Xiao Ma

National University of Singapore
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Education

National University of Singapore (NUS), Singapore 2017 - Present
Doctor of Philosophy in Computer Science
Supervisor: Prof. David Hsu
Shanghai Jiao Tong University (SJTU), Shanghai 2013 - 2017
Bachelor of Science in Computer Science

Publications

Xiao Ma, Peter Karkus, David Hsu, Wee Sun Lee. "Particle Filter Recurrent Neural Networks", *arXiv preprint, arXiv:1905.12885*, 2019

Peter Karkus, **Xiao Ma**, David Hsu, Leslie Pack Kaelbling, Wee Sun Lee, Tomas Lozano-Perez. "Differentiable Algorithm Networks for Composable Robot Learning", *Robotics: Science and Systems (RSS)*, 2019 (**Best System & Student Paper** finalist)

Xiao Ma, Xiaofeng Gao, Guihai Chen. "BEEP: a Bayesian perspective Early state Event Prediction model for online social networks", *IEEE International Conference on Data Mining (ICDM)*, 2017

Xiao Ma, Zhenzhe Zheng, Fan Wu and Guihai Chen. "Trust-Based Time Series Data Model for Mobile Crowdsensing", *IEEE International Conference on Communications (ICC)*, 2017

Patents

Bin Sheng, **Xiao Ma**. "Segmentation of Abdominal Adipose Tissues via Deep Learning", CN106355574A, 2016

Research Projects

Particle Filter Reucurrent Neural Networks July 2018 - present
Supervised by Prof. David Hsu and Prof. Wee Sun Lee *AdaComp@NUS*
- Extend generic RNNs by maintaining a latent state distribution, approximated by a set of weighted particles
- Maintain the latent state distribution by a fully differentiable particle filter algorithm

Differentiable Algorithm Networks July 2018 - present
Supervised by Prof. David Hsu and Prof. Wee Sun Lee *AdaComp@NUS*
- Compose a robot system with neural network modules, each encoding a differentiable robot algorithm and an associated model, and optimize the policy by end-to-end learning
- Provide high data efficiency given the structural prior
- Leverage imperfections of algorithms and models between the components by end-to-end learning
- Nominated as the best system paper for RSS 2019

Early State Hot Event Prediction in Social Networks Nov. 2016 - Jun. 2017
Undergraduate Reseaerch Assistant, Supervised by Prof. Xiaofeng Gao *Advanced Network Lab@SJTU*
National Undergraduate Training Programs for Innovation and Entrepreneurship
- Designed two Semi-Naive Bayes Classifier based models, BEEP, SimBEEP, for early state event prediction whose performances outperform the state-of-the-art prediction models in the very early state.
- Paper published in *ICDM 2017*.

Time series modeling in Crowd Sensing Network Oct. 2014 - Dec. 2016
Undergraduate Research Assistant, Supervised by Prof. Fan Wu *Advanced Network Lab@SJTU*
- Quantified the users' reliability in Crowdsensing and modeled the Time Series Data with a Dyanmic Bayesian Network and proposed a corresponding EM algorithm to learn the parameters effectively and efficiently.
- Paper published in *ICC 2017*.

Work Experience

Software Engineer Intern at **Intel** Asia Pacific R & D Center May 2017 - Dec. 2017
- Optimize the Javascript compiler, V8 engine, of the Google Chrome browser
- Develop automatic testing framework, target and submit fixes to the patches, mainly about regular expressions

Awards

Academic Excellence Scholarship 2014
Honorable Mention of Mathematical Contest In Modeling 2015
Academic Excellence Scholarship 2016
Honorable Mention of Mathematical Contest In Modeling 2016
Excellent Project of the *National Undergraduate Training Programs for Innovation and Entrepreneurship* 2016
NUS Research Scholarship 2017
Second Prize in iNTUition Hachathon 2017