Ruizhi Deng

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Education

Aug. 2019– Present **Simon Fraser University**, *Burnaby, BC Canada*.
- Doctor of Philosophy in Computing Science.
- Advisor: Dr. Greg Mori

Sep. 2017– Aug. 2019 **Simon Fraser University**, *Burnaby, BC Canada*.
- Master of Science in Computing Science. *GPA:* 4.07/4.33
- Advisor: Dr. Greg Mori

Sep. 2013– Dec. 2016 **University of Michigan - Ann Arbor**, *Ann Arbor, MI USA*.
- Bachelor of Science in Mathematics, Minor in Computer Science. *GPA:* 3.85/4.0
- Graduated with High Distinction.
- Research Advidor: Dr. Honglak Lee.

Research Interest Statement

I'm interested in studying fundamental problems in machine learning through principled approaches. More specifically, my research is focused on the intersection of variational Bayes method, generative modeling, and their applications to time series data. I also have experience in adversarial machine learning and developing robust defense against adversarial attacks.

Publications

2021 **Continuous Latent Process Flows**
In Proceedings of NeurIPS 2021 [PDF] [Code]
Ruizhi Deng, Marcus Brubaker, Greg Mori, Andreas Lehrmann

2020 **Modeling Continuous Stochastic Processes with Dynamic Normalizing Flows**
In Proceedings of NeurIPS 2020; accepted to ICML 2020 INNF+ Workshop for oral presentation [PDF] [Code]
Ruizhi Deng, Bo Chang, Marcus Brubaker, Greg Mori, Andreas Lehrmann

2019 **Point Process Flows**
Accepted to NeurIPS 2019 Point Process Workshop [PDF]
Nazanin Mehrasa*, **Ruizhi Deng***, Mohamed Osama Ahmed, Bo Chang, Jiawei He,Thibaut Durand, Marcus Brubaker, Greg Mori
$*$ denotes equal contribution.

2019 **advIT: Adversarial Frames Identifier Based on Temporal Consistency In Videos**
In Proceedings of ICCV 2019 [PDF]
Chaowei Xiao, **Ruizhi Deng**, Bo Li, Taesung Lee, Benjamin Edwards, Jinfeng Yi, Dawn Song, Mingyan Liu, Ian Molloy

2018 **Characterize Adversarial Examples Based on Spatial Consistency Information for Semantic Segmentation**
In Proceedings of ECCV 2018 [PDF]
Chaowei Xiao, **Ruizhi Deng**, Bo Li, Fisher Yu, Mingyan Liu, Dawn Song

2018 **Sparsely Aggregated Convolutional Networks**
In Proceedings of ECCV 2018 [PDF] [Code]
Ligeng Zhu, **Ruizhi Deng**, Michael Maire, Zhiwei Deng, Greg Mori, Ping Tan

2018 **Adaptive Appearance Rendering**
In Proceedings of BMVC 2018 [PDF]
Mengyao Zhai, **Ruizhi Deng**, Jiacheng Chen, Lei Chen, Zhiwei Deng, Greg Mori

Preprints and Works under Review

2022 **Continuous-time Particle Filtering for Latent Stochastic Differential Equations**
Work under review [PDF coming soon]
Ruizhi Deng, Greg Mori, Andreas Lehrmann

2019 **Variational Hyper RNN for Sequence Modeling**
arXiv preprint [PDF]
Ruizhi Deng, Yanshuai Cao, Bo Chang, Leonid Sigal, Greg Mori, Marcus Brubaker

2017 **Learning to Forecast Videos of Human Activity with Multi-granularity Models and Adaptive Rendering**.
arXiv Prepreint [PDF]
Mengyao Zhai, Jiacheng Chen, **Ruizhi Deng**, Ligeng Zhu, Lei Chen, Greg Mori

Professional Experience

Aug. 2019– Present **Machine Learning Research Intern**, *Borealis AI*, Vancouver.
Supervised by Dr. Andreas Lehrmann.
- Proposed and studied continuous time-series models using normalizing flows and neural stochastic differential equations and their applications to irregularly-sampled time series data.
- Published papers at NeurIPS 2021, NeurIPS 2020 and ICML 2020 INNF+ Workshop based on works done during internship.

Feb. 2019– May 2019 **Machine Learning Research Intern**, *Borealis AI*, Toronto.
Supervised by Dr. Yanshuai Cao.
- Proposed and implemented an RNN with hypernetworks that is able to dynamically generate weights based on the context and current observation to model sequential data.
- Made a submission to NeurIPS 2019 based on work during internship.

Mar. 2017– May. 2017 **General Software Engineer Intern**, *TuSimple*, San Diego.
Supervised by Dr. Panqu Wang
- Studied stable video semantic segmentation with optical flow, car and pedestrian contour detection, and curb detection in 3D point cloud.

Feb. 2016– Dec. 2016 **Research Assistant**, *EECS Department, University of Michigan*, Ann Arbor.
Supervised by Dr. Honglak Lee.
- Studied interactive semantic segmentation using fully convolutional networks and wound segmentation on medical images with recurrent neural networks and fully connected conditional random fields.
- Contributed to the development of a mobile application for wound segmentation and area estimation using images taken by cell phones.

Academia Service

Conference Reviewer: ICLR 2021, INNF+ Workshop 2021, NeurIPS 2021, ICML 2022, NeurIPS 2022, ICLR 2023

Journal Reviewer: TMLR

Skills

Programming Languages: Python, MATLAB, C/C++, LaTeX, Markdown, Bash

Library and Tools: PyTorch, Tensorflow, OpenCV, scikit-learn, MxNet, Caffe

Honors and Awards

2019 -2021	Graduate Fellowship	Simon Fraser University
2017	Graduate Fellowship	Simon Fraser University
2015, 2017	James B. Angell Scholar	University of Michigan, Ann Arbor
2013 -2016	University Honors	University of Michigan, Ann Arbor