Kiarash Aghakasiri

MSc in Computer Science

My Webpage | kiarashk76 | li-kiarashk76 | aghakasi@ualberta.ca | 7806554741

Work Experience

HUAWEI EDMONTON CO | Support Researcher

Jun 2022 – Present | Edmonton, Canada

- Designed a multi-scale objective function, Ψ, that improves the ranking aspect of well-known objective, ΔE, w.r.t human preference for the task of color correction
- Implemented featurization ideas to the novel method of Genetic Monte Carlo Tree Search (GMCTS) for CompilerGym environments.
- Developed a Fusion-Aware Hardware-Software search optimization which emperically showed more than 10% improvement over the baseline in latency metric.

HUAWEI EDMONTON CO | Support Research Intern

Jan 2021 – Jun 2021 | Edmonton, Canada

- Developed a new cost model for Tensor Optimization with Halide to capture the model uncertainty using heteroscedastic regression under team lead Chao Gao (Python, Pytorch, C).

UNIVERSITY OF ALBERTA | Research Assistant under Supervision of Dr. Müller

Mar 2020 – Jun 2022 | Edmonton, Canada

- RLAI Lab member
- Proposed a new Algorithm UA-MCTS to adapt Monte Carlo Tree Search (MCTS) behaviour with model uncertainty. Emperically proved that UA-MCTS outperforms MCTS in uncertain domains.
- Proposed a new Algorithm DQ-MCTS from combination of DQN and MCTS (Simpler version of AlphaZero) to overcome model uncertainty in MCTS.

Projects

UNCERTAINTY-ADAPTED MCTS | Python, Pytorch, Numpy

2019-2022 → Link to Thesis **Supervised by Martin Müller**

- Proposed Uncertainty-Adapted Monte Carlo Tree Search (UA-MCTS) to utilize MCTS-like search in imperfect domains.
- Empirically showed that UA-MCTS outperforms MCTS's performance in MinAtar environments under model inaccuracy.

HETEROSCEDASTIC REGRESSION TO IDENTIFY MODEL BIAS | Python, Pytorch, Numpy

2020 → Link to Report **Instructed by Martha White**

- Investigated the utility of heteroscedastic regression for estimating the part of predictive uncertainty that can not be captured by parameter uncertainty.
- Empirically demonstrated that heteroscedastic regression can capture aleatoric and structural uncertainties and the learned estimator using heteroscedastic regression optimization process automatically focuses on the more certain parts of the dataset.

STUDYING SENSITIVITY AND PERFORMANCE OF TD(λ) | Python, Pytorch, Numpy

2020 → Link to Report **Instructed by Rich Sutton**

- Implemented True Online TD(λ) algorithm and empirically investigated its performance by gradually changing the λ parameter to understands the sensitivity of the algorithm to λ parameter.

Teaching Experience

UNIVERSITY OF ALBERTA | Teaching Assistant

Sep 2019 – Apr 2021 | Edmonton, Canada

- Basics of Machine Learning (instructor: Dr. Martha White)
- Intro to Foundation of Computing (instructors: Dr. Sadaf Ahmed, Dr. Joerg Sander)

IRAN UNIVERSITY OF SCIENCE & TECHNOLOGY | Teaching Assistant

Sep 2016 – Jun 2019 | Tehran, Iran

- Computational Intelligence (instructor: Dr. Mozayani)
- Natural Language Processing (instructor: Dr. Eetemadi)
- AI and Expert Systems (instructor: Dr. Pilehvar)
- Theory of Languages & Automata" (instructor: Dr. Rahmani).

Education

UNIVERSITY OF ALBERTA

Master's in Computer Science

Sep 2019 - May 2022 | Edmonton, Canada

Supervisor: Martin Müller

Cum. GPA: 4.0 / 4.0

IRAN UNIVERSITY OF SCIENCE & TECHNOLOGY

Bachelor's in Computer Engineering

Sep 2015 - Jul 2019 | Tehran, Iran

Supervisors: Nasser Mozayani & Sauleh Eetemadi

Cum. GPA: 3.87 / 4.0 (17.78 / 20)

IMAGE CAPTIONING FOR FARSI LANGUAGE | Python, Pytorch, Tensorflow

2018 → **Link to BSc thesis (in Farsi)** Supervised by **Nasser Mozayani**

- ➔ Created the first Farsi translated version of MSCoCo dataset
- ➔ Implemented a nueral network architecture using ”attention” mechanism on the translated dataset.

Publication

- ➔ Kiarash Aghakasiri, Farnaz Kohankhaki, Hongming Zhang, Ting-Han Wei, Chao Gao, and Martin Müller. Monte Carlo Tree Search in the Presence of Transition Uncertainty. Under Review: AAAI, 2024
- ➔ Bahador Rashidi, Kiarash Aghakasiri, Chao Gao, Shuting Zhang, Yue Zhang, Ying Liu, and Fengyu Sun. A Multi-Scale Objective Function for Camera Color Correction. Under Review: ICASSP, 2024.
- ➔ Bahador Rashidi, Shan Lu, Kiarash Aghakasiri, Chao Gao, Fred Xuefei Han, Zhisheng Wang, Laiyuan Gong and Fengyu Sun. CASCO: Cascaded Co-Optimization for Holistic Neural Network Acceleration. DATE, 2024.
- ➔ Fatemeh Karimkhani, Hossein Rahmani, Arezoo Zare, Raana Sahebnassagh, and Kiarash Aghakasiri. Tarvajeh: Word Association Norms for Persian Words. Journal of Psycholinguistic Research (2021): 1-20.

Honors & Awards

- ➔ Suceeded to graduate as the 2nd Top Student in BSc among 64
- ➔ Gained an opportunity to continue MSc at Sharif University of Technology without taking the national entrance examination
- ➔ Being a member of National Organization for Development of Exceptional Talent (NODET)
- ➔ Achieved a price for being among the 12th best booths in the ”18th Exhibition of Research, Technology Achievements and Techmart”

Courses / Certificates

- ➔ CIFAR DLRL Summer School
- ➔ Reinforcement Learning Specialization
- ➔ Intro to Machine Leanring (Instructor: Martha White)
- ➔ Deep Learning for NLP (Instructor: Lili Mou)
- ➔ Reinforcement Learning I (Instructor: Martha White)
- ➔ Reinforcement Learning II (Instructor: Rich Sutton)

References

Martin Müller, Professor, University of Alberta
✉ mmueller@ualberta.ca
Ting-Han Wei, Post Doctoral Fellow, University of Alberta
✉ tinghan@ualberta.ca
Chao Gao, Senior Researcher, Huawei Edmonton Co
✉ chao.gao4@huawei.com
Nasser Mozayani, Associate Professor, Iran University of Science & Technology
✉ mozayani@iust.ac.ir
Sauleh Eetemad, Assistant Professor, Iran University of Science & Technology
✉ sauleh@gmail.com