SHANTANU GHOSH

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Hiring Manager
MosiacML

Dear Hiring Manager,

I am writing to express my interest in the 2023 Research Scientist Intern position for Summer, 2023 at MosiacML. I am currently a 2^{nd} year Ph.D. student in Electrical Engineering at Boston University under the supervision of Dr. Kayhan Batmanghelich. Prior to that, I graduated with a Master's degree in Computer Science from the University of Florida. My research interests lie in medical vision, deep learning, and causal inference. I am particularly interested in developing explainable AI algorithms to (1) understand the rich internal structure of a blackbox model, (2) improve the reasoning methodology in terms of high-level interpretable concepts in an image, (3) bridge the gap between post-hoc explainability and interpretable by design methods.

Initially, I leveraged the anatomical landmarks (weak labels) from the **Stanford RadGraph NLP pipleline** to create an attention-driven algorithm to localize Pneumonia and Pneumothorax from **MIMIC-CXR** dataset. Later I devised a novel algorithm to extract an interpretable model from a trained blackbox iteratively to explain samples locally. We also provide basic reasoning by explaining the prediction using first-order logic (FOL) statements. These FOL explanations assist us in comprehending how the interpretable model composes the different concepts to classify a given sample to engender trust in AI models. Also, before that, we investigated the explainability of the "Lottery Ticket Hypothesis". Specifically, we evaluate the pruned networks from LTH against a complex dataset, CUB-200. Also, we study the explainability of the pruned networks in terms of both pixels and high-level concepts using GRAD-CAM and TCAV to compute the local and global explanations, respectively. We also plan to extend this analysis to the real-world chest x-ray dataset - MIMIC-CXR.

Previously, I worked as a graduate assistant under the supervision of Dr. Mattia Prosperi in the Department of Epidemiology, conducting research in Causal Inference. Also, I have a solid experience of 6.5 years of experience in software development across two multinational companies, Lexmark and Cognizant. With this internship, I want to explore how to scale up pruning in a real-life setting. Also I have extensive experience in vision, where as I want to explore pruing for NLP in terms of explainability.

Thank you for your consideration. Please feel free to contact me at (352)871-3965 or shawn24@bu.edu.

Regards,

Shantanu Ghosh