Mohaddeseh Bastan

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Research Focus Natural Language Processing, Deep Learning, Machine Learning, Explainable AI

Education

Stony Brook University — Stony Brook, US
Ph.D. in Computer Science (3.9/4) — Sep. 2017 - Aug. 2023

Amirkabir University of Technology — Tehran, Iran
M.Sc. in Artificial Intelligence (3.7/4) — Sep. 2014 - Feb. 2017

Amirkabir University of Technology — Tehran, Iran
B.Sc.in Software Engineering (3.8/4) — Sep. 2010 - Aug. 2014

Computer Skills

- **Programming Languages**
  Python, Java(SE), Java(EE), C, C++
- **NLP Tools**
  Moses, Giza++, NLTK, SRILM, OpenNLP
- **Machine Learning Tools**
  Tensorflow, PyTorch, Blocks, Theano, Weka

Work Experience

- **Data Science Intern**, Microsoft (May. 2021 - Aug 2021)
  - Working under supervision of Vishal Chowdhary in Machine Translation team
  - Design and develop an unsupervised machine translation evaluation system
  - Design a set of adversarial tests to measure the model performance in large scale
  - Using language agnostic algorithms on large scale live translation data
- **Data Science Intern**, Microsoft (May. 2020 - Aug 2020)
  - Working under supervision of Benjamin Han in Text Analytics group in collaboration with Chenguang Zhu in Microsoft Research
  - Design and develop a factual corrector model for abstractive summarization
  - Create a dataset based on the possible actions and necessary modifications to improve abstractive summarization
  - Using knowledge graph in addition to the transformer model to find and correct the errors in abstractive summaries
- **Teaching Assistant**, Stony Brook University (Aug. 2017 - May 2018)
  - Natural Language Processing — Fall 2018
  - Introduction to Theory of Computation, — Spring 2018
  - Artificial Intelligence — Fall 2017

Honors & Awards

- *Awarded an Excellence as a TA, Stony Brook University* — 2018-2019
- *Awarded full scholarship for attending Grad Cohort Workshop* — 2019, 2020
- *Awarded the travel grant for ICLR and ICML* — 2019
- *Granted Merit Fellowship for 3 years, Stony Brook University* — 2017-2020

Publications

- **Bastan, M.**, Lal, Y., *SBU Figures It Out: Models Explain Figurative Language*, FigLang@EMNLP (2022)
- **Bastan, M.**, et al, *BioNLI: Generating a Biomedical NLI Dataset Using Lexico-semantic Constraints for Adversarial Examples*, EMNLP (2022) Link
- **Bastan, M.**, Khadivi, S., *A Preordered RNN Layer Boosts Neural Machine Translation in Low Resource Settings*, Proceedings of the 5th Workshop on Technologies for MT of Low Resource Languages, LoResMT@COLING (2022) Link
- **Bastan, M.**, et al, *SuMe: A Dataset Towards Summarizing Biomedical Mechanisms*, Language Resource and Evaluation Conference, LREC (2022) Link
- **Bastan, M.**, et al, *Author Sentiment Prediction* , 28th International Conference on Computational Linguistics, COLING (2020) Link
- Gaonkar, R., Kwon, H., **Bastan, M.**, Balasubramanian, N., & Chambers, N. . *Modeling label semantics for predicting emotional reactions*, ACL (2020) Link
- **Bastan, M.**, et al, *Neural Machine Translation on Scarce-Resource Condition: A case-study on Persian-English*, ICEE (2017) Link
- Aghasadeghi, A. and **Bastan, M.**, *Monolingually Derived Phrase Scores for Phrase Based SMT using Neural Networks Vector Representations*, International Conference on New Research Achievements in Electrical & Computer Engineering (2016) Link

Top Academic Projects

- Build a **reliable AI** system using **constrained text generation** techniques. I created **BioNLI** a dataset for biomedical natural language inference dataset. This dataset consists of fully automatic **adversarial** instances created with **rule based** and **neural based** text generation methods. website
- Build an **explainable AI** system using generative **transformer** models for information extraction from biomedical scientific literature. First define what is an explanation and then generate these explanations using transformers. website
- Design and implementation of a sentiment analyzer model using **BERT** and deep learning techniques for long documents in **news domain**. This system heuristically finds the main entity (person) in the article and predicts the author's sentiment towards the main entity with a **transformer-based** technique which is pretrained to focus on the entity. website
- Design and implementation of a translation system Using **Deep Recurrent Neural Networks** as M.Sc. thesis. This system uses statistical and neural machine translation features jointly to improve translation quality. Two main features we used for our NMT are reordering and alignment. We changed **cost function** for improving alignment model and added a **reordering layer** to improve translation quality.
- Designing and Implementing a simultaneous **Summarizer and Translator** for news using Genetic Algorithm in Java for **B.Sc. Final Project** github

Extracurricular Activities

- Mentoring highschool students as a part of the HWISE program (High School Woman in Science and Engineering) 2018-2020
- Event Coordinator, Vice President of Iranian Graduate Student Association 2018-2020