Guiliang Liu

POSTDOCTORAL FELLOW · COMPUTER SCIENCE
David R. Cheriton School of Computer Science, University of Waterloo, Waterloo, ON, Canada
| g233liu@uwaterloo.ca | guiliang.me/ | Guiliang | guiliang-liu-06b6b5a3

Education

University of Waterloo
Waterloo, Canada
POSTDOCTORAL FELLOW
Otc. 2020 - Otc. 2021

- **Supervisor:** Pascal Poupart
- **Research Interests:**
  - Multi-Modal Reinforcement Learning.
  - Natural Language Processing.

Simon Fraser University (SFU)
Burnaby, Canada
PHD OF COMPUTER SCIENCE
Sept. 2016 - Sept. 2020

- **Supervisor:** Oliver Schulte, **GPA**: 3.92/4.3
- **Research Interests:**
  - Interpretable Deep Reinforcement Learning for Action Values in Team Sports.
  - Spatio-Temporal Data Mining for Professional Sports Data.
  - Statistical Inference for Player Embedding.
- **Master Program Skipped:** Directly recruited as a PhD student after bachelor school.

South China University of Technology (SCUT)
Guangzhou, China
BACHELOR OF ENGINEERING
Sept. 2012 - July 2016

- **Major:** Computer Science and Technology, **GPA:** 3.72/4, **Rank:** 3/20
- Enrolled in the Taught-in-English elite student program.

Research Experience

University of Waterloo and Vector Institute
Waterloo, Canada
POSTDOCTORAL FELLOW
Otc. 2020 - Otc. 2021

- **Supervisor:** Pro.Pascal Poupart
- **Research Topics**: Multi-Modal (Video + Text) Object-Oriented Reinforcement Learning.
- **Brief Intro**: A contract-based, research oriented post-doctoral position.

SLiQ Lab, Sportlogiq
Vancouver, Canada
RESEARCH INTERN
Feb. 2020 - June, 2020

- **Supervisor:** Pro.Oliver Schulte
- **Research Topics**: Data mining on temporal-spatial sports data.
- **Brief Intro**: (1) Evaluate in-game actions of player with Temporal Difference method.
  (2) Model player information with a Bayesian hierarchical model and Variational Inference.

Cognitive Computing Lab, Baidu Research
Beijing, China
RESEARCH INTERN
Aug. 2018 - Feb. 2019

- **Supervisor:** Pro.Ping Li
- **Research Topics**: Open Information Extraction and Reinforcement Learning.
- **Brief Intro**: Extract information from Web text with Actor-Critic algorithm and Monte-Carlo Tree Search.

Structural Machine Learning Lab, Simon Fraser University
Vancouver, Canada
RESEARCH ASSISTANT
Sept. 2016 - Sept. 2020

- **Supervisor:** Pro.Oliver Schulte
- **Research Topics**: Deep Reinforcement Learning and its Interpretability.
- **Brief Intro**: (1) Develop Reinforcement Learning algorithm for computing action values in team sports.
  (2) Evaluate NHL and Soccer players performance with Deep Q-learning.

Publications

Conference Papers

- **Guiliang Liu**, Xiangyu Sun, Oliver Schulte, Pascal Poupart. "Learning Tree Interpretations for Deep Reinforcement Learning with Information Bottleneck Principle". Under review, AAAI 2020.
- **Guiliang Liu**, Oliver Schulte, Mike Rudd, Pascal Poupart, Mehrsan Javan. "Learning Agent Representations for Ice Hockey". Neural Information Processing Systems (Neurips) 2020.
- Xiangyu Sun, Jack Davis, Oliver Schulte, **Guiliang Liu**. "Cracking the Black Box: Distilling Deep Sports Analytics." ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2020.
- **Guiliang Liu**, Xu Li, Jiakang Wang, Mingming Sun, Ping Li. "Extracting Knowledge from Web Text with Monte Carlo Tree Search". The World Wide Web Conference (WWW) 2020.
- **Guiliang Liu**, Xu Li, Mingming Sun, Ping Li. "An Advantage Actor-Critic Algorithm with Confidence Exploration for Open Information Extraction". SIAM International Conference on Data Mining (SDM) 2020.
- **Guiliang Liu**, Oliver Schulte. "Deep Reinforcement Learning in Ice Hockey for Context-Aware Player Evaluation". The 27th International Joint Conference on Artificial Intelligence (IJCAI) 2018.
- **Guiliang Liu**, Oliver Schulte, Wang Zhu, Qingcan Li. "Toward Interpretable Deep Reinforcement Learning with Linear Model U-Trees". The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2018.

Journal Papers

- **Guiliang Liu**, Yudong Luo, Oliver Schulte, Tarak Kharrat. "Deep soccer analytics: Learning an action-value function for evaluating soccer players". Data Mining and Knowledge Discovery (DMKD).

Workshop Papers

- **Guiliang Liu**, Oliver Schulte. "Learning Contextualized Player Representations with A Variational Hierarchical Encoder". AI in Team sport (AIT) workshop, 2020, in the AAAI conference on artificial intelligence.
- **Guiliang Liu**, Wang Zhu, Oliver Schulte. "Interpreting Deep Sports Analytics: Valuing Actions and Players in the NHL". The Machine Learning and Data Mining for Sports Analytics workshop (MLSA) workshop, 2018, in the The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).

Scholarships

2020	**Government Scholarship**, MITACS Research Training Award.	*Canada*
2020	**School Scholarship**, Kaltenegger Family Grad School.	*Canada*
2019	**School Scholarship**, Helmut & Hugo Eppich Family Scholarships for Grad School.	*Canada*
2018	**School Scholarship**, HBackwater/Jost Scholarships for Grad School.	*Canada*
201(6-9)	**School Scholarships**, Graduate Fellowships from SFU.	*Canada*
2015	**National Scholarship**, Outstanding student, *Ministry of Education of China.*	*China*
2014(15)	**Enterprise Scholarships**, Hong Ping Chang Qing Innovation Scholarship.	*China*
2015	**Enterprise Scholarship**, Tencent Innovation Scholarship.	*China*
2015	**School Scholarship**, Merit Student Honor from SCUT.	*China*