Yaqian ZHANG

CONTACT INFORMATION

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RESEARCH INTERESTS

Reinforcement Learning: Developing robust reinforcement learning algorithms to improve sample efficiency and build intelligent interactive systems.

Behavioral Data Analysis: Designing online/offline games and studying users' interactive characteristics using machine learning and data analysis.

EDUCATION BACKGROUNDS

Nanyang Technological University, Singapore (*Global Ranking 11^{th}*) Aug 2015 – Feb 2020
Ph.D. in Computer Science (GPA: 4.83/5)
Thesis: *Understanding and improving interactive systems design with machine learning*

Shanghai Jiao Tong University, China (*Global Ranking 60^{th}*) Sep 2011 – Jun 2015
B.Eng. in Information Engineering (GPA: 4.53/5)
Thesis: *SSIM-inspired rain removal with quaternion sparse representation*

PUBLICATIONS

Yaqian Zhang, Wooi-Boon Goh, Generalized bootstrapped policy optimization using better and worse action sets. *International Conference on Machine Learning* (ICML) 2020. (*Under review*)

Yaqian Zhang, Wooi-Boon Goh, Reinforcement learning-based adaptive task difficulty personalization. *User Modeling and User-Adapted Interaction*. (Impact factor = 3.4) (*Under review*)

Yaqian Zhang, Wooi-Boon Goh, Bootstrapped policy gradient for difficulty adaptation in intelligent tutoring systems. *In Proc. of the 18th International Conference on Autonomous Agents and Multiagent Systems* (AAMAS 2019 oral), Montreal, Canada, May 1317, 2019. (Acceptance rate = 24.2%)

Yaqian Zhang, Wooi-Boon Goh, The influence of peer accountability on attention during gameplay. *Computers in Human Behavior*, 84 (2018): 18-28. (Impact factor = 4.3)

Yaqian Zhang, Jacek Mańdziuk, Chai Hiok Quek, Wooi-Boon Goh, Curvature-based method for determining the number of clusters. *Information Sciences*, 415 (2017): 414-428. (Impact factor = 5.5)

Enmei Tu, **Yaqian Zhang**, Lin Zhu, Jie Yang, Nikola Kasabov, A graph-based semi-supervised k nearest-neighbor method for nonlinear manifold distributed data classification. *Information Sciences* 367-368 (2016): 673-688. (Impact factor = 5.5)

Enmei Tu, Jie Yang, Nikola Kasabov, **Yaqian Zhang**, Posterior Distribution Learning (PDL): A novel supervised learning framework using unlabeled samples to improve classification performance. *Neurocomputing* 157 (2015): 173-186. (Impact factor = 4.1)

RESEARCH PROJECTS

Sample efficient reinforcement learning Aug 2017 – Aug 2019
- Proposed to utilize action relationship to bootstrap policy gradient;
- Provided theoretical guarantee for unbiased convergence;
- Achieved efficient exploration of large action space with short horizon.

Reinforcement learning-based dynamic difficulty adaptation Aug 2017 – Aug 2019
- Designed and implemented an online visual memory game platform;
- Deployed & collected gameplay data via Amazon Mechanical Turk;
- Personalized memory training experience using reinforcement learning.

Curvature-based method for determining the number of clusters Aug 2015 – Aug 2017
- Proposed to exploit the curvature to determine the cluster number;
- Developed a new k-mean clustering algorithm with automatic k selection;
- Outperformed existing approaches in challenging datasets by 11%.

Cooperative and competitive gameplay design Aug 2015 – Aug 2017

- Designed and implemented a multi-player tablet game using Unity3D;
- Conducted a user study with 40 participants and performed data analysis;
- Identified the positive effect of strong peer accountability on user attention.

SSIM-inspired rain removal with quaternion sparse representation Mar 2014 – Jun 2015

- Proposed the definition of structural similarity (SSIM) index in quaternion domain;
- Devised SSIM-inspired quaternion sparse representation algorithm for rain removal;
- Improved rain removal performance by 3.6 dB in PSNR and 0.11 in SSIM.

COURSE PROJECTS

Development of a search engine for information retrieval Aug 2015 – May 2016

- Designed a searching engine on DBLP XML dataset using Lucene;
- Achieved a precision of 0.91 in binary assessment of similar publication search;
- Proposed a new similarity measurement based on the Jaccard coefficient.

Design a Leap Motion-based game using Unity3D Aug 2015 – Dec 2015

- Designed and developed a Leap Motion based game with Unity3D;
- Implemented the core algorithm of generating random Euler graph;
- Represented the team to pitch to industry experts.

AWARDS & HONORS

AAMAS Student Travel Award	2018 – 2019
NTU Research Scholarship	2015 – 2019
NTU MAGIC Game Design Challenge (3^{rd} prize Winner)	2015 – 2016
Pan Wen-Yuan Scholarship (top 3%)	2011 – 2012
SJTU Academic Excellence Scholarship	2011 – 2012
Merit Student Honor in Shanghai Jiao Tong University (top 3%)	2011 – 2012

PROGRAMMING SKILLS

Extensive experience with Python and TensorFlow
Intermediate experience with C/C++, Matlab, PyTorch
Familiar with AWS, SQL, Unity3D, PHP, JavaScript, HTML/CSS, Git

LANGUAGES

English (Professional Proficiency), Mandarin (Native Proficiency)

SERVICE

Reviewer 2016 – 2019
IJCAI 2020
Information Sciences
Science China Information Sciences
ICONIP 2019: International Conference on Neural Information Processing
IScIDE 2019: International Conference on Intelligence Science and Big Data Engineering

Teaching Assistant 2016 – 2018
CE/CZ3004 Multidisciplinary Design Project (MDP), NTU

Residential Mentor, Hall 15, NTU 2018 – 2019
Organized activities (Graphics Design workshops, HIIT training etc.) for residential education.

RESEARCH PRESENTATIONS

Bootstrapped policy gradient for difficulty adaptation in intelligent tutoring systems May 2019
AAMAS 2019, Montreal, Canada

MAGIC game design challenge pitch: leap-motion based game design Dec 2016
Multi-plAtform Game Innovation Centre (MAGIC), NTU