BRYAN EIKEMA

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EDUCATION

Ph.D. Student Natural Language Processing 2019 - present
supervised by Dr. Wilker Ferreira Aziz
Institute for Logic Language and Computation, University of Amsterdam

Master Artificial Intelligence 2015 - 2018
Master's Thesis: Auto-Encoding Variational Neural Machine Translation
University of Amsterdam *Cum Laude*

Bachelor Computer Science 2012 - 2015
Bachelor's Thesis: BGP Routing Security and Deployment Strategies
University of Amsterdam *Cum Laude*

RESEARCH

The Inadequacy of the Mode in Neural Machine Translation 2020
University of Amsterdam, joint work with dr. Wilker Ferreira Aziz
summary: We study the probability distributions learned by neural machine translation (NMT) systems and find that oftentimes the most likely translations accumulate so little probability mass that the mode can be considered essentially arbitrary. We find that many pathologies and biases, usually ascribed to NMT as a model or its estimation procedure, are at least partially due to the use of mode-seeking search for generating translations. We show that, while the mode is often inadequate, the inferred distributions are of good quality and thus propose a direction for research into decision rules that take into account the probability distribution holistically in generating translations.
preprint: `https://arxiv.org/abs/2005.10283`

Auto-Encoding Variational Neural Machine Translation 2018/2019
University of Amsterdam, joint work with dr. Wilker Ferreira Aziz
summary: We propose a deep generative model for neural machine translation that addresses variation inherent to parallel datasets. We show improved translation performance at little additional computational cost. We further extend this model to incorporate monolingual data using variational inference to fill in the missing side of the data. We train our models using several gradient estimation techniques and find decent improvements in translation performance.
RepL4NLP 2019: `https://www.aclweb.org/anthology/W19-4315/`
Master's thesis (2018): `https://esc.fnwi.uva.nl/thesis/centraal/files/f344704273.pdf`
code: `https://github.com/Roxot/AEVNMT.pt`

TEACHING

VI Tutorial University of Alicante 2020
University of Alicante, Spain
description: I helped teach the variational inference (VI) Tutorial at the University of Alicante, Spain. The VI tutorial is an intense 3-day tutorial teaching deep generative models, variational inference through reparameterization (continuous latent variables), REINFORCE with variance reduction techniques (discrete random variables) and discrete relaxations through the Gumbel softmax.

Deep Learning for Natural Language Processing 2019
Master Artificial Intelligence, University of Amsterdam
role: Teaching Assistant
course contents: This course teaches the essential architectures and parameter estimation procedures used in modern natural language processing. It spans NLP tasks from learning lexical representations, to part-of-speech tagging, to machine translation. Additionally, the students are introduced to Bayesian concepts for NLP, covering Bayesian neural networks and variational inference, Bayesian dropout, and variational auto-encoders for text.

Basic Probability: Theory 2019
Master Artificial Intelligence, University of Amsterdam
role: Teaching Assistant
course contents: This course teaches the basics of probability theory and statistics to students that have had no previous exposure to these topics. It covers probability theory concepts such as discrete and continuous random variables, conditional independence, Bayes rule, correlation and covariance as well as fundamental statistics concepts such as maximum likelihood estimation and the EM algorithm.

Natural Language Processing II 2019
Master Artificial Intelligence, University of Amsterdam
role: Teaching Assistant
course contents: This course teaches about latent variable models for structure prediction in NLP, it covers models such as mixture models, HMMs, latent variable CRFs and deep generative models; learning paradigms such as MLE and approximate posterior inference.

PROFESSIONAL SERVICES

COLING 2020 Reviewer
Multilingual processing, Machine Translation and Translation Aids track

HONORS & AWARDS

Young Talent Encouragement Award 2013
Discipline of Informatics and Technical Informatics
Royal Holland Society of Sciences and Humanities

LANGUAGES

Dutch (native), English (fluent), Romanian (intermediate)