Elisa Warner, PhD

elisawa@umich.edu +1 (734) 244-2770
Ann Arbor, MI
https://www.linkedin.com/in/elisa-warner/

SUMMARY

PhD graduate in Bioinformatics with 8 years of scientific training and over 11 years experience in coding, including 9 years with Python, and 6 years of scientific studies applying custom AI/ML algorithms to biomedical data. Specialized in multimodal ML applications for diagnostic/prognostic outcomes.

EDUCATION

University of Michigan, Ann Arbor, MI

- **Doctor of Philosophy (early 2024 *projected*),** Bioinformatics
- **Master of Science (2020),** Bioinformatics
- **Master of Public Health w. Certificate in Health Informatics (2017),** Molecular Epidemiology
- **Bachelor of Science w. Distinction and High Honors (2015),** *Pre-medicine track*

HIGHLIGHTED SKILLS

Programming language fluencies: **Python**, **Matlab**, **SQL**, **R**, **SAS, C, Java, HTML, C++, Julia;**
Python packages: **scipy, pandas, numpy, Pillow, pickle, openslide, slideio, OpenCV, matplotlib;**
Machine learning fluencies: **PyTorch, Keras, Tensorflow, scikit-learn, torchvision;**
Training/Experience in **linear algebra, multivariate calculus, causal inference, biostatistics, algorithms**

RESEARCH/INDUSTRY EXPERIENCE

Machine Learning Research Intern, Genentech Inc., South San Francisco, CA — Sept 2022 - July 2023

Medical-Language-Processing & AI team. ***(R and Python)***

- Leveraged cutting-edge deep learning methodologies to derive biological insights, focusing on RNA-seq translation from histology slides via computer vision.
- Normalized and created gene signatures from Seurat files. Develop models with PyTorch to predict RNA expression in histological tissue. **Led to authorship on at least one paper**
- Optimized image processing workflows by refactoring data preprocessing steps and redesigning the Dataset class. **This increased the speed from which the model processed data by 100x.**

Graduate Student Research Assistant, University of Michigan, Ann Arbor, MI — July 2018 - Present

- Signal & Imaging Bioinformatics Lab. **Applied computer vision and machine learning to medical images such as histopathology slides, MRI and CT for clinical decision assistance.** ***(R, Python, Matlab)***
- Published **18 academic works** by graduation (most involving statistical and ML methods), accruing over **300 citations**. THESIS FOCUS: **Multimodal learning applications.** Submitted a review on multimodal learning (under peer review), designed a low-parameter multimodal fusion model for MRI and a privileged learning model using Random Forest.
- Developed statistical/machine learning algorithms for predictive disease modeling that were presented as **full publications in three prestigious engineering conferences.**

Data Engineer, Elevada (start-up), Detroit, MI — July 2017 - June 2018

- Authored data mining scripts leveraging REST APIs and web scraping, resulting in captivating demos that would draw in new customers. Implemented data obfuscation scripts to protect source data used in demos. ***(Python)***
- **Track record of excellent communication skills.** Presented at a company booth at the TriCon Molecular conference to promote the product. Also communicated directly with customers to get feedback on how to improve our software.

Research Intern, Forschungszentrum Jülich, NRW, Germany — May 2016 - July 2016

- Created a statistical algorithm for biological age using ***Python and SAS***. The algorithm was co-opted by David Sinclair's team at Harvard Medical School and published in ***Nature Communications***

SELECTED PUBLICATIONS

1. **Predicting osteoarthritis of the temporomandibular joint using random forest with privileged information.** Warner, E., et al, *2022 MICCAI Workshop on Multimodal Learning and Fusion Across Scales for Clinical Decision Support*. vol. 13755, pp. 77–86 (2022)
2. **Low-parameter supervised learning models can discriminate pseudoprogression and true progression in non-perfusion-based MRI.** Warner, E., et al, 2023 *45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*
3. **Meaningful incorporation of artificial intelligence for personalized patient management during cancer: Quantitative imaging, risk assessment, and therapeutic outcomes.** Warner, E., et al, *Artificial Intelligence in Medicine*, pp. 339–359, Academic Press, 2020
4. **Multimodal Machine Learning in Image-Based and Clinical Biomedicine: Survey and Prospects.** Warner, E., et al. (*submitted*), 2023
5. **Investigating useful features for overall survival prediction in patients with low-grade glioma using histology slides.** Warner, E., et al, 2022 *44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, pp. 4938–4941, IEEE, 2022