Xiaoyu Lin

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PROFESSIONAL EXPERIENCE

Tsinghua University – Postdoctoral researcher — Beijing, China Feb. 2025–present

- Causal machine learning and out-of-distribution generalization.

Inria Grenoble-Rhône-Alpes – Postdoctoral researcher — Grenoble, France Aug. 2024–Jan. 2025

- Causal machine learning and their applications on sequential data.

EDUCATION

Inria Grenoble-Rhône-Alpes, RobotLearn Team — Grenoble, France
Ph.D. in Machine Learning, Supervisor: Xavier Alameda-Pineda, Laurent Girin — 01/11/2020–25/06/2024
Research topic: Deep Latent-Variable Generative Models for Multimedia Processing

École Centrale de Pékin, Beihang University — Beijing, China
M.S. in System Engineering, GPA: 3.75/4.00 — 01/09/2018–01/06/2020
Master Thesis: Cloud Computing Center Workloads Simulation Based on Time Series Generation

École CentraleSupélec (Cursus Centrale) — Paris, France
Engineer's degree, GPA: 3.60/4.00 — 01/09/2016–01/06/2018

École Centrale de Pékin, Beihang University — Beijing, China
B.S. in Information and Computer Science, GPA: 3.90/4.00 — 01/09/2013–01/06/2016

INDUSTRIAL EXPERIENCE

EM Data – Machine Learning Research Intern — Shanghai, China, Jul. 2020–Oct. 2020

- Precipitation nowcasting radar map sequences prediction with deep generative models such as GAN.

Walnut Algorithm – Machine Learning Research Intern — Paris, France, May 2019–Nov. 2019

- Statistical studies of Limit Order Book data, building trading strategies with statistical and machine learning algorithms.

Schlumberger – Artificial Intelligence Research Intern — Beijing, China, Jul. 2018–Oct. 2018

- Application of time-series clustering, classification and statistical prediction algorithms on large-scale time-series data for unsupervised drill bit speed pattern recognition and prediction.

Schlumberger – Software Engineer Intern — Beijing, China, Jul. 2017–Sep. 2017

- Software algorithm analysis, fluid mechanic problem analysis using Bernoulli Equation.

PUBLICATIONS AND SOFTWARES

1. X. Lin "Deep latent-variable generative models for multimedia processing", in *Université Grenoble Alpes*, 2024.

   Scientific significance: This PhD thesis addresses the challenging task of applying deep probabilistic generative models to solve intricate scientific and engineering problems within unsupervised or weakly supervised learning frameworks. This research not only contribute to the theoretical understanding of the deep generative models, but also demonstrate their practical applicability across various domains, laying the groundwork for future innovations in machine learning.

2. X. Lin, L. Girin, and X. Alameda-Pineda, "Mixture of dynamical variational autoencoders for multi-source trajectory modeling and separation", in *Transactions on Machine Learning Research (TMLR)*, 2023.

   Scientific significance: This paper introduces a novel weakly supervised method for separating trajectories from multiple sources, leveraging deep probabilistic generative models and variational inference. The versatility of the proposed model extends its applicability across various scientific and engineering domains.

   Software: MixDVAE

3. X. Lin, X. Bie, S. Leglaive, L. Girin, and X. Alameda-Pineda, "Speech modeling with a hierarchical transformer dynamical vae", in *2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Rhodes, Greece, 2023, pp. 1–5.

   Scientific significance: This paper investigates an innovative deep probabilistic generative model that merges Transformer architecture with sequential probabilistic models, enhancing the analysis of sequential data, particularly in the domain of speech signals.

   Software: LigHT-DVAE

4. X. Lin, S. Leglaive, L. Girin, and X. Alameda-Pineda, "Unsupervised speech enhancement with deep dynamical generative speech and noise models", in *Interspeech*, Dublin, Ireland, 2023.

   Scientific significance: This paper explores a novel scalable unsupervised speech enhancement method utilizing deep probabilistic generative models, offering valuable insights into both the potential and challenges inherent in employing such models to address problems under distribution shift settings.

   Software: DDGM-SE

5. X. Lin, "Unsupervised multi-object tracking via dynamical vae and variational inference", in *The Doctoral Symposium of the 30th ACM International Conference on Multimedia*, Lisboa, Portugal, 2022, pp. 6910–6914.

TEACHING

- **Teaching Assistant** at University Grenoble Alpes (30h)   Fall semester 2021
  Analyse élémentaire & *Introduction au calcul scientifique (MAP101)*

PROFESSIONAL SERVICES

Conference Reviewer: ACM MM (2021-2024), IEEE ICASSP 2024, IEEE ICRA 2024

INVITED PRESENTATIONS

- **Deep Probabilistic Generative Models for Audio/Visual Tasks**, LTCI, Télécom Paris, Institut polytechnique de Paris, Nov. 2023. slides

- **Dynamical Variational Auto-encoder – from Theory to Application**, joint talk with Xiaoyu Bie, SKL, Nanjing University, Oct. 2023. slides

PROFESSIONAL FORMATIONS

- **Machine Learning Summer School**   Okinawa, 2024
  Lectures on various topics which are at the core of modern Machine Learning, from fundamentals to state-of-the-art practice.
- **PRAIRIE / MIAI Aritificial Intelligence Summer School**   Online, 2021
  Lectures conducted by renowned experts in different areas of artificial intelligence, including computer vision, machine learning, natural language processing, robotics, and healthcare.

SCHOLARSHIPS AND AWARDS

- Travel support for the Machine Learning Summer School in Okinawa, Japan ($\sim$ 650\$)   2024
- Travel grant for the 30th ACM International Conference on Multimedia in Lisboa, Portugal (1000\$)   2022

- First class scholarship for studies of Beihang University   2016
- China national aero-technology corporation scholarship   2015
- China national scholarship   2014

Supervision and Mentorship

Co-supervision/collaboration: Master thesis of Ghazi Shazan Ahmad on Deep Statistical Manifold Learning.