Josh Myers-Dean

Website
Github
Google Scholar

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Boulder, CO

Education

University of Colorado, Boulder — Boulder, CO
Computer Science, Ph.D. - GPA: 4.0/4.0 — *Fall 2021 - Present*
Advisor: *Danna Gurari*

Western Washington University — Bellingham, WA
Computer Science, BSc.; Mathematics Minor — *Awarded June 2021*
Advisors: *Scott Wehrwein, Filip Jagodzinski*

Research Experience

University of Colorado, Boulder — Boulder, CO
Graduate Research Assistant — *August 2021 - Present*

- **Visual Question Answering**: Investigating approaches to hierarchical vision-language tasks.
- **Few-Shot Learning**: Implemented non-meta learning based approaches, along with a contrastive regularization, to *generalized* few-shot semantic segmentation using PyTorch.

Pacific Northwest National Laboratory — Richland, WA
NLP Research Intern - Applied Statistics and Comp. Modeling — *August 2020 - September 2021*

- **Speaker Diarization**: Investigated the removal of poor audio segments to improve speaker diarization metrics.
- **Information Retrieval**: Developed a simple yet effective pipeline using zero-shot learning and Transformers to extract fine-grained labels for a given entity. Accelerated using PySpark.
- **Multimodal Relationships**: Investigating the relationship between poor ASR results and audio representations (e.g. embeddings, mel spectograms) to identify untrustworthy audio segments for downstream tasks.

Western Washington University, Computer Science Dept. — Bellingham, WA
Undergraduate Research Assistant — *April 2019-June 2021*

- **Computational Photography**: Using per-pixel features from deep neural networks to improve lower-level computer vision and image processing tasks such as range masking, seam carving, and graph cuts.
- **International Border Detection**: Implemented deep learning and classical machine learning techniques on Bing satelite imagery to identify international border legibility.
- **Dimensionality Reduction**: Trained a multi-layer perceptron using triplet loss to reduce the dimensionality of deep features while maintaining a notion of inter-class similarity.

Work Experience

CU Boulder, Computer Science Dept. — Boulder, CO
Grader - Neural Networks & Deep Learning — *January 2022 - May 2022*

- **Grading**: Graded and provided detailed feedback to graduate student research projects.

Pacific Northwest National Laboratory — Richland, WA
Technical Intern - Biosurveillance Mobile App. Development Competition — *June 2020 - August 2020*

- **Unity**: Utilized Unity3D to build a training application for the Oculus Go over a 10 week period. This was a competition in which my team took first place.
- **Scrum**: Participated in daily stand up meetings as well as adhere to weekly sprints.
- **Shareholder Communication**: Held weekly presentations with both internal and external shareholders to ensure sufficient progress was being made.

Western Washington University, Computer Science Dept. Bellingham, WA

Teaching Assistant - Intro to Computer Vision, Computer Graphics *September 2020 - March 2021*

- **Mentorship & Grading**: Held weekly office hours and graded exams, homeworks, and projects for both graduate and undergraduate students.

Western Washington University, Associated Students Bellingham, WA

Web Applications Developer *April 2019 - June 2020*

- **Full Stack Development**: Utilized Django, ReactJS, Docker, and Azure hosting to create responsive web applications that are used daily by students, faculty, and staff at WWU.
- **Rest API**: Created REST API's using Golang Gin for a lost and found web application while utilizing ReactJS for the client-facing side of the application.
- **Web Accessibility**: Worked within a team to ensure our web pages were accessible and compliant with WCAG 2.0 standards, as well as participate in accessibility sprints when needed. Achieved a SiteImprove score of over 98%.

Publications

† Denotes equal contribution

- **Josh Myers-Dean**, Yinan Zhao, Brian Price, Scott Cohen, Danna Gurari. *Under Review*
- Haley A. Wofford†, **Josh Myers-Dean**†, Brandon A. Vogel, Kevin Alexander Estrada Alamo, Frederick A. Longshore-Neate, Filip Jagodzinski, and Jeanine F. Amacher. Domain analysis and motif matcher (damm): A program to predict selectivity determinants in monosiga brevicollis pdz domains using human pdz data. *Molecules*, 26(19), 2021. Project Page
- David H. Smith, Qiang Hao, Christopher D. Hundhausen, Filip Jagodzinski, **Josh Myers-Dean**, and Kira Jaeger. Towards modeling student engagement with interactive computing textbooks: An empirical study. In *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education*, SIGCSE '21, page 914–920, New York, NY, USA, 2021. Association for Computing Machinery
- **Josh Myers-Dean** and Scott Wehrwein. Semantic pixel distances for image editing. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, June 2020. *Accepted for oral presentation* Project Page
- Sam Herr†, **Josh Myers-Dean**†, Hunter Read†, and Filip Jagodzinski. Petra: Drug engineering via rigidity analysis. *Molecules*, 25(6):1304, Mar 2020

Awards

- NSF Graduate Research Fellowship Program: Proposal Title: *Spatio-Temporal Feature Matching for Time-Varying Structure from Motion* 2021-2026
- Early Career Professional Development Fellowship: CU Boulder Computer Science - 2021
- James Lee Johnson Memorial Endowment: Western Washington University Computer Science - 2020
- Tuition Reimbursement: Pacific Northwest National Laboratory - 2020
- 1^{st} Place - Biosurveillance Mobile App. Dev. Competition: Pacific Northwest National Laboratory - 2020
- Federal Pell Grant: 2015-2021

Presentations

- Giving Context: Entity Classification from a Single Name: August 2021, PNNL Virtual Research Symposium
- Robust Entity Tagging in the Wild: December 2020, PNNL Virtual Research Symposium
- Semantic Pixel Distances for Image Editing: June 2020, CVPR NTIRE. Video
- Bash: Fall 2019, Materials

- Machine Learning: Fall 2019, Winter 2020, Materials
- API: Winter 2020, Materials

Outreach

- Teen Science Cafe Program Page
- CU Boulder PhD Application Mentoring Program Page
- WWU Computer Science Peer Tutor Program Page
- Sunnyland Elementary School "Hour of Code" Program Page

Technical Skills

- **Languages**: Golang, Python, Javascript, C#, C, MySQL, Java, R, Shell, Julia, LaTeX
- **Technologies & Frameworks**: Databricks, Docker, Git, WandB, PySpark, Linux, AWS S3, Azure Virtual Machines, PyTorch, Numpy, OpenCV, Pandas, ReactJS, Git, Hugging Face Transformers, Jax, Detectron

Relevant Courses

- Deep Learning, Computer Vision, Computer Graphics, Advances in Computer Vision, Statistical Methods, Multivariable Calculus, Numerical Computation, Data Driven Modeling