SHANTANU GHOSH

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Dear Recruitment Team,

I am writing to express my interest in the Research Scientist Intern position at your company for Summer, 2025, where I can leverage my expertise in vision-language models, explainable AI, and deep learning to contribute to your team. As a PhD candidate in Electrical Engineering at Boston University, I have developed strong research experience in AI, focusing on solving real-world challenges in computer vision, medical imaging, and robust representation learning.

Most recently, I worked on Mammo-CLIP, the first vision-language model pre-trained on a large dataset of screening mammogram-report pairs. Published in MICCAI 2024 (top 11%), this model demonstrates state-of-the-art performance in classifying and localizing key mammographic attributes critical to breast cancer detection, offering robustness and data efficiency. Additionally, I developed Mammo-FActOR, a feature attribution method providing spatial interpretation at a sentence-level granularity within mammography reports, making the model's predictions more interpretable for clinicians. Additionally, I worked on LADDER: Language-Driven Slice Discovery and Error Rectification, which aligns model representations with language features to identify and correct errors in image classification without the need for external attribute annotations. Currently under review, this work advances explainability and robustness across multiple datasets. During my recent internship at Amazon AWS, I addressed challenges in learning robust representations for tabular data in self-supervised models, enhancing model robustness across error slices. The results are currently under review for both publication and patent.

Early on, I utilized anatomical landmarks (weak labels) from the Stanford RadGraph to develop an attention-driven algorithm to localize a disease in the MIMIC-CXR dataset. Later, I utilized the weak labels to carve out a mixture of interpretable models (experts), a Blackbox model, with each interpretable expert specializing in a subset of samples and explaining them through First Order Logic (FOL). This method effectively eliminated the issue of shortcut learning and identified domain-invariant anatomical concepts, mirroring radiologists' diagnostic rules. These contributions have been presented at top-tier conferences such as ICML and MICCAI and journals such as Radiology: AI.

Prior to my PhD, I worked under Dr. Mattia Prosperi at the University of Florida, focusing on the application of deep learning for propensity score matching. My master's research has been published in leading venues such as AMIA and JAMIA.

I have always been passionate about the model representation and reasoning of large AI models deployed in real-life applications. My unique background makes me a good fit for a research position in your company. I look forward to hearing from you.

Regards,

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