David Mueller

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Center for Language & Speech Processing, Johns Hopkins University, 3400 N. Charles St., Hackerman 319 Baltimore, MD 21218-2608 (U.S.A.)

Research interests

Multi-Task Optimization for Deep Neural Networks, Learning Dynamics & Generalization in Deep Learning, Multilingual Natural Language Processing, Large Language Model Training Efficiency, Robustness & Shortcut Learning.

Education

2018 – Present	Johns Hopkins University – Baltimore, MD PhD in Computer Science Advisors: Professor Mark Dredze & Dr. Nicholas Andrews
2018 - 2020	Johns Hopkins University – Baltimore, MD MS in Computer Science Advisors: Professor Mark Dredze & Dr. Nicholas Andrews
2012 – 2016	University of Texas at Austin – Austin, TX BS in Computer Science Mentors: Professor Greg Durrett

Research experience

Sept 2018 –	Johns Hopkins University (PhD Student, Research Assistant)
Present	Mentors: Professor Mark Dredze & Dr. Nicholas Andrews.
	My PhD thesis is on "The Role of Conflict in Multi-Task Learning"; my work is broadly
	focused on improving optimization & generalization in deep learning when consid-
	ering multiple objectives, including multi-task and multi-lingual learning scenarios.
June 2023 –	Netflix (Machine Learning Research Intern)
Sept 2023	Mentor: Dr. Shervin Ardeshir
	Machine learning research intern on the Promotional Media team at Netflix, working
	on multi-modal and multi-task optimization for scene ranking and retrieval.

Jul 2017 - TAUR Lab - University of Texas (Undergraduate Researcher)

Jul 2018 Mentors: Professor Greg Durrett.

Worked on efficient methods for Entity Linking in Noisy Natural Language Processing settings. The project began as a class project and continued to a conference publication at EMNLP 2018.

Publications

- 2024 <u>David Mueller</u>, Mark Dredze, Nicholas Andrews, **Multi-Task Transfer Matters During Instruction-Tuning**, *Findings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024)*
- 2022 <u>David Mueller</u>, Mark Dredze, Nicholas Andrews, **The Importance of Temperature in Multi-Task Learning**, *Optimization for Machine Learning Workshop @ NeurIPS* 2022 (OPT 2022)
- 2022 <u>David Mueller</u>, Nicholas Andrews, Mark Dredze, **Do Text-to-Text Multi-Task** Learners Suffer from Task-Conflict?, Findings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2022)
- 2020 Steven Reich, <u>David Mueller</u>, Nicholas Andrews, **Ensemble Distillation for Structured Prediction**, *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP 2020)*
- 2020 <u>David Mueller</u>, Nicholas Andrews, Mark Dredze, **Sources of Transfer in Multilingual Named Entity Recognition**, *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL 2020)*
- 2018 <u>David Mueller</u>, Greg Durrett, **Effective Use of Context in Noisy Entity Linking**, Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018)

Pre-Prints & In Submission

- 2024 <u>David Mueller</u>, Mark Dredze, Nicholas Andrews, **Can Optimization Trajectories Explain Multi-Task Transfer?**, In Submission to Transactions on Machine Learning Research (TMLR)
- 2024 Suzanna Sia, <u>David Mueller</u>, Kevin Duh, **Where does In-Context Machine Trans**lation Happen in Large Language Models?, In Submission to the 38th Conference on Neural Information Processing Systems (NeurIPS 2024)

Teaching experience

Fall 2019Teaching Assistant for Machine Learning at Johns Hopkins University
(CS 601.475)Besponsible for lectures, office hours, homework & even writing, covering full

Responsible for lectures, office hours, homework & exam writing, covering fundamental machine learning topics and algorithms. Topics ranged from classical machine learning algorithms to modern deep neural networks and FATE in AI.

Talks

Sept 2023 Where Does Negative Transfer Come From? On the Implicit Bias of SGD in Multi-Task Learning Center for Language and Speech Processing, Johns Hopkins University Video Recording

Community service

2020 – Present **CLSP Graduate Admissions Committee (Johns Hopkins University)** Responsible for the reviewing applications for admissions to the 2021, 2022, 2023, and 2024 CLSP Graduate Program.

Reviewer service

NeurIPS 2022, 2023, 2024
ICML 2020*, 2022, 2023
ICLR 2020*, 2021*, 2022, 2024
AISTATS 2022, 2023, 2024
EMNLP 2020*, 2021, 2022
ACL-IJCNLP 2020*, 2021, 2022, 2023
COLM 2024
ARR 2022, 2023
OPT 2023
*Secondary Reviewer

Professional memberships

2018 – Present Association for Computational Linguistics (ACL)

Technical skills

Programming languages

Proficient in: Python, Go, Java Familiar with: Ruby, Javascript

Software LATEX, Git, PyTorch, Tensorflow

Languages English (fluent), Spanish (conversational)

Other interests

Reading (Fantasy, Historical & Science Fiction), Music (Guitar & Piano), Cocktails, Vegetarian Food, Brazilian Jiu-Jitsu, Running