Tom Dupré la Tour

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Google Scholar

Highlights

- **Research scientist:** computational neuroscience, machine learning, signal processing, publications to machine learning conferences (NeurIPS, ICASSP) and neuroscience journals
- **Open-source developer:** scikit-learn core developer, large codebases, advanced numerical optimization, API design, library maintenance, code reviews
- **Data scientist:** data analysis, data visualization, mathematical modeling, large datasets

Experience

2019 – present (4 years) **Postdoc researcher**, *UC Berkeley*, Berkeley, CA, USA
- Advisor: Jack Gallant
- Deep-learning-based brain encoding models in vision and natural language
- Efficient hyper-parameter search on GPU for large multi-target models
- Taxonomy of V4 neurons modeled with a custom deep-learning model architecture
- Quantification of individual differences in encoding models using optimal transport

2015 – present (8 years) **Open-source developer**, *Scikit-learn*
- Development of scikit-learn, the most popular machine learning library in Python
- *"Fastest promotion ever to the core developer team." (Gaël Varoquaux)*

2016 – 2017 (1 year) **Teaching assistant**, *Télécom Paris*, Paris, France
- Practical data science, linear time-series, advisor for a year-long team project

2014 – 2014 (6 months) **Research intern**, *DxO Labs*, Boulogne-Billancourt, France
- Research on blind deconvolution for motion deblurring in computer vision
- *Dissertation highlighted for years as exemplary by Pierre Vandergheynst (ÉPFL)*

2013 – 2013 (3 months) **Research intern**, *Institut d'Électronique Fondamentale*, Orsay, France
- Research on a calculus paradigm using stochastic binary signals
- *Summa cum laude (top 10% dissertation) (École polytechnique)*

Education

2015 – 2018 (3.5 years) **Ph.D in computational neuroscience**, *Télécom Paris*, Paris, France
- Advisors: Alexandre Gramfort and Yves Grenier
- Thesis: "Non-linear models for neurophysiological time-series"
- *Best paper award - 1st prize (Université Paris-Saclay)*
- *Ph.D thesis award - 1st prize (Club EEA, GRETSI, GdR ISIS)*
- *"This is technically the most advanced PhD thesis I have ever seen, and the second best doesn't even come close to it." (Guido Nolte – dissertation reviewer)*

2013 – 2015 **M.Sc in EECS**, *ÉPFL*, Lausanne, Switzerland

2010 – 2013 **B.Sc in EECS**, *École polytechnique (X10)*, Palaiseau, France

2008 – 2010 **Preparatory school**, *Lycée Saint Louis*, Paris, France

Expertise

(9 years) **Software development:** Python, Cython, Git, Bash, Matlab, Javascript

Data science: Scikit-learn, Pytorch, Scipy, Matplotlib, Pandas

Skills: analysis, formalization, abstraction, fast learning, critical thinking, attention to details, clarity of thoughts, writing, automony, mentoring

Publications

in preparation M. Oliver*, M. Winter*, **T. Dupré la Tour***, M. Eickenberg*, J. L. Gallant, *A hierarchical convolutional energy model reveals how V4 neurons encode spatial, chromatic and temporal information in naturalistic videos*

in preparation M. Visconti di Oleggio Castello*, **T. Dupré la Tour***, A. O. Nunez-Elizalde, J. L. Gallant, *Quantitative description of individual differences in voxelwise encoding models*

in preparation **T. Dupré la Tour**, M. Visconti di Oleggio Castello, J. L. Gallant, *Voxelwise modeling tutorials: an encoding model approach to functional MRI analysis*

in preparation M. Visconti di Oleggio Castello*, F. Deniz*, **T. Dupré la Tour**, J. L. Gallant, *Voxelwise encoding models in functional MRI: the voxelwise modeling framework*

in preparation E. X. Meschke*, M. Visconti di Oleggio Castello*, **T. Dupré la Tour**, J. L. Gallant, *Model connectivity: leveraging the power of voxelwise modeling to recover functional networks*

in preparation V. Chauhan, R. Philip, M. Visconti di Oleggio Castello, G. Jiahui, M. Feilong, **T. Dupré la Tour**, J. Haxby, M.I. Gobbini, *Dynamic, naturalistic faces embedded in a narrative elicit responses in the distributed face processing system*

in revision F. Deniz*, C. Tseng*, L. Wehbe, **T. Dupré la Tour**, J. L. Gallant, *Semantic representations during language comprehension are affected by context*

preprint C. Chen, **T. Dupré la Tour**, J. L. Gallant, D. Klein, F. Deniz, *The cortical representation of language timescales is shared between reading and listening*

