Victor Prokhorov

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Research Summary

My research has revolved around the development of techniques for producing interpretable and structured latent representations for text and images. In the past few years, my main focus has been on developing the representations within the Variational Autoencoder framework. The research in this direction can facilitate controlled generation at the latent representation level, faithful attribute binding (in the multi-modal setting) and more generally make an analysis of the generative models easier.

Work experience

University of Edinburgh Edinburgh, UK
Research Associate (Host: N. Siddharth, Ivan Titov) April 2022 - April. 2024
Project (learning of interpretable representation of images and text): this project seeks to develop a middle-ground approach that can learn generative models over multimodal data at scale while also capturing interpretable representations of such data to facilitate xAI.

Montreal Institute for Learning Algorithms (MILA), Montreal, Canada
Internship (Host: Siva Reddy) Sep.- Dec. 2020
Project (symbolic representations for text): instead of pretraining a model to learn distributed representation of text which has been proven useful in transfer learning setup, in the project we aimed to induce reusable, graph-based symbolic representation of text.

Education

University of Cambridge Cambridge, UK
PhD in Computation, Cognition and Language 2017 – 2021
Thesis: Injecting inductive Biases into Distributed Representation of Text
Supervisors: N. Collier, E. Shareghi

University of Cambridge Cambridge, UK
MPhil in Advanced Computer Science 2016 – 2017
Supervisors: N. Collier, P. Lio, T. Pilehvar Distinction

University of Bristol Bristol, UK
BEng in Computer Science and Electronics 2013 – 2016
Supervisor: N. Dahnoun First Class (Hons)

Grants

Mitacs Globalink Research (Mitacs, Awarded;has not been accepted) 2020
Student Travel Grant (Workshop: Neural Generation and Translation) 2019

Representative Works

Google Scholar

Autoencoding Conditional Neural Processes for Representation Learning
Victor Prokhorov, Ivan Titov and Siddharth N

ArXiv, 2023

StrAE: Autoencoding for Pre-Trained Embeddings using Explicit Structure
Mattia Opper, **Victor Prokhorov** and Siddharth N
EMNLP (main conference), 2023

Learning Sparse Sentence Encoding without Supervision: An Exploration of Sparsity in Variational Autoencoders
Victor Prokhorov, Yingzhen Li, Ehsan Shareghi and Nigel Collier
Proceedings of the 6th Workshop on Representation Learning for NLP, 2021

Unsupervised Representation Disentanglement of Text: An Evaluation on Synthetic Datasets
Lan Zhang, **Victor Prokhorov** and Ehsan Shareghi
Proceedings of the 6th Workshop on Representation Learning for NLP, 2021

On the Importance of the Kullback-Leibler Divergence Term in Variational Autoencoders for Text Generation
Victor Prokhorov, Ehsan Shareghi, Yingzhen Li, Mohammad Taher Pilehvar and Nigel Collier
Proceedings of the 3rd Workshop on Neural Generation and Translation, 2019

Unseen Word Representation by Aligning Heterogeneous Lexical Semantic Space
Victor Prokhorov, Mohammad Taher Pilehvar, Dimitri Kartsaklis, Pietro Lio, Nigel Collier
Proceedings of the AAAI Conference on Artificial Intelligence, 2019

Teaching experience

Department of Theoretical and Applied Linguistics (University of Cambridge) Michaelmas 2019
Course: Computational Linguistics (Organiser: Nigel Collier)
Responsibilities: Supervision of a small group of students (3-4 people). Mark homework and help with the understanding of the key concepts introduced in the course.

Talks and posters

On the Importance of the Kullback-Leibler Divergence Term in Variational Autoencoders for Text Generation 2020
AI+pizza, Microsoft Research Cambridge, Cambridge, UK (Poster)

From Representation to Generation of Text 2019
Google NLP Summit, Zurich, Switzerland (Poster)

Programming

Python, PyTorch

Service

Reviewer: ICLR 2022, ACL ARR 2021
Organization: co-organiser for Dagstuhl ELLIS NLP Workshop (2022); co-organiser for Edinburgh NLP Meetings (ongoing)