Mike Gartrell

Generative AI

github.com/cgartrel cgartrel.github.io linkedin.com/in/mikegartrell mike.gartrell@acm.org

Professional Experience

Independent Researcher | Paris, France Oct. 2023 – Present

Conducting research related to generative AI, with a focus on score-based diffusion models, natural language processing (NLP), large language models (LLMs), generative adversarial networks (GANs), determinantal models, probabilistic models, and Bayesian methods. Co-authoring publications and mentoring PhD students on these topics.

Generative AI highlights:

- Co-authored a paper on an approach for differentially-private gradient flows using the sliced Wasserstein distance (arXiv 2023, under review).
- Ongoing work on controllable LLM decoding using determinantal models and related approaches.

Criteo AI Lab | *Senior Researcher* | Paris, France Feb. 2017 – June 2023

Conducted research related to scalable machine learning models for sets and generative AI, with a focus on determinantal models, natural language processing (NLP), large language models (LLMs), score-based diffusion models, recommendation systems, and Bayesian methods. Co-authored publications, released open-source implementations, led internal projects, and mentored PhD students on these topics.

Generative AI highlights:

- Co-authored a paper on a generative particle-based framework for unifying GANs, diffusion models, and gradient flows (NeurIPS 2023).
- Co-authored a paper on a VAE-enhanced language model for data-to-text and text-to-data tasks (AISTATS 2023).
- Co-authored a paper on the generalization of prefix-based approaches for data-to-text generation using LLMs (TALN 2023).
- Collected Criteo datasets and developed code for fine-tuning and evaluating LLaMA LLMs for an internal customer service chatbot.
- Performed an experimental evaluation of the impact of classifier-free guidance, prompt structure, and inpainting in Stable Diffusion on the quality of generated ad banner images.

Microsoft Israel R&D Center | *Postdoctoral Researcher* | Herzliya, Israel July 2014 – Aug. 2016

Developed novel recommendation models based on determinantal point processes (DPPs), while conducting recommendation systems research.

Microsoft Research | *Research Intern* | Cambridge, UK July 2013 – Nov. 2013

Developed a Bayesian model for group recommendation, using one of the first large-scale TV group watching behavior datasets.

Microsoft Research | *Research Intern* | Cambridge, UK June 2011 – Aug. 2011

Developed a Bayesian recommendation system that leverages friendship connections in social networks to improve the predictive performance of the system.

Techoshark | *Co-founder & part-time contract Software Design Engineer* | Boulder, Colorado Feb. 2008 – May 2011

Developed Java EE (Enterprise Edition) server-side software to manage user accounts, provide for efficient location-based searches, and perform data/text mining of social network profiles.

Hewlett-Packard | *Software Design Engineer* | Corvallis, Oregon June 2000 – Feb. 2008

Developed various products and projects related to digital printing and publishing, including HP Instant Delivery, HP Asset Manager (part of HP Custom Publishing), and HP Production Flow. Through work on these projects gained extensive experience in designing, developing, documenting, and testing Java EE (Enterprise Edition) applications and components.

Education

University of Colorado Boulder Aug. 2014
PhD in Computer Science *Dissertation: Enhancing Recommender Systems Using Social Indicators*

University of Colorado Boulder Dec. 2008
MS in Computer Science *Thesis: Context-Aware Multimedia Presentation via Mobile Social Networks*

Virginia Tech May 2000
BS in Computer Engineering

Skills

Languages: Python, Julia, R, Java, C, C++, C#, LaTeX, HTML
Machine learning (ML) and data science frameworks: PyTorch, NumPy, R
Other ML/AI skills: deep learning, generative modeling, large language models (LLMs), Bayesian methods, probabilistic modeling, natural language processing (NLP), recommendation systems
Other software skills: Git, Hadoop

Selected Publications

See my Google Scholar profile for a list of all publications.

Generative AI: Diffusion Models and Gradient Flows

- Differentially Private Gradient Flow based on the Sliced Wasserstein Distance for Non-Parametric Generative Modeling *Sebag, Pydi, Franceschi, Rakotomamonjy, Gartrell, Atif, Allauzen* arXiv 2023
- Unifying GANs and Score-Based Diffusion as Generative Particle Models *Franceschi, Gartrell, Dos Santos, Issenhuth, de Bézenac, Chen, Rakotomamonjy* NeurIPS 2023

Generative AI: Large Language Models

- Evaluating the Generalization Property of Prefix-based Methods for Data-to-text Generation *Vongpaseut, Lumbreras, Gartrell, Gallinari* TALN 2023
- Learning from Multiple Sources for Data-to-Text and Text-to-Data *Duong, Lumbreras, Gartrell, Gallinari* AISTATS 2023

Subset Selection and Diversity Learning using Determinantal Point Processes (DPPs)

