

BELIZ GUNEL

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Education

Stanford University

Sep 2017 – Sep 2022 (expected)

Doctor of Philosophy, Electrical Engineering

Research Areas: Representation Learning, Natural Language Processing, Machine Learning Systems, Medical Imaging

Stanford University

Sep 2017 – Dec 2019

Master of Science, Electrical Engineering

University of California – Berkeley

2013-2017

Bachelor of Science, Electrical Engineering and Computer Science, Honors Degree.

Experience

Stanford Electrical Engineering PhD Candidate, advised by Prof. John Pauly

Sep 2017 – Present

Previous & Current Collaborators: Prof. Christopher Ré, Prof. Aksbay Chaudhari, Prof. Shreyas Vasanavala

- Developed a semi-supervised consistency training framework with physics-driven data augmentations that improves data efficiency and robustness to distribution drifts over the state-of-the-art image reconstruction algorithms.
- Developed mixed-curvature embedding representations in product spaces that reduced distortion by 32% on Facebook social network dataset, and improved word analogy accuracy over Euclidean methods by 3.4 points.
- Developed a weakly supervised image reconstruction framework using convolutional image priors that considerably improves performance over supervised and self-training baselines in low data regimes.
- Developed non-Euclidean word embedding methods that achieved up to +17 F1 points improvements over Euclidean methods in relation extraction for hierarchical relationships in low dimensions. (hypere.stanford.edu)

Google Brain, Mountain View, CA

Sep 2021 – Dec 2021

Student Researcher with Yao Zhao, Peter Liu, and David Grangier.

- Developed a discrete sentence-level language modeling approach based on VQ-VAEs for coherent long-form generation and paraphrasing.
- Proposed and developed a new learned coherency metric and evaluated on human-written and GPT-3 written text.

Facebook AI, Menlo Park, CA

May 2020 – Sep 2020

Research Intern with Jingfei Du, Alexis Conneau, Ves Stoyanov, and Necip Fazil Ayan.

- Developed a supervised contrastive learning method for pre-trained language model fine-tuning, effective in few-shot learning, while training with noisy datasets, and for generalization to related tasks with limited labeled data.
- Helped develop a state-of-the-art data augmentation approach that leads to scalable and effective self-training for text classification tasks, along with strong gains on knowledge-distillation and few-shot learning.

Google Research, Mountain View, CA

Jan 2020 – May 2020

Research Intern with Navneet Potti, James Wendt, Sandeep Tata, and Marc Najork.

- Developed a multi-domain transfer learning algorithm for data-efficient information extraction from form-like documents (in production).
- Improved the existing information extraction pipeline up to +25.9 F1 in some fields over best competing Google Cloud NLP/CV models, which contributed to the pipeline taking part in Google Cloud Document AI Beta Launch; early work featured in Google AI blog.

Microsoft Research, Redmond, WA

June 2019 – Sep 2019

Research Intern with Chenguang Zhu, Michael Zeng, and Xuedong Huang.

- Developed models for fact-aware and coherent abstractive text summarization by incorporating knowledge from Wikidata knowledge graph into a Transformer-XL based encoder-decoder architecture.
- Gave talks on the work at MSR, Google Ads AI, Google Research, IBM Research, and Jane Street.

Publications

- Gunel, Beliz et al. “Supervised Contrastive Learning for Pre-trained Language Model Fine-tuning”. ICLR, 2021.
- Desai Arjun & Gunel, Beliz et al. “VORTEX: Physics-Driven Data Augmentations for Consistency Training for Robust Accelerated MRI Reconstruction” MIDL, 2022 (oral presentation).
- Adamson, Phil et al. “SSFD: Self-Supervised Feature Distance as an MRI Image Reconstruction Quality Metric”. Deep Inverse, NeurIPS, 2021.
- Gunel, Beliz et al. “Data-Efficient Information Extraction from Form-like Documents”. Document Intelligence, KDD, 2021.
- Gunel, Beliz et al. “Weakly Supervised MR Image Reconstruction using Untrained Neural Networks”. ISMRM, 2021.
- Tata, Sandeep et al. “Glean: Structured Extractions from Templatic Documents”. VLDB, 2021.
- Du, Jingfei et al. “Self-training Improves Pre-training for Natural Language Understanding”. NAACL, 2021.
- Gunel, Beliz et al. “Mind the Facts: Knowledge-Boosted Coherent Abstractive Text Summarization”. KR2ML, NeurIPS, 2019.
- Gu, Albert et al. “Learning Mixed-Curvature Representations in Products of Model Spaces”. ICLR, 2019.
- Gunel, Beliz et al. “Hyperbolic Word Embeddings”. WiML, NeurIPS (2018).

Professional Service

- **Reviewer** for Relational Representational Learning (NeurIPS 2018), Women in Machine Learning (NeurIPS 2018 & 2019), Representation Learning on Graphs and Manifolds (ICLR 2019), Learning and Reasoning with Graph-Structured Data (ICML 2019), Graph Representation Learning (NeurIPS 2019), Graph Representation Learning and Beyond (ICML 2020), DiffGeo4DL (NeurIPS 2020), NAACL 2021, ICML 2021, ACL 2021, ICML 2022, NeurIPS 2022.
- **Program Committee** in “Graph Neural Networks and Systems” workshop in MLSys 2021.
- **Co-organizer** of “Representation Learning on Graphs and Manifolds” workshop in ICLR 2019.