Pascal Jutras-Dubé

pjutrasd@purdue.edu

Google Scholar | GitHub | Website

+1 765-337-9282

Summary

PhD student in Computer Science at Purdue University, advised by Ruqi Zhang, working on fast, scalable generative modeling and probabilistic inference. Current interests include diffusion large language models (dLLMs): theoretical foundations, parallel decoding, test-time alignment, and multimodality.

Education

PhD	Computer Science	Purdue University	2023 – Present	GPA 3.95/4
MSc	Computer Science	University of Montreal	2020 – 2022	GPA 4.3/4.3
BSc	Mathematics and Computer Science	University of Montreal	2017 – 2020	

Work Experience

- **Research Assistant / Teaching Assistant** *Jan 2023 - Present*
  Purdue University
  - Sticky Jump Diffusion:
    * Formalized Sticky Jump Diffusions as a single continuous-time Markov process that captures a wide class of hybrid discrete/continuous diffusion models for discrete or multi-modal generation (images, text, molecules).
    * Formally derived the exact reverse-time generator and introduced Denoising Hazard Matching (DHM) as a learning objective.
  - One-Step Diffusion Samplers:
    * Proposed One-Step Diffusion Samplers (OSDS), which learn a step-conditioned ODE via state and volume consistency, and derived a deterministic-flow importance weight for fast evidence estimation.
    * OSDS is the first sampler that achieves both high-quality sample generation and accurate statistical estimation in one-step; which is less then 1% of the compute of previous diffusion samplers.
  - Uncertainty-Based Adaptive Planning:
    * Developed uncertainty-based adaptive planning diffusion policies for collision avoidance and faster path execution.
    * Reduced planning frequency to only about 10% of the steps without compromising performance.
  - Teaching: PhD-level Statistical Machine Learning (CS578): wrote and graded assignments/exams, held office hours, and delivered lectures on diffusion models.

- **Research Intern** *Jun 2021 - Nov 2022*
  National Bank of Canada
  - Designed an attacker-centric scoring framework (linkability + information gain) of privacy-preserving data release strategies (data minimization, anonymization, and synthesis) and mapped privacy–utility Pareto frontiers

- **Research Intern** *May 2020 - Jan 2021*
  IPtoki (startup)
  - Built a time-series forecasting gait-recognition proof of concept from smartphone inertial sensors.

- **Software Engineer Intern** *May 2019 - Aug 2019*
  GRAITEC
  - Full-stack development for a production CAD application for woodwork workflows; shipped features and fixes in a team environment.

Publications

- **Jutras-Dubé, P.**, Zhang, J., Wang, Z., & Zhang, R. (2026). *One-Step Diffusion Samplers via Self-Distillation and Deterministic Flow.* International Conference on Artificial Intelligence and Statistics (AISTATS)

- Punyamoorty, P.*, **Jutras-Dubé, P.***, Zhang, R., Aggarwal, V., Conover, D., & Bera, A. (2025). *Dynamic Obstacle Avoidance through Uncertainty-Based Adaptive Planning with Diffusion.* International Conference on Intelligent Robots and Systems (IROS).

- **Jutras-Dubé, P.**, Pynadath, P., & Zhang, R. (2025). *Single-Step Consistent Diffusion Samplers.* Frontiers in Probabilistic Inference Workshop at ICLR.

- Mesana, P., **Jutras-Dubé, P.**, Crowe, J., Vial, G., & Caporossi, G., Gambs, S. (2025). *Measuring privacy/utility tradeoffs of format-preserving strategies for data release.* Journal of Business Analytics.

- **Jutras-Dubé, P.**, Al-Khasawneh, M. B., Yang, Z., Bas, J., Bastin, F., & Cirillo, C. (2024). *Copula-based transferable models for synthetic population generation.* Transportation Research Part C.

- **Jutras-Dubé, P.**, Zhang, R., & Bera, A. (2024). *Adaptive planning with generative models under uncertainty.* International Conference on Intelligent Robots and Systems (IROS).

- Mesana, P., **Jutras-Dubé, P.**, Crowe, J., Vial, G., & Caporossi, G. (2024). *Evaluating the risk of re-identification in data release strategies: An attacker-centric approach.* Hawaii International Conference on System Sciences (HICSS).

SKILLS

- **Generative Modeling & Inference**: Diffusion models; discrete data generation; probabilistic inference; stochastic processes; importance sampling; evidence & likelihood estimation; planning and decision making
- **Programming**: Python
- **Frameworks**: JAX (Flax/Optax), PyTorch
- **Engineering**: Linux, Git, Hydra, Weights & Biases

ADDITIONAL INFORMATION

- **Posters & Orals**: MMLS 2025 (Oral, top 8%), FPI-ICLR 2025, IROS 2024, SAE 2022 (Oral), HEC Optimization Days 2022 (Oral)
- **Professional Service**: Reviewer for AISTATS 2026; ICLR 2025–2026; ICRA 2025; RA-L 2025–2026
- **Languages**: French (native), English (proficient)
- **Almost Surely**: My fashion startup for the STEM community: almost-surely.com
- **Awards**: UdeM Graduate Studies Scholarship (2021); DIRO Excellence Scholarship (4×, 2020–2022); Fin-ML CREATE Graduate Scholarship (2020)