Larkin Liu

CONTACT INFORMATION	Larkin Liu Boltzmannstraße 3, 85748 Garching bei München, DE	larkin.liu@tum.de https://larkz.github.io

CITIZENSHIP

Canadian

LANGUAGES

English (Native), Chinese (Native), German (B1)*

RESEARCH AREAS

Stochastic Optimization, Online Learning, Game Theory, Supply Chain Management, Competitive Economics

TECHNICAL SKILLS

Programming Languages (Advanced Proficiency):	Python, Scala, Kotlin
Programming Languages (Intermediate Proficiency):	C, Java, Shell, R
Distributed Computing Frameworks:	Apache Spark, Hadoop
High Performance Computing Frameworks:	SLURM, Docker
Operating Systems:	Windows, Linux, MacOS

CURRENT POSTING

Technical University of Munich   Munich, Bavaria, Germany
Doctoral Candidate in Computer Science
Focus in Machine Learning and Stochastic Games

- Working Thesis: *Algorithms for Online Learning and Optimization in Multi-Agent Systems*
- Advisor: Prof. Jalal Etesami

EDUCATION

University of Toronto   Toronto, Ontario, Canada
Master of Applied Science in Industrial Engineering   2015 - 2017
Focus in Operations Research

- Thesis: Comparative Study between Statistical Fraud Detection Methods for eCommerce
- Advisor: Prof. Viliam Makis
- Committee: Viliam Makis, Chi-Guhn Lee, Vahid Sarhangian

University of Toronto   Toronto, Ontario, Canada
Bachelor of Applied Science in Mechanical Engineering   2010 - 2015
Minor in Robotics and Mechatronics

- Graduated with Honours (cum laude)
- Ontained extra credits in Physics & Computer Science

CONFERENCE PROCEEDINGS

[C1] L. Liu, R. Downe, and J. Reid. Multi-Armed Bandit Strategies for Non-Stationary Reward Distributions and Delayed Feedback Processes. *Canadian Operational Research Society 61st Annual Conference (CORS)*. arXiv:1902.08593v1. 2019.

JOURNAL PUBLICATIONS

[J1] L. Liu, J. Luo. *mctreesearch4j*: A Monte Carlo Tree Search Implementation for the JVM. *Journal of Open Source Software*. doi:10.21105/joss.03804. 2022

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*Goethe Zertifikat B1

WORKING PAPERS

[R1] L. Liu, Y. Rong. Online Learning for Dynamic Pricing in Supplier-Retailer Stackelberg Games. *In progress.* 2023

[R2] L. Liu, M. Jusup. Large Scale Optimization via Monte Carlo Tree Search for the Maritime Bunkering Problem. *In progress.* 2023

[R3] L. Liu. Dual-Sourcing under Inventory Disruption Risk via Dynamic Programming with Monte Carlo Value Approximation. *In progress.* 2023

MANUSCRIPTS

[M1] L. Liu. Approximate Nash Equilibrium Learning for n-Player Markov Games in Dynamic Pricing. *Manuscript.* arXiv:2207.06492. 2022

[M2] L. Liu. Algorithm for Two-Phase Facility Planning via Balanced Clustering and Integer Programming. *Manuscript.* arXiv:1902.08593v1. 2020

[M3] L. Liu, J. Reid, Y.C. Lin. Improving the Performance of the LSTM and HMM Model via Hybridization. *Manuscript.* arXiv:1907.04670. 2019

WORKSHOPS

[W1] Large Scale Optimization via Monte Carlo Tree Search. Presentation - Julia and Optimization Days - Conservatoire National des Arts et Métiers (CNAM). Paris FR. 05.10.2023. ($\sim$90 Attendees).

[W2] Introduction to Stochastic Modelling and Monte Carlo Tree Search. Presentation - MDSI Workshop on Stochastic Modelling and MCTS. Garching bei München DE. 17.10.2022. ($\sim$10 Attendees)

INVITED TALKS

[P1] Online Learning in Economic Games. *Poster Presentation - Munich Data Science Institute Annual General Assembly.* Garching DE. 28.09.2023. ($\sim$10 Attendees).

[P2] Online Learning in Economic Games. *Invited Talk Series for the TUM Canadian Students Association.* München DE. 15.08.2023. ($\sim$5 Attendees).

[P3] Instrumental Variables - A Machine Learning Perspective. *PhD Seminar for Econometrics II: Causal Inference.* München DE. 19.07.2023. ($\sim$10 Attendees). Co-presenter(s): K. Wink

[P4] Online Learning and Optimization in Operations Management. *PhD Seminar at Munich Data Science Institute.* Garching bei München DE. 31.05.2023. ($\sim$5 Attendees)

[P5] Multi-Agent Reinforcement Learning in Equilibrium Economics. *Chair of Decision Science and Systems.* Garching bei München DE. 17.11.2022. ($\sim$5 Attendees)

[P6] Data Science in the Logistics Domain. *PhD Seminar at Munich Data Science Institute.* Garching bei München DE. 17.10.2022. 01.06.2022. ($\sim$15 Attendees). Co-presenter(s): J. Luo

[P7] An Extensible and Modular Design and Implementation of Monte Carlo Tree Search for the JVM. *Boston Computation Club.* Online Event. 25.10.2021. ($\sim$5 Attendees). Co-presenter(s): J. Luo

[P8] Deploying Deep Learning Models at Scale on GPU-enabled Clusters. *Databricks-Zalando Community Event.* Berlin DE. 04.06.2021. ($\sim$80 Attendees)

[P9] Recurrent Neural Networks for Quasi AB Testing. *Data Science Days Zalando.* Berlin DE. 01.06.2021. ($\sim$400 Attendees)

[P10] Multi-Armed Bandit Strategies for Non-Stationary Reward Distributions and Delayed Feedback Processes. *AISC*. Toronto CA. 2019. ($\sim$30 Attendees)

[P11] Application of Machine Learning in Advertising Technology at StackAdapt. *Guest Lecture at the University of Toronto* . Toronto CA. 2018. ($\sim$20 Attendees)

INTERVIEWS

[I1] How Data Science is Revolutionizing Digital Advertising *Invited interview at StackAdapt*. Toronto CA. 03.09.2017.

