Zachary Petroff

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Education

PHD | AUGUST 2024 - PRESENT | INDIANA UNIVERSITY

· Majors: Computer Science & Cognitive Science

MASTER OF SCIENCE | AUGUST 2021 - DECEMBER 2022 | INDIANA UNIVERSITY

· Major: Data Science
· GPA: 3.8
· Related coursework: Deep Learning Systems, Computer Vision, Elements of Artificial Intelligence

BACHELOR OF SCIENCE | AUGUST 2017 - MAY 2021 | INDIANA UNIVERSITY

· Major: Cognitive Science
· GPA: 3.5
· Related coursework: Neural Networks and the Brain, Principles of Machine Learning, Data Analysis and Mining

Experience

RESEARCH ASSOCIATE (FULL-TIME) | INDIANA UNIVERSITY | JULY 2023 - PRESENT

· Responsibilities:
    · Utilize advanced deep learning techniques to analyze and understand three dimensional scenes, employing tools such as Python, Pytorch, Hugging Face, and SLURM.
    · Design and create a graphical user interface (GUI) for the annotation of various types of eye movements, using programming languages and frameworks like Python, MATLAB, and Tkinter.
    · Apply image processing methods to assess spatial Root Mean Square (RMS) contrast in relation to eye position and conduct statistical analysis to investigate potential significant changes associated with development.

RESEARCH ASSOCIATE (PART-TIME) | INDIANA UNIVERSITY | MAY 2022 – JULY 2023

· Responsibilities:
    · Create and implement a deep learning-based algorithm to accurately capture purposeful head movements from first-person video footage, incorporating computer vision and time-series analysis techniques, utilizing Python, Pytorch, CUDA, and SLURM.
    · Employ parallel computing strategies for the rapid computation of image statistics across a vast dataset of over 43 million images, leveraging tools such as Python and SLURM.

Conference Presentations

· "The Statistics of Infants' Natural Visual Experience are Shaped by Motor Development" Vision Sciences Society Annual Meeting. St. Petersburg, Florida, May 2023.
· "Characterizing the Statistics of Naturalistic Visual Experience During Head-Free Fixations in Infancy" Vision Sciences Society Annual Meeting. St. Petersburg, Florida, May 2023.

Technical Skills

· **Languages**: Python, MATLAB, R, SQL, Java.
· **Big Data and Machine Learning**: Python (e.g., Scikit-Learn, TensorFlow, Keras, PyTorch, Pandas, Numpy), R, Jupyter, SQL, Spark, Support Vector Machines, K-Nearest Neighbors, Decision Trees, Hidden Markov Models, Naive Bayes, Genetic Algorithms, Computer Vision, Deep Learning, Regression, Classification, Clustering, Time-series Analysis.
· **Data Science & Miscellaneous Skills**: Data Science Pipeline (cleansing, wrangling, visualization, modeling, interpretation), Statistics, Object-Oriented Programming.