MANDANA SAEBI

msaebi@nd.edu . Notre Dame, IN . LinkedIn . Website

PROFESSIONAL SUMMARY

Machine Learning Engineer and Data Scientist with four years of experience in developing novel machine learning models for learning from graph-structured data. Research focuses on Large-scale Graph Analysis, Recommendation, Information Retrieval, Deep Learning, Reinforcement Learning, Meta-Learning, and Language Modeling.

EDUCATION

University of Notre Dame, Notre Dame, IN   *Jan 2017- Present*
Ph.D. in Computer Science, *Adviser: Prof. Nitesh Chawla*   Overall GPA: 3.8

University of Notre Dame, Notre Dame, IN   *Sept. 2015 - Dec. 2016*
M.Sc. in Electrical Engineering, *Adviser: Prof. Peter Bauer*   Overall GPA: 3.5

Iran University of Science and Tech, Tehran, Iran   *Sept. 2011- May 2015*
B.Sc. in Electrical Engineering   Overall GPA: 3.6

TECHNICAL SKILLS

Technical Skills: Python (Proficient), R, C++, Spark, Pytorch, Tensorflow, SickitLearn, Keras, Numpy, rdkit, OpenFST, Kaldi, SQL, AWS, MATLAB, AMPL, Tableau, ArcGIS, Latex, Microsoft Office

Certificates: Neural Networks and Deep Learning (Coursera), Sequence Models (Coursera), Building deep learning applications with Keras 2.0 (LinkedIn) , NLP with Python for Machine Learning (LinkedIn), Building Recommendation Systems with Python (LinkedIn), Advanced SQL for data scientists (LinkedIn)

PROFESSIONAL EXPERIENCE

University of Notre Dame   Jan 2017 – Present
Graduate Research Assistant

- Developed a deep reinforcement learning method for explainable heterogeneous relational reasoning in knowledge graphs (accepted in TKDD).
- Designed a meta learning method for few-shot knowledge graph completion (accepted in EMNLP 2020).
- Improved the prediction of chemical reaction performance by 5% using a deep learning approach by integrating domain expert knowledge and complex molecular graph interactions via LSTMs and graph neural networks.
- Developed a higher-order network embedding method resulting in significant improvement (up to 71.5%) on classification, clustering, and link prediction accuracy over several machine learning algorithms.
- Achieved significant improvement (up to 52.4%) on the task of anomaly detection on synthetic and real-world taxi traffic data by developing a scalable algorithm for detecting anomalies in the large sequential data.

Microsoft   June 2021 - Aug 2021
Data Science Intern   *Bellevue, WA*

Developing a deep learning framework for predicting the optimal bid price for online auction market design.

Apple   June 2020 - Sept 2020
Machine Learning Research Intern   *Cupertino, CA*

Developed a discriminative knowledge graph driven language model resulting in improving speech recognition performance (up to 50% reduction in WER) on named-entities using a scalable, and adaptable approach.

Tala   May 2019 - Aug 2019
Data Science Intern   *Santa Monica, CA*

- Implemented a deep learning framework for unsupervised domain adaptation resulting in boosting the target domain predictions with no labeled data up to 5.7%; The model transfers knowledge from a country with rich financial labeled data to another country with no labeled data.

AWARDS & TALKS

- Winner of the ACM Student Research Competition at The Grace Hopper Celebration 2020

- Awarded full travel grant to attend Interspeech 2021

- Awarded full Grace Hopper Scholarship 2019 from AnitaB.org (Sponsored by Boeing)
- Invited talk at KDD 2019 Workshop in Anomaly Detection in Finance, Anchorage, USA
  Title: Higher-Order Networks for Anomaly Detection
- Awarded full travel grant to attend 2020 CRA Grad Cohort

SELECTED PUBLICATIONS

1. **Saebi, M.**, Krieg, S., Zhang, C., Jiang, M., & Chawla, N. "*Heterogeneous Relational Reasoning in Knowledge Graphs with Reinforcement Learning*, (To appear in TKDD)

2. **Saebi, M.**, Pusateri, E., Meghawat A., Van Gysel, C., "A Discriminative Entity-Aware Language Model for Virtual Assistants", To appear in INTERSPEECH 2021.

3. **Saebi, M.**, Nan, B., Herr, J., Wahlers, J., Wiest, O., & Chawla, N. (2021)."*Graph Neural Networks for Predicting Chemical Reaction Performance*"

4. Zhang, C., Yu, L., **Saebi, M.**, Jiang, M., & Chawla, N. "*Few-Shot Multi-Hop Relation Reasoning over Knowledge Bases*, In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing: Findings (pp. 580-585).

5. **Saebi, M.**, Ciampaglia, G. L., Kaplan, L. M., & Chawla, N. V."*HONEM: Learning Embedding for Higher Order Networks*", Big Data 8, no. 4 (2020): 255-269.

6. **Saebi, M.**, Xu, J., Curasi, S. R., Grey, E. K., Chawla, N. V., & Lodge, D. M. "*Network Analysis of Ship-borne Species Introduction and Dispersal in the Arctic*", Sci Rep 10, 19558 (2020).

7. **Saebi, M.**, Xu, J., Kaplan, L., Ribeiro, B., & Chawla, N. "*Efficient Modeling of Higher-Order Dependencies in Networks: From Algorithm to Application for Anomaly Detection*", EPJ Data Science 9 (2020): 1-22.

8. Zhang, C., Yu, L., **Saebi, M.**, Jiang, M., & Chawla, N. "*Multi-Hop Meta Relation Learning for Knowledge Bases*", (Under review in TKDE)

9. **Saebi, M.**, Xu, J., Grey, E. K., Lodge, D. M., Corbett, J. J., & Chawla, N. "*Higher-Order Patterns of Aquatic Species Spread through the Global Shipping Network*", PLoS one, 15(7), e0220353.

10. Nwanganga, F., **Saebi, M.**, Madey, G., & Chawla, N. "*A Minimum-Cost Flow Model for Workload Optimization on Cloud Infrastructure*", IEEE CLOUD 2017: 480-487

LEADERSHIP AND SERVICE

- Served as the Research Track program committee member for ECML PKDD 2020.

- Served as the Data Science Committee Member for GHC 2019.

- **University of Notre Dame**; Social chair of Notre Dame Grad SWE board   2018-2019

- **University of Notre Dame**; Graduate CSE Engineering mentor   2017-2020

- **University of Notre Dame**; Graduate student board representative   2018-2020

- **Iran University of Science and Tech**; Vice president of the Student Scientific Association   2014-2015

- **Iran University of Science and Tech**; Leader of The Official Robotic Laboratory   2013-2014