[I2] What is Artificial Intelligence? *Invited Guest on Interview with Najeeb Khan*. Toronto CA. 15.03.2017.

TECHNICAL REPORTS

[T1] L. Liu, J. Luo, An Extensible and Modular Design and Implementation of Monte Carlo Tree Search for the JVM. arXiv:2108.10061. 2021

[T2] Early Gearbox Fault Detection via Auto-Regressive Models in the Time Domain constructed from Vibrational Data. Summer Research Fellowship Program. University of Toronto. 2012

[T3] Automated Measurement of Contact Angles for Sessile Droplets using MATLAB Image analysis Library. Summer Research Assistant. University of Toronto. 2011

ARTICLES

[A1] L. Liu. Data Science Do's and Don'ts. *Online Article*. LinkedIn. 2016

TEACHING

Technical University of Munich

Modelling and Simulation in Operations Management (WI000974)	Summer 2023
Advanced Seminar: Data Science for Logistics (WIB22964SE)	Summer 2022, 2023
Stochastic Modeling and Optimization (WI000977)	Winter 2021, 2022

University of Toronto

Reliability Engineering (MIE364)	Winter 2017
Introduction to Computer Programming (APS104)	Fall, 2016

GRANTS & AWARDS

Year		Amount
2023	Grant from Freunde der TUM e.V. on Behalf of the TUM-CSA	500 EUR
2021	Dynamic Pricing Competition First Place	500 EUR
2015	Mitacs Accelerate Industry Government Joint Research Grant	C$30,000
2013	Wallace G. Chalmers Engineering Design Award	C$860
2012	University of Toronto Faculty of Applied Science Engineering Research Fellowship	C$3000
2012	Cancer Care Ontario IDEA Challenge Development Grant	C$1000
2010	Magna Family Scholarship	C$10,000

STUDENTS ADVISED

2023 B. Altinel, Master Candidate — Technical University of Munich
Master's Thesis: *Large Scale Machine Learning Systems for Maritime Logistics*

2023 S. Misfeldt, Master Candidate — Technical University of Munich
Master's Thesis: *Application of Deep Reinforcement Learning to Multi-Sourcing Strategies in Inventory Control*

2023 M. Hoaxhaj, Bachelor Candidate — Technical University of Munich
Bachelor's Thesis: *Managerial Insights for Competition in Supply Chains*

2023 L. Jayathilake, Master Candidate — Technical University of Munich
Advanced Seminar Project: *Risk Mitigation in Newsvendor Models*

2022 M. Rueda, Master Candidate — Technical University of Munich
Advanced Seminar Project: *Data-Driven Marketing Strategy for Bike Sharing System*

2022 H. Mohamed, Master Candidate — University of Strathclyde
Master Thesis: *Designing a Dynamic Game-playing AI*[†]

[†]Secondary advisor.

	2020	P. Damiba, Data Science Fellow	SharpestMinds
		Industry Project: *Predicting Click-Through Rate for Online Advertising*	
	2020	G. Swarg, Data Science Fellow	SharpestMinds
		Industry Project: *Optimizing Consumer Purchasing Behaviour for Grocery eCommerce*	
	2019	S. Badavanahalli, Data Science Fellow	SharpestMinds
		Industry Project: *Analyzing Response Times for the San Francisco Fire Department*	

REVIEWER	2022-	Referee	Journal of Open Source Software
	2022-23	Referee	International Journal of Production Economics

PUBLIC SERVICE	2022-23	University Representative/Administrator	Wharton Data Research Data Services
	2022	Technical Coach	MDSI GreenHack IT
	2022	Organizer	MDSI Workshop on Stochastic Modelling and MCTS
	2022	Undergraduate Admissions Interviewer	TUM School of Management
	2022	Volunteer	MSOM Annual Conference
	2019	Session Chair	CORS Annual Conference - Business Analytics Section

RECOGNITION	2022	Acceptance	EURO StochMod PhD School
	2015	Academic Rank of 2/202 Students	University of Toronto
	2009	Scored Top 1% in	Sir Isaac Newton Physics Contest

PROFESSIONAL MEMBERSHIP	2023-	*Member*	Society for Industrial and Applied Mathematics (SIAM)
	2022-	*President*	TU Munich Canadian Students Association (TUMCSA)
	2022-	*Member*	Munich Data Science Institute (MDSI)
	2022-	*Member*	Institute of Electrical and Electronics Engineers (IEEE)
	2015-	*Member*	Canadian Operational Research Society (CORS)
	2015-2017	*President*	University of Toronto Data Science Group (UTDSG)
	2015-2017	*Member*	University of Toronto Operations Research Group (UTORG)
	2012-2017	*Member*	University of Toronto Robotics Association (UTRA)

OTHER ACTIVITIES	2022-	Violinist	Epsilon Chamber Music Ensemble
	2012-	IT Consultant	Freelance