CHANGQING FU

75016 Paris, France ⋄ changqingfu@changqingfu.com ⋄ +33 6 37 43 57 81

SUMMARY

Machine Learning researcher specialized in efficient generative models. Experienced with distributed TPU/GPU pipelines, developed and deployed large-scale SQL services serving 30M+ users/agents. Seeking research and engineering positions in generative AI.

TECHNICAL SKILLS

Programming: Python, C/C++, R, Julia, Lean, MATLAB, Bash, SQL, JavaScript, Linux, Git
Frameworks: PyTorch, JAX, Pandas, Tensorflow, TVM, Transformers/Diffusers, CUDA, ONNX

SELECTED RESEARCH

Transformers as Effective Fields: First-Principled derivation of the Transformer architecture from Quantum Physics.

Conic Linear Units (CoLU) (2024): Conic activation families from equivariance principles as drop-in replacements that outperforms ReLU/SiLU on standard vision/language benchmarks. NeurIPS UniReps (PMLR) and VISAPP 2024.

DeepPrism (2023): Channel-equivariant generative backbones across CNN/VAE/diffusion achieving up to 1000× parameter reduction; VSIP 2023 Best Presentation.

Tip of the Iceberg (2022): Symmetry-aware perceptual objectives achieving up to 10× faster diffusion model pre-training.

Sketch-Based Image Manipulation (2021): GANs with test-time training for localized edits that handles distribution shift. SSVM 2021.

EXPERIENCE

Paris Dauphine University — PSL / PRAIRIE 2019 – 2025
PhD Researcher (Applied Mathematics) *Paris, France*

- Led symmetry-aware model architecture research, translating theory into performant systems; achieved improvements over state-of-the-art activation functions, up to 10× faster pre-training, and 1000× parameter savings in Transformers (JAX/PyTorch).
- Built research platform components: reproducible experiment frameworks, simulation and evaluation harnesses, automated feature generation, and large-scale job management across multi-host clusters.

Google TPU Research Cloud (TRC) 2023 – 2024
Program Fellow *Remote*

- Operated large TPU allocations; standardized multi-host configurations (v2/v3/v4 pods) to reduce training lifecycle from ∼48h to ∼3h via parallel compilation, scheduling, and memory/IO optimizations. Migrated between JAX and PyTorch codebases without performance loss.

Ping An Insurance May 2018 – Sep 2018
Machine Learning Engineer — Recommendation Systems *Shanghai, China*

- Shipped an agent-recommendation service end-to-end, serving 30M+ users/agents; improved profitability by up to 20%.
- Productionized distributed user-profile models with automated drift monitoring and executive dashboards; reduced manual analysis workload for Business Intelligence team.

Other Engineering Experience 2013 – 2017
Machine Learning Engineer *Shanghai, China*

- **Central China Securities:** Financial Engineering in event-driven ANOVA pipelines for M&A screening with real-time financial data APIs (MATLAB).
- **East China State Grid:** 24-hour short-term load forecasting with SVM (R language).

· **Safor Intelligence (Startup Program):** Real-time flame detection (Naive Bayes + Markov) on factory video streams; deployed on production cameras (C++).

PUBLICATIONS & SERVICE

· **Reviewing**: CVPR, ICCV, ECCV, AISTATS, AAAI, ICLR, NeurIPS, and related workshops.
· **Fellowships & grants**: Google TRC Program Fellow (TPU allocation) and national Jean-Zay GPU grants for large-scale multimodal research.
· **Architecture theory**: EeurIPS Workshop 2025. C. Fu. "*Transformers Are Optimal Effective Fields*".
· **Generative model design**: NeurIPS UniReps Workshop, PMLR 2024. C. Fu and L. D. Cohen. "*Conic Activation Functions*"; VISAPP 2024. C. Fu and L. D. Cohen. "*Conic Linear Units: Seamless Model Fusion and Rotational Symmetric Generative Models*".
· **Lightweight generative modeling**: ACM VSIP 2023 Best Presentation. C. Fu and L. D. Cohen. "*DeepPrism: Channel Convolution for Lightweight Generative Model*".
· **Image manipulation**: SSVM 2021. C. Fu and L. D. Cohen. "*Geometric Deformation on Objects: Unsupervised Image Manipulation via Conjugation*".
· **Hackathon**: Winner, Augment AI @ EthCC (Station F, Paris). "*WebGPU Implementation of Zero-Knowledge Proofs*"; invited to Stability AI research program at CogX 2023 (London, UK).
· **Selected Talks**:
AI+Science Summer School, UChicago Paris, July 2025
Workshop on Optimal Transport, Mean Field Game and Machine Learning, NYU Paris, June 2025
Workshop on Geometry-Informed Machine Learning, UPMC, May 2025
Symposium on AI in Biology and Health, Institut Pasteur, July 2023
Ellis Unconference, Session of Generative Models, HEC Paris, July 2023
Workshop on Optimization and Machine Learning, Toulouse, June 2023
Artificial Intelligence Interdisciplinary Institutes (3IA) Workshop, Toulouse, Nov 2021
Applied Mathematics Seminar, Fudan University, Sep 2021

EDUCATION

Paris Dauphine University - PSL / Paris AI Research Institute (PRAIRIE) 2019 – 2025
Ph.D. in Applied Mathematics *Paris, France*
· Dissertation: "Geometry in Generative Models". Advisor: Laurent D. Cohen

Paris Diderot University / Paris Dauphine University - PSL 2017 – 2018
M.Sc. in Applied Mathematics *Paris, France*
· Theses: "Numerical Methods for the 2D Wave Equation" / "Bayesian Learning for Fluid Mechanics"

School of Mathematical Sciences, Fudan University 2013 – 2017
B.Sc. in Mathematics; Second Major in Data Science *Shanghai, China*
· Undergraduate Thesis: "Kernel Methods for Metric Learning".

Hebrew University of Jerusalem 2015
Non-Degree. International Summer Program in Economics Education *Jerusalem, Israel*

University of Cambridge 2014
Non-Degree. Judge Business School *Cambridge, UK*

Harvard University 2013
Non-Degree. Harvard Association for US-China Relations (HAUSCR) *Boston, USA*

OTHER

Languages: Chinese (native), English (fluent), French (fluent).
Leadership: President of the Math Department; University Student Senator; Student Union VP; Chinese Orchestra Club leader.
Interests: Long-distance running, basketball, piano, bamboo flute.