DENIS JERED MCINERNEY

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Personal Website ● LinkedIn ● Google Scholar ● Github

EDUCATION

Northeastern University, Boston   September 2018 - Present
PhD in Computer Science, GPA: 3.75/4.0
Khoury College of Computer Science

Johns Hopkins University, Baltimore   Fall 2014 - Spring 2018
Bachelor of Science, GPA: 3.6/4.0, Dean's List 2014-2018
Majors: Physics and Computer Science, Minor: Mathematics

PUBLICATIONS

Preprints

1. Denis Jered McInerney, Geoffrey Young, Jan-Willem van de Meent, and Byron C. Wallace. Chill: Zero-shot custom interpretable feature extraction from clinical notes with large language models. *Under review at the Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*, 2023

Peer-reviewed Conferences

1. Sanjana Ramprasad, Iain J Marshall, Denis Jered McInerney, and Byron C Wallace. Automatically summarizing evidence from clinical trials: A prototype highlighting current challenges. In *Proceedings of the conference. Association for Computational Linguistics. Meeting*, volume 2023, page 236. NIH Public Access, 2023

2. Denis Jered McInerney, Geoffrey Young, Jan-Willem van de Meent, and Byron C Wallace. That's the wrong lung! evaluating and improving the interpretability of unsupervised multimodal encoders for medical data. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*, volume 2022, page 3626. NIH Public Access, 2022

3. Denis Jered McInerney, Borna Dabiri, Anne-Sophie Touret, Geoffrey Young, Jan-Willem Meent, and Byron C. Wallace. Query-focused ehr summarization to aid imaging diagnosis. In *Machine Learning for Healthcare Conference*, pages 632–659. PMLR, 2020

Workshops

1. Denis Jered McInerney, Luyang Kong, Kristjan Arumae, Byron C. Wallace, and Parminder Bhatia. Kronecker factorization for preventing catastrophic forgetting in large-scale medical entity linking. In *NeurIPS Workshop on Machine Learning for Public Health*, 2021

EXPERIENCE

Northeastern University   Fall 2018 - Present
Professor Byron C. Wallace and Professor Jan-Willem van de Meent
PhD Research:

- Currently working on a pipeline for presenting evidence to clinicians to help prevent diagnostic errors.
- Developed an inherently interpretable method for classification with electronic health records through using LLMs to extract high-level interpretable features posed by clinicians without supervision.
- Studied the fine-grained alignments between image and text in multimodal pre-trained models in the clinical domain.
- Worked on incorporating loss based on latent variables into generative modeling to bridge the gap between generative and contrastive losses for representation learning.
- Created an extractive summarization model for medical documents using ICD codes as distant supervision.
- Adapted the pointer-generator model for summarization to use a Transformer instead of an LSTM.

Amazon Comprehend Medical   Spring 2023
Chris Kong, Xuanqing Liu, and Adit Krishnan
Developed methods for adapting Large Language Models to a target domain without needing to update the weights of the LLM.

Salesforce Research   Summer 2021
Nazneen Rajani and Wojciech Kryściński
Multi-document Summarization: Worked on techniques to summarize multiple news documents while extracting facts and determining which ones were corroborated by different sources and which facts conflicted.

Amazon Comprehend Medical   Summer 2020
Parminder Bhatia, Chris Kong, and Kristjan Arumae
Continuous Learning in Medical Entity Linking: Developed techniques that mitigate catastrophic forgetting when training sequentially on a diverse set of clinical datasets for entity linking.

John's Hopkins University Center for Language and Speech Processing   Summer 2017 - Spring 2018
Professor Benjamin Van Durme
Information Retrieval: Developed a pipeline to create a topic classifier for documents in a corpus for any given topic. It can be given a topic specified in natural language and will create a document classifier for that topic on-the-fly.

John's Hopkins University Center for Language and Speech Processing   Spring 2017
Professor Mark Dredze
Sentiment Analysis of Social Media for Healthcare: Helped to develop machine learning classification algorithms to identify twitter users that have the flu.

Compact Muon Solenoid (CMS) Alignment group at CERN   Summer 2015 - Summer 2016
Professor Andrei Gritsan
Particle Physics: Developed a 3D visualization for the movement of individual modules in the CMS detector and worked on implementing an addition to the alignment algorithm for the CMS detector that takes into account curvature of individual modules in the detector. Awarded *Provost's Undergraduate Research Award* to travel to CERN to analyze Monte-Carlo data in order to reduce noise in Higgs Boson experiments.

PRESENTATIONS

New England Natural Language Processing Day, Poster, Contributed Talk   Spring 2022
CHiLL: Crafting High-Level Latents

Brigham and Women's Hospital/Boston University, Invited Talk   Fall 2022
Natural Language Processing in Radiology

Empirical Methods in Natural Language Processing, Poster, Contributed Talk   Fall 2022
That's the Wrong Lung!

New England Natural Language Processing Day, Contributed Talk   Spring 2022
That's the Wrong Lung!

NeurIPS Workshop on Machine Learning in Public Health, Contributed Talk   Fall 2021
Kronecker Factorization for Preventing Catastrophic Forgetting

Machine Learning for Healthcare, Poster, Contributed Talk   Summer 2020
Query-focused EHR Summarization to Aid Imaging Diagnosis

SKILLS AND COURSEWORK

Coursework: Natural Language Processing, Computer Vision, Probablistic Modeling, Advanced Machine Learning, Advanced Algorithms, Dynamical Systems, Reinforcement Learning, Information Visualization, Programming Languages
Languages: Proficient in Python, C, C++, Java, Javascript, CSS, HTML
Other Programming Experience: Linux environments, Bash scripts, Git, Python Notebooks, R Notebooks, AWS EC2 instances, Google Cloud Compute Engine, Heroku, Python Flask Server, Mechanical Turk, Docker, Keras, Pytorch, Mxnet/Gluon, OpenCV

SERVICE

Reviewer *Converences*: NAACL-HLT (2021), ACL-IJCNLP (2021), Trustworthy AI for Healthcare (2022), ACM SIGKDD (2022), ACL ARR (November 2021, January 2022, April 2022, July 2022), EMNLP (2022, 2023)
Workshops: EMNLP Workshop on New Frontiers in Summarization (2019), ICLR Workshop on Machine Learning for Preventing and Combating Pandemics (2021), NeurIPS Workshop on Robustness in Sequence Modeling (2022)

Teacher, O'Bryant High School Machine Learning Outreach Program   Spring 2022

Guest Lecturer for Practical Neural Networks
Multimodal Models   Spring 2022
Summarization Models   Fall 2020

Mentor, Charlie Denhart, Undergraduate Research   Spring 2021

REFERENCES

Byron C. Wallace, Ph.D.
Associate Professor, Computer Science, Northeastern University
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Jan-Willem van de Meent, Ph.D.
Associate Professor, Computer Science, University of Amsterdam
j.w.vandemeent@uva.nl

Geoffrey S. Young, M.D.
Associate Professor, Harvard Medical School
Radiologist, Brigham and Women's Hospital
gsyoung@bwh.harvard.edu

Chris (Luyang) Kong
Senior Applied Scientist, Amazon Web Services
luyankon@amazon.com