Ehsan (Eric) Qasemi

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Education

University of Southern California (Los Angeles, CA), *PhD.* in Computer Science 2023
University of Wisconsin-Madison (Madison, WI), *MSc.* in Computer Science 2018
University of Tehran (Tehran, Iran), *BSc.* in Electrical Engineering 2015

Work Experience and Internships

Oracle Co. **Los Angles, CA**
Research Intern Sep 2022–Apr 2023
- Introduced and implemented AutoUnload feature in Oracle Heatwave, reducing memory footprint by up to 5x.
- Developed Unload Advisor (recommender) features in Oracle Heatwave, enhancing cluster performance by up to 10x.

Bosch LLC. **Pittsburgh, PA**
Hybrid AI Research Intern May–Aug 2022
- Proposed a novel synthetic captioning method to incorporate traffic domain knowledge into video-language models, to improve Traffic question/answering performance of selective video-language models by 20%.

Bosch LLC. **Pittsburgh, PA**
Hybrid AI Research Intern May–Aug 2021
- Developed and deployed neuro-symbolic approaches for intelligent traffic monitoring with hybrid AI.

Information Sciences Institute **Marina Del Ray, CA**
Research Intern May–Aug 2018
- Devised a symbolic meta-Learning approach for automated ML in high-dimensional datasets, resulting in a 12% average improvement in normalized scores in the DARPA's D3M challenge.

Academic Research Experience

Multi-Modal Preconditioned Inference of Commonsense Knowledge (PhD Thesis) 2018-2023
- Instituted the problem of preconditioned inference to evaluate AGI's understanding of the *theory of affordance*.
- Proposed a generative AI based on weak supervision principles that surpasses the SoTA in preconditioned inference.
- Published multiple first-authored research papers in major conferences, including EMNLP, AACL, and IJCAI.
- Conducted research on knowledge-guided multi-modal commonsense inference in various applications such as traffic management and urban map understanding, using generative weak supervision.
- Led a team of 5 students (including 2 NSF's REU recipients) in developing a resource on multi-modal preconditioned inference through weak supervision.

Graph Representation for Table Understanding 2019
- Designed and implemented a framework for ontology mapping through graph neural network embeddings
- Consolidated resources of commonsense knowledge into an integrated commonsense knowledge graph (CSKG)

Discovery of Autism Spectrum Disorder (ASD) 2016–2018
- Designed and structured a deep recurrent model for early ASD prediction using human-motion data

Skills

Programming Languages: Python, C, C++, Java, Scala, Julia
ML/DS: Torch, Tensorflow, Ray
Database: SQL, Redis, ElasticSearch, MongoDB, Stardog
Web React, JS, CSS, HTML, Flask

Awards

3'rd place in Semantic Web Challenge on Tabular Data to Knowledge Graph Matching League ISWC 2019
Research Scholarship Recipient from University of Southern California (2018) 2018
1'st place in National Digital System Design Competition, HW/SW Co-design League CADS 2013

Selected Publication

- PaCo: Preconditions Attributed to Commonsense Knowledge, **Qasemi E**, Ilievski F, Chen M, Szekely P., EMNLP-Findings 2022.
- PInKS: Preconditioned Inference with Weak Supervision, **Qasemi E**, Khanna P, Ning Q, Chen M., AACL-IJCNLP 2022.
- PRISM: Preconditioned Visual Language Inference and Rationalization using Weak Supervision", **Qasemi E**, Maina-Kilaa A, Dash D, Alsaggaf K, Chen M., under rev. EMNLP 2023
- Affective and Dynamic Beam Search for Story Generation, Huang T, **Qasemi E**, Li B, Wang H, Brahman F, Chen M, Chaturvedi S, under rev. EMNLP 2023
- Traffic-Domain Video Question Answering with Automatic Captioning, **Qasemi E**, Francis J. M., Oltramari A., ITSC2023
- Intelligent Traffic Monitoring with Hybrid AI, **Qasemi E**, Oltramari A., AI for Autonomous Driving workshop at IJCAI, 2022.