GUANGZHI TANG

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RESEARCH INTERESTS

Neurorobotics, Spiking Neural Networks, Neuromorphic Computing

RESEARCH EXPERIENCE

Rutgers University May 2016 - Present
Computational Brain Lab *Graduate Research Assistant*

- Developing a brain mimicking robotic navigation system. The system follows the same structure with the brain's spatial system inside and surrounding the hippocampal formation found by experimental studies. Only biologically constrained computational components are used to pursue a biologically plausible implementation.
- Developed a spiking neural network model to drive a mobile robot to move in a simulated double-T maze. The model gave assumptions on place cell's remapping activities and border cell's mapping functionalities. This was the first model for the brain's spatial system fully using spiking neurons and bio-constrained components to transfer and manipulate information from sensory inputs to motor control.
- Developed a spiking neural network model of head direction cells to correct the head direction representation from dead reckoning errors. The model used Bayesian inference to combine visual cues from border cells and self-motion cues from head direction cells to generate more accurate head direction representation. This was the first model for head direction cell cue integration using a Bayesian inference approach.

Nanjing University Sep 2013 - May 2015
Reasoning and Learning Research Group *Undergraduate Research Assistant*

- Developed an adaptive algorithm to play Texas Holdem poker with different type of players. The algorithm used online learning and sampling with game theory approach, and outperformed many other online methods in the field of imperfect information extensive games.

Baidu, Inc. Jul 2014 - Sep 2014
Search Ranking Team, Mobile Search Group *Research & Development Intern*

- Developed methods to find search query correlations in huge amounts of daily mobile search raw data using Hadoop cluster. Developed personalized search ranking recommendation algorithms for users with different searching habits.

EDUCATION

Rutgers University *New Brunswick, NJ*
Ph.D student, Computer Science Sep 2017 - Present
Research Affiliation: Computational Brain Lab, CBIM
Research Advisor: Prof. Konstantinos Michmizos

Rutgers University *New Brunswick, NJ*
M.Sc, Computer Science Sep 2015 - May 2017
Overall GPA: 3.87
Thesis Advisor: Prof. Konstantinos Michmizos
Thesis Title: Gridbot: Towards a Neuroinspired Navigation System for Robot Planning

Nanjing University *Nanjing, China*
B.Sc, Computer Science Sep 2011 - May 2015
Overall GPA: 3.1
National Talented Program of China

PUBLICATIONS

Peer-reviewed Publications

- **Tang G**, Michmizos K. *Gridbot: An autonomous robot controlled by a Spiking Neural Network mimicking the brain's navigational system.* International Conference on Neuromorphic Systems, Knoxville, TN, 2018.
- **Tang G**, Michmizos K. *Gridbot: A Spiking Neural Network Model of the Brain's Navigation System for Autonomous Robots.* Neuro Inspired Computational Elements Workshop, Portland, OR, 2018.
- **Tang G**, Michmizos K. *Gridbot: Spike-Based Head Direction Cells Employing Bayesian Inference.* Neuro Inspired Computational Elements Workshop, San Jose, CA, 2017.
- **Tang G**, Michmizos K. *NeuRobotics: A Spiking Neural Network Model of the Brain's Spatial Navigation System for Autonomous Robots.* Conference on Cognitive Computational Neuroscience, New York, NY, 2017.

Theses

- **Tang G.** *Gridbot: Towards a Neuroinspired Navigation System for Robot Planning.* Master's thesis, Rutgers University, New Brunswick, NJ, 2017.
- **Tang G.** *Fast Online Learning in Imperfect Information Extensive Games.* Bachelor's thesis, Nanjing University, Nanjing, China, 2015.

HONORS & AWARDS

Microsoft & IEEE Young Fellow Scholarship Award MSRA, 2014

Scholarship of the National Talented Program Chinese Ministry of Education, 2013, 2014

EXTRA CURRICULAR ACTIVITIES

Member, Rutgers University Cycling Team 2015-Present

Vice President, Nanjing University Cycling Association 2013-2015

Certification for First Aid and CPR 2016-Present