

# 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 (To appear; **best system paper** nominated)

**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 Recurrent 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 Research 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 Dynamic 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 Hackathon

2017