

CONTACT INFORMATION	Larkin Liu Arcisstraße 21, 80333 München, DE	larkin.liu@tum.de https://larkz.github.io
LANGUAGES	English (Native), Chinese (Native), German (Goethe Zertifikat B1)	
CITIZENSHIP	Canadian	
RESEARCH INTERESTS	Stochastic Decision Processes, Monte Carlo Methods, Reinforcement Learning, Software Design, Business Analytics, Causal Inference, Deep Learning	
TECHNICAL SKILLS	Programming Languages (Advanced Proficiency): Programming Languages (Intermediate Proficiency): Distributed Computing Frameworks: Operating Systems:	Python, Scala, Kotlin C, Java, Shell, R Apache Spark, Hadoop Windows, Linux, MacOS
CURRENT POSTING	Technical University of Munich Doctoral Candidate in Operations Research Chair of Logistics and Supply Chain Management <ul style="list-style-type: none"> Working Thesis: <i>Applications of Reinforcement Learning and Monte Carlo Methods for Markov Decision Processes in the Logistic Domain</i> Advisor: Prof. Dr. Stefan Minner 	Munich, Bavaria, Germany 2021 - Present
EDUCATION	University of Toronto Master of Applied Science, Industrial Engineering Focus in Operations Research <ul style="list-style-type: none"> Thesis: Comparative Study between Statistical Fraud Detection Methods for eCommerce Advisor: Prof. Dr. Viliam Makis Committee: Viliam Makis, Chi-Guhn Lee, Vahid Sarhangian University of Toronto Bachelor of Applied Science, Mechanical Engineering Minor in Robotics and Mechatronics <ul style="list-style-type: none"> Graduated with Honours (cum laude) Extra Credits in Physics & Computer Science 	Toronto, Ontario, Canada 2015 - 2017 Toronto, Ontario, Canada 2010 - 2015
TEACHING EXPERIENCE	Course Instructor - Stochastic Modeling and Optimization (WI000977) <i>Technical University of Munich</i> <ul style="list-style-type: none"> Deliver course materials, prepare lectures, and provide student support. Mentor <i>SharpestMinds</i> <ul style="list-style-type: none"> Prepared tutorials and lessons in mathematics, statistics, computer science and machine learning for mentees who wish to work in the industry based out of Canada and the USA. Past Mentees: <ul style="list-style-type: none"> P. Damiba, Data Scientist G. Swarg, Data Engineer S. Badavanahalli, Software Developer 	Winter 2021 January 2019 - September 2020 US Citizenship and Immigration Services (2020) Canada Foodbank (2020) CNET (2019)

	Teaching Assistant - Reliability Engineering (MIE364) Winter 2017 <i>University of Toronto</i> <ul style="list-style-type: none"> • Provided exam and assignment grading in addition to student support.
	Teaching Assistant - Introduction to Computer Programming (APS104) Fall 2016 <i>University of Toronto</i> <ul style="list-style-type: none"> • Provided laboratory and tutorial instruction.
INDUSTRY EXPERIENCE	Zalando SE Berlin, Germany Applied Scientist January 2020 - October 2021 <ul style="list-style-type: none"> • Worked extensively on the development of new Recurrent Neural Network architectures scripted in PyTorch for the application of Causal Inference on time series data, deployed on GPU's. Loblaw Companies Ltd. Toronto, Ontario, Canada Data Scientist August 2018 - January 2020 <ul style="list-style-type: none"> • Research and development on Mixed Integer Programming algorithms for optimal path planning in the fulfillment pick-up mobile application. StackAdapt Inc. Toronto, Ontario, Canada Data Scientist October 2016 - August 2018 <ul style="list-style-type: none"> • Lead a team of 3 software engineering interns, and 2 software engineers reporting directly to the CTO for StackAdapt's for 16 months. Developed the first production grade Real Time Bidding optimization engine. Paytm Labs Toronto, Ontario, Canada Visiting Scientist June 2015 - September 2016 <ul style="list-style-type: none"> • Built experimental prototypes for fraud detection classification using traditional machine learning techniques, such as Logistic Regression, Random Forest, as well stochastic modelling techniques, such as Hidden Markov Models. RBC Capital Markets Toronto, Ontario, Canada Research Student June 2014 - April 2015 <ul style="list-style-type: none"> • Applied multivariate Box-Jenkins Modelling on financial securities trading data to value of potential portfolio assets via robust forecasting metrics. Advanced Micro Devices Inc. Toronto, Ontario, Canada Reliability Engineering Intern May 2013 - May 2014 <ul style="list-style-type: none"> • Performed quality and reliability testing of discrete GPU's under computational load in order to characterize the statistical reliability of hardware.
JOURNAL PUBLICATIONS	L. Liu, J. Luo. <i>mctreesearch4j</i> : A Monte Carlo Tree Search Implementation for the JVM. <i>Journal of Open Source Software</i> [In Review]. 2021
CONFERENCE PROCEEDINGS	L. Liu, R. Downe, and J. Reid. Multi-Armed Bandit Strategies for Non-Stationary Reward Distributions and Delayed Feedback Processes. <i>In Canadian Operational Research Society 61st Annual Conference (CORS)</i> . arXiv:1902.08593v1 . 2019
MANUSCRIPTS	L. Liu. Algorithm for Two-Phase Facility Planning via Balanced Clustering and Integer Programming. <i>Manuscript available</i> . arXiv:1902.08593v1 . 2020

