

Conference Proceedings

2023 Hugues Van Assel, Titouan Vayer, Rémi Flamary, and Nicolas Courty. SNEkhorn: Dimension Reduction with Symmetric Entropic Affinities. **NeurIPS**, 2023.

2022 Hugues Van Assel, Thibault Espinasse, Julien Chiquet, and Franck Picard. A Probabilistic Graph Coupling View of Dimension Reduction. **NeurIPS**, 2022.

Workshops

2023 Hugues Van Assel, Cédric Vincent-Cuaz, Titouan Vayer, Rémi Flamary, and Nicolas Courty. Interpolating between Clustering and Dimensionality Reduction with Gromov-Wasserstein. *OTML@NeurIPS*, 2023.

2023 Hugues Van Assel, Titouan Vayer, Rémi Flamary, and Nicolas Courty. Optimal Transport with Adaptive Regularisation. *OTML@NeurIPS*, 2023.

Patent

2023 Vincent Moens, Hugues Van Assel, and Haitham Bou-Ammar. Apparatus and method for training parametric policy, 2023. US Patent App. 18/364,601.

Open Source Contribution

2024–... **TorchDR**, *Pytorch Dimensionality Reduction toolbox (in development)*, Creator with Rémi Flamary and main maintainer.
Efficient, modular, documented and properly tested library for dimensionality reduction (DR). Provides a unified toolbox for DR. Supports research in DR. Written in pytorch in a highly modular way, such that practitioners can easily swap components, transform them or write new ones.

Teaching

2021-...   **Teaching assistant**, *Ecole Normale Supérieure de Lyon*.
- Preparing (master) students for the "agrégation" competitive exams in mathematics. Teaching sessions related to integration and probability.
- Teaching the exercise sessions of introduction to ML for master students.

2021-2022   **Teaching assistant**, *Université Claude Bernard Lyon 1*.
- Teaching the exercise sessions for bachelor students in statistics.

2018-2021   **Khôlleur in preparatory classes**, *Lycée Sainte Geneviève Versailles and Lycée Carnot Paris*.
- Examinations in Mathematics and Physics for second-year students preparing for competitive entrance exams to France's *Grandes Ecoles*.

Internships

2020-2021   **Institut Pasteur**, *Part-time Research Assistant, Decision and Bayesian Computation team*, Paris, Supervised by Jean-Baptiste Masson.
- Modelled behavioral structure of animal motion through deep latent embeddings using variational temporal convolutional networks, outperforming previous RNN-based approaches.

Summer 2020   **Huawei Noah's Ark Lab**, *Research Intern, Reinforcement Learning team*, London, Supervised by Vincent Moens and Haitham Bou-Ammar.
- Worked on regularised policy gradient estimation for model-based reinforcement learning. Resulting in a patent.

Summer 2019   **IBM**, *Intern, Extreme Blue program*, Paris.
- Worked on explainable time series forecasting models for industrial applications.

Awards

2021   AMX doctoral grant for PhD at ENS Lyon.

2020   Outstanding Leadership and Outstanding Investment Awards bestowed by Ecole polytechnique.

Miscellaneous

2018-2019   **Student Associations**, *Vice President of Ecole polytechnique Junior Enterprise (XProjets), Debater at French Debating Association league, Organizer of orientation week*.

2017-2018   **Military training**, *Officer Cadet in the Armed Forces, Saint-Cyr Coëtquidan & Régiment de Marche du Tchad*.