Emilien Dupont

https://emiliendupont.github.io

Education

- **University of Oxford** — Oxford, UK
  PhD Machine Learning — *Oct 2018 - Oct 2022*
  - Supervised by Yee Whye Teh & Arnaud Doucet
  - Research interests: generative models, neural fields, neural rendering, neural ODEs and flows, neural compression
- **Stanford University** — Stanford, CA
  MS Computational and Mathematical Engineering — *Sept 2014 - Mar 2016*
  - GPA: 4.02
- **Imperial College London** — London, UK
  BSc Theoretical Physics — *Oct 2010 - Jun 2014*
  - Rank: 1/206 students, Grade: 87.2%

Experience

- **Google DeepMind** — London, UK
  Research Scientist — *Jan 2023 -*
  - Research on neural fields and machine learning for science
- **Google DeepMind** — London, UK
  Research Scientist Intern — *Mar 2021 - July 2021*
  - Research with Danilo Rezende on generative models of neural networks with applications to computer vision
- **Apple** — Oxford, UK
  Part Time Research Intern — *Nov 2019 - June 2020*
  - Part time research on neural rendering during PhD with collaborators at Apple
- **Apple** — Seattle, WA
  Research Intern — *June 2019 - Aug 2019*
  - Research with Qi Shan on equivariant neural rendering
- **Schlumberger STIC** — Menlo Park, CA
  Machine Learning Scientist — *June 2016 - July 2018*
  - Created, implemented and deployed machine learning algorithms to solve problems in time series, vision and geology, improving state of the art for several tasks
  - Research on deep generative models with a focus on learning interpretable representations
- **Gurobi Optimization** — Palo Alto, CA
  Software Engineering Intern — *June 2015 - Aug 2015*
  - Researched, formulated and solved integer optimization models for a wide area of industry applications including energy, telecom and medicine
- **DTU Compute** — Lyngby, Denmark
  Research Intern — *June 2013 - Sep 2013*
  - Research with Allan Engsig-Karup on sparse dynamics for PDEs

Publications

[1] *B. Romera-Paredes*, M. Barekatain*, A. Novikov*, M. Balog*, P. Kumar*,* ***E. Dupont****, F. Ruiz*, J. Ellenberg, P. Wang, O. Fawzi, P. Kohli, A. Fawzi**, Mathematical discoveries from program search with large language models, *Nature*

[2] *H. Kim*, M. Bauer*, L. Theis, J. Schwarz,* ***E. Dupont****, C3: High-performance and low-complexity neural compression from a single image or video

[3] *J. Xu,* ***E. Dupont****, K. Martens, T. Rainforth, Y. W. Teh*, Deep Stochastic Processes via Functional Markov Transition Operators, *NeurIPS 2023*

[4] *M. Bauer*,* ***E. Dupont****, A. Brock, D. Rosenbaum, J. Schwarz, H. Kim**, Spatial Functa: Scaling Functa to ImageNet Classification and Generation, *ICLR 2023 Neural Fields Workshop*

[5] ***E. Dupont***, Neural Networks as Data, *Thesis*

[6] ***E. Dupont*****, H. Loya*, M. Alizadeh, A. Golinski, Y. W. Teh, A. Doucet*, COIN++: Neural Compression Across Modalities, *TMLR 2022*

[7] ***E. Dupont*****, H. Kim*, A. Eslami, D. Rezende, D. Rosenbaum*, From data to functa: Your data point is a function and you can treat it like one, *ICML 2022*

[8] ***E. Dupont*****, A. Golinski*, M. Alizadeh, Y. W. Teh, A. Doucet*, COIN: COmpression with Implicit Neural representations, *ICLR 2021 Neural Compression Workshop* ***Spotlight***

[9] ***E. Dupont****, Y. W. Teh, A. Doucet*, Generative Models as Distributions of Functions, *AISTATS 2022* ***Oral***

[10] *M. Hutchinson*, C. Le Lan*, S. Zaidi*,* ***E. Dupont****, Y. W. Teh, H. Kim*, LieTransformer: Equivariant self-attention for Lie Groups, *ICML 2021*

[11] ***E. Dupont****, M. A. Bautista, A. Colburn, A. Sankar, C. Guestrin, J. Susskind, Q. Shan*, Equivariant Neural Rendering, *ICML 2020*

[12] ***E. Dupont****, A. Doucet, Y. W. Teh*, Augmented Neural ODEs, *NeurIPS 2019*

[13] ***E. Dupont****, S. Suresha*, Probabilistic Semantic Inpainting with Pixel Constrained CNNs, *AISTATS 2019*

[14] ***E. Dupont***, Learning Disentangled Joint Continuous and Discrete Representations, *NeurIPS 2018*

[15] ***E. Dupont****, T. Zhang, P. Tilke, L. Liang, W. Bailey*, Generating Realistic Geology Conditioned on Physical Measurements with GANs, *ICML 2018 TADGM Workshop*

Awards

- Google DeepMind Scholarship 2018
  PhD funding, 150,000 USD
- Schlumberger Out of the Ordinary Award 2018
  Award for extraordinary technical achievements
- Digital Forum Innovation Award 2017
  Schlumberger award for most innovative project among 300+ submissions
- Schlumberger AI Leader 2016
  Elected as leader of the 1000+ AI community within Schlumberger
- Governor's Prize 2014
  Ranked 1st of 206 students in Physics at Imperial College London

Teaching

- Teaching Assistant, SB2.1, Statistical Inference Oxford, 2020
- Teaching Assistant, SB2.2, Statistical Machine Learning Oxford, 2019

- Teaching Assistant, CME 102, Ordinary Differential Equations Stanford, 2016

Skills

- Programming
  - *Experienced*: Python
  - *Familiar*: C++, Matlab, JavaScript, Scala (Spark)
- Frameworks
  - *Deep Learning*: Pytorch, Jax, Haiku, Keras
  - *Visualization*: d3, plotly
- Languages
  - *Fluent*: Danish, English, French
  - *Intermediate*: German

Projects

- **Visualizations**
  Created d3 based **interactive visualizations** of mathematical concepts, data and generative art
- **Open source paper implementations**
  Open sourced code for several deep learning papers with ★1000+ on **Github**

Academic Services

- Co-organizer of the ICLR 2023 Workshop *Neural Fields across Fields: Methods and Applications of Implicit Neural Representations*
- Reviewer: ICLR 2023, AISTATS 2022, ICLR 2022, ICLR 2021 *(Outstanding reviewer award)*, NeurIPS 2020 *(Outstanding reviewer award)*, ICML 2020 *(Top reviewer award)*, NeurIPS 2019 *(Top reviewer award)*

Invited Talks

- Compression with neural fields 2023
  VQEG
- The Curse of Discretization and Learning Distributions of Functions 2021
  ML Collective
- Representational Limitations of Invertible Models 2020
  ICML 2020, INNF+ Workshop
- Combining Physics and Machine Learning with Neural ODEs 2019
  Abingdon, UK
- Deep Learning for Prognostics and Health Management Tutorial 2017
  Prognostics and Health Management Conference, Tampa Bay, FL
- Deep Learning Applications Panel 2017
  Prognostics and Health Management Conference, Tampa Bay, FL

Links

– **emiliendupont**.github.io
– github.com/**EmilienDupont**
– observablehq.com/**@emiliendupont**
– twitter.com/**emidup**
– linkedin.com/in/**emiliendupont**
– scholar.google.com/citations?user=**IY5WyIEAAAAJ**