	L. Liu, J. Reid, Y.C. Lin. Improving the Performance of the LSTM and HMM Model via Hybridization. <i>Manuscript available.</i> arXiv:1907.04670 . 2019	
INVITED TALKS	<p>An Extensible and Modular Design and Implementation of Monte Carlo Tree Search for the JVM. <i>Invited Speaker at Boston Computation Club</i>. Online Event. 25.10.2021</p> <p>An Extensible and Modular Design and Implementation of Monte Carlo Tree Search for the JVM. <i>Invited Speaker at SharpestMinds Technical Deep Dive Series</i>. Online Event. 2021</p> <p>Deploying Deep Learning Models at Scale on GPU-enabled Clusters. <i>Invited at Speaker Databricks-Zalando Community Event</i>. Online Event. 2021</p> <p>Recurrent Neural Networks for Quasi AB Testing. <i>Invited Speaker at Data Science Days Zalando</i>. Online Event. 2021.</p> <p>Multi-Armed Bandit Strategies for Non-Stationary Reward Distributions and Delayed Feedback Processes. <i>Invited Speaker at AISC</i>. Toronto ON Canada. 2019.</p> <p>Application of Machine Learning in Advertising Technology at StackAdapt. <i>Guest Lecturer at the University of Toronto School of Continuing Studies</i>. Toronto ON Canada. 2018.</p> <p>How Data Science is Revolutionizing Digital Advertising <i>Invited interview at StackAdapt</i>. Toronto ON Canada. 2017.</p> <p>What is Artificial Intelligence? <i>Invited Guest on Interview with Najeeb Khan</i>. Toronto ON Canada. 2017.</p>	
TECHNICAL REPORTS	<p>L. Liu, J. Luo, An Extensible and Modular Design and Implementation of Monte Carlo Tree Search for the JVM. <i>Manuscript available.</i> arXiv:2108.10061. 2021</p> <p>Early Gearbox Fault Detection via Auto-Regressive Models in the Time Domain constructed from Vibrational Data. Summer Research Fellowship Program. University of Toronto. 2012</p> <p>Automated Measurement of Contact Angles for Sessile Droplets using MATLAB Image analysis Library. Summer Research Assistant. University of Toronto 2011</p>	
ARTICLES	L. Liu. Data Science Do's and Don'ts. <i>Online Article</i> . Available on LinkedIn . 2016	
GRANTS & AWARDS	<ul style="list-style-type: none"> • Mitacs Accelerate Industry Government Joint Research Grant (2015) • Wallace G Chalmers Engineering Design Award (2013) • Faculty of Applied Science Engineering Research Fellowship (2012) • Cancer Care Ontario IDEA Challenge Development Grant (2012) • Magna Family Scholarship (2010) 	<p>C\$30,000</p> <p>C\$860</p> <p>C\$3000</p> <p>C\$1000</p> <p>C\$10,000</p>
RECOGNITION	<ul style="list-style-type: none"> • Accepted into Stochastic Modelling EURO PhD School • Class Rank of 2/202 Students in Final Semester - University of Toronto • Sir Isaac Newton Physics Contest top 1% of all Contestants 	<p>2021</p> <p>2015</p> <p>2009</p>
PUBLIC SERVICE	<ul style="list-style-type: none"> • <i>Session Chair for Business Analytics Section</i>, CORS Annual Conference 	2019
MEMBERSHIP	<ul style="list-style-type: none"> • <i>Member</i>, Boston Computation Club • <i>Member</i>, German-Chinese Association of Artificial Intelligence (GCAAI) 	<p>2021-</p> <p>2020-</p>

- *Member*, Artificial Intelligence Socratic Circles (AISC) 2018-
- *Member*, London Computation Club 2016-
- *Member*, Canadian Operational Research Society (CORS) 2015-
- *President*, University of Toronto Data Science Group (UTDSG) 2015-2017
- *Member*, University of Toronto Operational Research Group (UTORG) 2015-2017
- *Member*, University of Toronto Robotics Association (UTRA) 2012-2017