Sina Mohseni

Deep Learning Safety · Explainable AI · Human-AI Collaboration

Langford Center, B208, 3137 TAMU, College Station, Texas 77840

(+1) 541-745-8849 | sina.mohseni@tamu.edu | people.tamu.edu/ sina.mohseni/ | sinamohseni | sina-mohseni

Objective

Talented computer science PhD Candidate with 8+ years of experience in research, patents, publications, and 4+ years of experience in design and evaluation of machine learning techniques and Human-AI Collaboration systems. Passionate to use my technical and leadership skills to run innovative projects as a computer science research scientist. Seeking a research-oriented full-time position for Fall 2020.

Professional Experience

Deep Learning Safety Research Intern at Nvidia

Santa Clara, California

"Out-of-distribution Error Detection for DNN Algorithms", Nvidia Drive. *Apr. 2019 - Aug. 2019*

- Proposed a new out-of-distribution error detection method based on self-supervised training. (PyTorch) (Published at AAAI-2020, Pending US patent)
- Studied relation between classic engineering safety methods and deep learning safety-related techniques. (Published at SafeAI 2020 workshop)
- Designed a transfer learning approach for model failure prediction in autonomous vehicle applications. (PilotNet, TensorFlow)

Research Intern at Bosch Research and Technology Center

Pittsburgh, Pennsylvania

"Integrating Crowd and AI for LiDAR Data Annotation in Self-driving Cars Application", Crowd-AI Project. *May. 2018 - Aug. 2018*

- Implemented a 3D LiDAR data annotation tool for crowdworkers to create training data for self-driving car applications. (Three.js)
- Designed and implemented micro task and work flows for LiDAR data annotation in Amazon Mechanical Turk. (MongoDB, Flask)

Graduate Research Assistant at Texas A&M University

College Station, Texas

"Explainable Artificial Intelligence", DARPA XAI Grant *Aug. 2017 - Present*

- Proposed a multidisciplinary design and evaluation framework for Explainable AI systems.
- Crowdsourced evaluation of a interpretable fake news detection system.
- Designed a user centered interpretable machine learning interface for our fake news detection system.
- Created a human judgment evaluation benchmark for attention explanations from interpretable machine learning technique.

"Analytic Provenance Visualization and Segmentation", NSF Research Grant. *Sept. 2016 - Mar. 2018*

- Designed a user interaction clustering and visualization method for provenance retrieval. (D3.js)
- Designed a provenance segmentation method to segment user work by user interaction processing. (D3.js, Scikit-learn, Gensim)

Graduate Research Assistant at Oregon State University

Corvallis, Oregon

"Shrinkage Factor CAD Automation Toolbox", Center for e-Design Grant *Jan. 2016 - Aug. 2016*

- Implemented a design automation toolbox to apply investment casting shrinkage factors at Design Engineering Lab with Prof. Matt Campbell. (Parasolid kernel, Solidworks)

Graduate Research Assistant at Babol Noshirvani University

Babol, Iran

"Competition Over Resource: A new Metaheuristic Optimization Algorithm", Digital Signal Processing Lab *Jan. 2014 - Aug. 2015*

- Designed a new meta-heuristic optimization algorithm based on competitive behavior of animal groups and later used in array antenna design, resulting in five peer-reviewed papers. (Matlab)

"Facial Expression Recognition", Digital Signal Processing Lab *Sept. 2013 - Dec. 2014*

- Developed a facial expression recognition algorithm to improve recognition accuracy by leveraging anatomical structure of human face. (Matlab)

Technical Skills

Languages:	Python, C++, C#, MATLAB, JavaScript.
Machine Learning:	PyTorch, TensorFlow, Scikit-learn, OpenCV, LIME, Gensim, SpaCy, XGBoost.
Visualization and UI:	D3.js, Three.js, Matplotlib.
Crowdsourcing:	Workflow and Micro Task Design, User Behavior Analysis, Micro-payment Models, Task Expert-pool.
UX and HCI:	User Centered Design, Usability Test, Controlled Experiment Design, Empirical Methods and Statistical Analysis, Interaction Logs Analysis.

Education

Texas A&M University *College Station, Texas*

Computer Science Ph.D. Candidate *Sept. 2016 - PRESENT*

- Proposal Topic: Toward a design and evaluation framework for explainable machine learning systems.

Babol Noshirvani University *Babol, Iran*

M.Sc. in Electronic Engineering *Sept. 2012 - Dec 2014*

- Thesis: Facial Expression Recognition Based on Anatomy of Face

University of Isfahan *Isfahan, Iran*

B.Sc. in Electrical and Electronic Engineering *Sept. 2007 - Dec 2011*

Patents

Insulator Leakage Current Monitoring and Alarm System in Power Transmission Systems *Iran*

National Patent No.: IRP/021579 *Summer 2015*

Blood Pressure Monitor Calibrating Device and Corresponding Method *Euro-PCT*

International Patent No.: PCT/EP2012/070412 *Spring 2010*

Publications

Selected Peer-Reviewed Publications

[1] **Mohseni, Sina**, Pitale, M., Yadawa, J., & Wang, Z.. "Self-Supervised Learning for Generalizable Out-of-Distribution Detection.". AAAI Conference on Artificial Intelligence, AAAI, 2020.

[2] **Mohseni, Sina**, Pitale, M., Singh, V., & Wang, Z.. "Practical Solutions for Machine Learning Safety in Autonomous Vehicles.". Safe AI Workshop at AAAI 2020.

[3] **Mohseni, Sina**. "Toward Design and Evaluation Framework for Interpretable Machine Learning Systems." Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society. ACM, 2019.

[4] **Mohseni, Sina**, Zarei, N., and Ramazani, S.. "Facial expression recognition using anatomy based facial graph." Systems, Man and Cybernetics (SMC), 2014 IEEE International Conference on. IEEE, 2014.

Selected Preprint

[5] **Mohseni, S.**, Zarei, N., Ragan, E.. A Multidisciplinary Survey and Framework for Design and Evaluation of Explainable AI Systems. arXiv preprint arXiv:1811.11839, 2019.

[6] **Mohseni, S.**, Ragan, E., Hu, Xia. Open Issues in Combating Fake News: Interpretability as an Opportunity. arXiv preprint arXiv:1904.03016v1, 2019.

Honors & Awards

Research Grant (PI), Golestan Province Power Distribution Co. *Gorgan, Iran*

"Insulator Leakage Current Monitoring System in Power Transmission Systems" *Oct. 2014 - Aug. 2015*

- Developed a creepage current meter device which measures micro ampere current from ceramic power transmission insulators.
- Gained more expertise in proposal writing, project management and problem solving.

Research Grant (Co-PI), Isfahan Province Regional Power Distribution Co. *Isfahan, Iran*

"Study on Effects of CFL Lamp on Power Distribution System" *Mar. 2011 - Sept. 2011*

- Researched current harmonic effects on power distribution system by performing harmonic analysis in Matlab.
- Learned proposal writing and project management skills.

Research and Travel Awards

- TAMU Industrial Affiliates Program Research Competition: 2nd Place Award.
- AIES Conference Travel Award 2019, 20
- Texas A&M Computer Science Department Travel Grant for AAAI Conference 2020
- Grace Hopper Celebration Travel Award 2018

Professional Services

Paper Reviewer for CHI, IUI, UIST, CSCW, and VIS conferences since 2017.

Paper Reviewer for ICML and ICWSM conferences since 2019.