



Behzad Shayegh

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EDUCATION

M.Sc. in Computing Science

Sep. 2022 – Expected: Aug. 2024

University of Alberta, Edmonton, Canada; GPA: 4.0/4.0

Thesis: Leveraging the Knowledge of Different Grammar Inducers to Achieve New Knowledge in Low-resource Scenarios

B.Sc. Major in Computer Engineering, Minors in Computer Science

Sep. 2017 – Aug. 2022

University of Tehran, Tehran, Iran

Thesis: Locating Street Addresses from Informal Persian Texts using IDF-Adapted Kernel-Based Hierarchical Bayesian Models

Publications

Shayegh, B., Cao, Y., Zhu, X., Cheung, J. C.K., Mou, L. (Oct. 2023). **Ensemble Distillation for Unsupervised Constituency Parsing**. arXiv preprint arXiv:2310.01717.

WORK EXPERIENCE

Research (Mitacs) Intern at Borealis AI, Toronto, Canada

Sep. 2023 – Jan. 2024

- Addressed the over-smoothing problem in multi-teacher knowledge distillation with heterogeneous teachers.
- Developed a novel definition of averaging over syntax trees, enabling a state-of-the-art ensemble approach integrating the latest unsupervised constituency parsers, thus bridging the gap between supervised and unsupervised methods.

Graduate Research Assistant at NLP Group, University of Alberta, Edmonton, Canada

Sep. 2022 – May. 2024

- Discovered disagreement among various unsupervised constituency parsers by conducting a comparative study.
- Used meta-learning techniques to create a bridge between different languages to transfer natural language syntax supervision in an unsupervised manner.
- Performed chunking knowledge transferring from unsupervised models in English to other languages and beat state-of-the-art in Germany and Persian by 13% and 3% in terms of chunking f1-score, respectively.

Data Scientist at Divar (the most popular Iranian classified ads platform), Tehran, Iran

Feb. 2022 – Jul. 2022

- Conducted error analysis, followed by the formulation of “wideness-ratio,” a novel metric for dynamic interval estimation that adjusts interval length based on the real-world standard deviation of comparable data points.
- Led the redesign of the used-car price estimator, implemented a dynamic interval predictor, and achieved a 40% reduction in wideness-ratio while maintaining the same level of accuracy.
- Leveraged insights from domain experts and price data pattern analysis to uncover unknown categorical features, which were inferred using Gaussian Mixture Models and improved the MAPE metric of price estimation by 4%.
- Improved the MAPE metric of the car price estimator using statistical approaches for outlier detection.

Research Intern at 4-Choob, Tehran, Iran

Jun. 2019 – Sep. 2021

- Carried out end-to-end research on locating street addresses from informal Persian texts, demonstrating self-reliance in data preparation, problem and satisfaction definition, benchmark and model design, development, and evaluation.
- Spearheaded the feature extraction task, successfully identifying and extracting over 400 efficient features for real-estate price estimation robust to price-index fluctuations.

SKILLS

Programming and Script Languages: Python [Expert], R, C/C++, SQL, Bash

Python Tools: PyTorch [Proficient], TensorFlow, Keras, NumPy and Pandas [Expert], NLTK, Scikit-learn, Matplotlib, Seaborn

Other Software: Git, LATEX [Proficient], DVC, Spreadsheet/Excel [Expert], Jupyter/Colab

Technical Expertise: NLP (Natural Language Processing), NLI (Inference), NLG (Generation), NLU (Understanding), RL, Unsupervised Learning, Semi/Weak/Indirect Supervision, Meta Learning, ML, Statistics, Statistical ML, Mixture of Experts (MoE), Statistical Analysis, Statistical Inference, Probability Theory, Probabilistic Graphical Models, EM Algorithm, Bayesian Models, Markov Models, Graph Theory, Algorithms, Combinatorics, Complexity Theories, Data Structures, Data Analysis, Linear Algebra, Object-oriented Software Design, Database Design

Languages: English [Proficient], Persian [Native]