- Scalable MCMC Sampling for Nonsymmetric DPPs *Han, Gartrell, Dohmatob, Karbasi* long presentation ICML 2022
- Scalable Sampling for Nonsymmetric DPPs *Han, Gartrell, Gillenwater, Dohmatob, Karbasi* spotlight presentation ICLR 2022
- Scalable Learning and MAP Inference for Nonsymmetric DPPs *Gartrell, Han, Dohmatob, Gillenwater, Brunel* oral presentation ICLR 2021
- Learning Nonsymmetric DPPs *Gartrell, Brunel, Dohmatob, Krichene* NeurIPS 2019
- Learning DPPs by Corrective Negative Sampling *Mariet, Gartrell, Sra* AISTATS 2019
- Low-Rank Factorization of DPPs *Gartrell, Paquet, Koenigstein* AAAI 2017

Recommender Systems

- Combining Reward and Rank Signals for Slate Recommendation *Aouali, Ivanov, Gartrell, Rohde, Vasile, Zaytsev, Lgrand* Workshop on Bayesian Causal Inference for Real World Interactive Systems, KDD 2021
- Tensorized DPPs for Recommendation *Warlop, Mary, Gartrell* KDD 2019
- Bayesian Low-Rank DPPs *Gartrell, Paquet, Koenigstein* RecSys 2016
- A Large-scale Exploration of Group Viewing Patterns *Chaney, Gartrell, Hofman, Guiver, Koenigstein, Kohli, Paquet* honorable mention for best paper award TVX 2014
- Enhancing Group Recommendation by Incorporating Social Relationship Interactions *Gartrell, Xing, Lv, Breach, Han, Mishra, Seada* GROUP 2010

Mobile and Social Computing

- Supporting Healthy Grocery Shopping via Mobile Augmented Reality *Ahn, Williamson, Gartrell, Han, Lv, Mishra* ACM Transactions on Multimedia Computing, Communications, and Applications 2015
- AnchorMF: Towards Effective Event Context Identification *Gu, Gartrell, Lv, Grunwald* CIKM 2013
- Fusing Mobile, Sensor, and Social Data To Fully Enable Context-Aware Computing *Beach, Gartrell, Xing, Han, Lv, Mishra, Seada* HOTMOBILE 2010
- WhozThat? Evolving an Ecosystem for Context-Aware Mobile Social Networks *Beach, Gartrell, Akkala, Elston, Kelly, Nishimoto, Ray, Razgulin, Surendar, Terada, Han* IEEE Network 2008

Supervisory Experience

PhD Student Research

- Ongoing mentorship of Dalin Wang's research on controllable language model decoding using determinantal point processes (DPPs). Jan. 2023 - present
- Ongoing mentorship of Insu Han's PhD and postdoc research on scalable methods for DPPs. Feb. 2020 - present
- Co-supervised Ilana Sebag's PhD research on controllable generative models, score-based diffusion models, and gradient flows. Dec. 2022 - Dec. 2023
- Co-supervised Song Duong's PhD research on generative models for text and data-to-text/text-to-data. Feb. 2022 - June 2023
- Mentored Lucas Anquetil, and served as a member of his PhD committee. Feb. 2022 - June 2023

Criteo Research Internships

- Co-supervised Imad Aouali's internship on slate recommendation and multi-armed bandits. Apr. 2021 - Oct. 2021
- Supervised Lucas Anquetil's internship on Wasserstein-distance-based methods for learning models for discrete sets. Mar. 2020 - Sep. 2020
- Supervised Jason Zhang's internship on diversity in recommendation. May 2017 - Dec. 2017

Academic Research Experience

University of Colorado Boulder | *Research Assistant* Sep. 2011 – May 2014
Developed a framework for building mobile context-aware applications that leverage social networks, as a main focus of the SocialFusion project.

University of Colorado Boulder | *Research Assistant* Jan. 2007 – May 2009
Developed a wireless sensor network for environmental monitoring in a global warming project, while working in the MANTIS group. Collaborated with the National Center for Atmospheric Research (NCAR) and the Department of Ecology and Evolutionary Biology at the University.

Teaching Experience

University of Colorado Boulder | *Teaching Assistant* Jan. 2013 – May 2013, Jan. 2014 – May 2014
Teaching assistant for CSCI 3573: Operating Systems. Responsibilities included leading and teaching a recitation section, holding office hours, and grading.

Grants and Awards

NSF GK-12 Fellowship June 2010 – May 2011
Integrated aspects of computing and sensor technology into STEM curriculum at the middle school and elementary school level and taught this material within the Boulder Valley School District.

SBIR Phase I Grant Jan. 2009 – June 2009
Co-authored proposal for grant awarded to Techoshark on "Improving Business-Consumer Commerce via Mobile Social Networking Services".

Service

Hosted Workshops and Seminars

- Workshop on Bayesian Causal Inference for Real World Interactive Systems KDD 2021
- Laplace's Demon online seminar series on Bayesian machine learning at scale 2020 - 2021
- Workshop on Negative Dependence and Submodularity in Machine Learning ICML 2020
- Workshop on Negative Dependence in Machine Learning ICML 2019

Reviewer: NeurIPS, ICML, ICLR, AAAI