2022 **T. Dupré la Tour**, M. Eickenberg, A. O. Nuñez-Elizalde, J. L. Gallant, *Feature-space selection with banded ridge regression*, NeuroImage

2022 T. Moreau, M. Massias, A. Gramfort, ..., **T. Dupré la Tour**, ..., *Benchopt: Reproducible, efficient and collaborative optimization benchmarks*, NeurIPS

2022 A. O. Nuñez-Elizalde, F. Deniz, **T. Dupré la Tour**, M. Visconti di Oleggio Castello, J. L. Gallant, *Pymoten: scientific python package for computing motion energy features from video*, Zenodo

2021 **T. Dupré la Tour**, M. Lu, M. Eickenberg, J. L. Gallant, *A finer mapping of convolutional neural network layers to the visual cortex*, SVRHM workshop at NeurIPS

2019 L. Grabot, T. W. Kononowicz, **T. Dupré la Tour**, A. Gramfort, V. Doyère, V. van Wassenhove, *The strength of alpha-beta oscillatory coupling predicts motor timing precision*, Journal of Neuroscience

2018 **T. Dupré la Tour***, T. Moreau*, M. Jas, A. Gramfort, *Multivariate convolutional sparse coding for electromagnetic brain signals*, NeurIPS

2018 **T. Dupré la Tour**, Y. Grenier, A. Gramfort, *Driver estimation in non-linear autoregressive models*, ICASSP

2017 **T. Dupré la Tour**, L. Tallot, L. Grabot, V. Doyère, V. van Wassenhove, Y. Grenier, A. Gramfort, *Non-linear autoregressive models for cross-frequency coupling in neural time-series*, PLOS Computational biology

2017 M. Jas*, **T. Dupré la Tour***, U. Simsekli, A. Gramfort, *Learning the morphology of brain signals using alpha-stable convolutional sparse coding*, NeurIPS

2017 **T. Dupré la Tour**, Y. Grenier, A. Gramfort, *Parametric estimation of spectrum driven by an exogenous signal*, ICASSP

2017 **T. Dupré la Tour**, Y. Grenier, A. Gramfort, *Parametric models of phase-amplitude coupling in neural time-series*, BASP workshop

Services

2019 – 2022 **Reviewer**

- Reviews for machine learning conferences (NeurIPS/ICML/ICLR), open-source software journals (JMLR/JOSS/Scipy), and scientific journals (NeuroImage, GigaScience).
- *Reviewer award - Free registration for NeurIPS 2019.*

Nov. 2019 **Advisor**, *Women in machine learning and data science*, San Francisco, USA
Advisor for new contributors to scikit-learn.

Invited talks

Apr. 2021 Noninvasive Mathematics, *Convolutional sparse coding for electromagnetic brain signals*, Genoa, Italy (remote)

Mar. 2021 ENS seminar, *Multi-penalty ridge regression for voxelwise encoding models*, Lyon, France (remote)

Mar. 2021 Cognitive Neuroscience Colloquium, *Voxelwise encoding models*, Berkeley, USA (remote)

Aug. 2019 GRETSI, *Non-linear models for neurophysiological time-serie*, Lille, France (remote)

Nov. 2018 PyParis, *Scikit-learn Transformers, v0.20 and beyond*, Paris, France

Jun. 2018 PyData meetup, *Nearest neighbors in scikit-learn estimators, API challenges*, Paris, France

Sep. 2017 C3S, *Non-linear autoregressive models for cross-frequency coupling in neural time-series*, Cologne, Germany

Jun. 2016 PyData Paris, *Training with open-source*, Paris, France