

# Jia Lin Hau

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## EDUCATION

**University of New Hampshire**, Advisor: Marek Petrik 01/2019 - present  
**M.S / Ph.D. in Computer Science** GPA: 4.00

**Relevant Coursework:** Reinforcement Learning, Advance Machine Learning, Mathematical Optimization, Algorithms, Computer Graphics, Assembly Language, System Programming, Formal Specification, Database System.

**University of New Hampshire**, Advisor: Linyuan Li 09/2015 - 09/2018  
**B.S. in Applied Mathematics: Economics** GPA: 3.89

**Relevant Coursework:** Machine Learning, Forecasting Analysis, Numerical Methods, Multi-Dimensional Calculus, Econometrics, Probability Theory, Statistical Inference, Financial Mathematics.

## REVIEWING

International Conference on Machine Learning 2022 (ICML)  
NeurIPS 2021 Workshop on Safe and Robust Control of Uncertain Systems

## EXPERIENCE

**UNH Computer Science Department - Research Assistant** 06/2020 - present  
Research interest: Reinforcement learning, risk-averse optimization, machine learning, Bayesian method.

**UNH Computer Science Department - Teaching Assistant** 01/2019 - 05/2020  
Assembly Language and Machine Organization (CS 520), Scientific Programming in Python and C (CS 410P & C), Computer networks (CS 725)

**Boston Road Runner – Data Analyst** 09/2018 - 12/2018

- Preprocessed (handle missing values, duplicates, and apply consistent formatting) data of participants and sponsors.
- Developed auto-regression time series models in R to predict future trends in the number of participants for upcoming races.
- Design 3NF database schema using ERD and relation schema to reduce anomalies and improve data quality and integrity.
- Created data visualizations using Tableau, which allow peers and sponsors easily interpret and understand data insights.

**Idea Math - Junior Instructor/ Summer Camp Resident Assistant** 06/2018 - 08/2019

**UNH International Student Organization (ISO) - Vice President** 08/2017 - 06/2018

**UNH Mathematics Center - Mathematics Center Tutor** 09/2017 - 06/2018

**UNH Residential Life - Resident Assistant** 08/2016 - 08/2017

## RESEARCH PUBLICATIONS AND PREPRINTS

**Entropic Risk Optimization in Discounted MDPs.** Jia Lin Hau, Marek Petrik, Mohammad Ghavamzadeh AISTATS 2023

- Contributed to advancing risk averse Markov decision processes (MDPs) by providing new theoretical results and practical algorithms.
- Proposed new polynomial time MDPs algorithms for Entropic Risk Measure (ERM) and Entropic Value at Risk (EVaR) objectives.
- Proved our algorithms return the optimal policy for finite horizon MDPs and delta-optimal policy for infinite horizon MDPs.
- Implemented these algorithms and conducted extensive experimentation to evaluate their accuracy and efficiency using Julia and R.

**RASR: Risk-Averse Soft-Robust MDPs.** Jia Lin Hau, Marek Petrik, Mohammad Ghavamzadeh, Reazul Russel ArXiv 2022

- Proposed a novel framework to jointly model the epistemic and aleatory uncertainties in safe Reinforcement Learning (RL).
- Proved that entropic risk-aversion can be solved optimally and efficiently in RASR setting with time-dependent dynamic program.

**Robust pest management using RL.** Talha Siddique, Jia Lin Hau, Shadi Atallah, Marek Petrik RLDM 2019

- Leveraged reinforcement learning techniques to develop a robust framework for risk-averse decision-making in pest management.
- Applied natural splines regression model to predict pest growth and STAN Bayesian inference language to generate posterior datasets, which were used to compute the optimal Robust MDP policy.
- Demonstrated the effectiveness of our framework by solving various domains including Cartpole (OpenAI) with limited data in Python

## OTHER ONGOING RESEARCH

**Risk measure decompositions analysis** 01/2023 - present

**Multi-Layered chemical diffusion 3D simulation** 02/2023 - present

## PROJECTS

**EMOAI** Emotion recognition application to avoid depression – *Developer and Use Case Finder* 02/2019 - 04/2019

- Spearheaded Deep Learning (CNN) emotion recognition project with pre-trained models to accurately classify users' facial expressions.
- Proposed groundbreaking application of the use of facial and emotion recognition technology to identify and prevent depression.

- Implemented active learning with PyTorch, enable personalized classification by allowing users to update labels of their own emotion.

**CRACC** A social application that connect people to play sports together – ***Analyst / Android Developer*** 01/2017 - 01/2018

- Collected data from various sources (API, Kaggle, BLS), analyzed and created data visualizations with Python.
- Communicated effectively with the IOS team to ensure consistent UI (XML) and functionality (Java) using Android Studio.
- Integrated with Firebase for users' data, and developed features that query weathers and navigation data based on users' location.

## OTHER ACHIEVEMENTS

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Passed <b>Actuarial Science</b> Exam P: Probability	2018
<i>Bloomberg Market Concepts (BMC)</i> Completion	2018
Member of <i>Pi Mu Epsilon</i> of National Honorary <b>Mathematics</b> Society	2017

## SKILLS

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**Language:** Python, R, Julia, C/C++, SQL, MATLAB, HTML, CSS, JavaScript, XML, Java

**Tools:** OpenGL, PyTorch, Numpy, Scikit-learn, Caret, Git, Excel, ERDPlus, Tableau