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 Ph.D. 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 develop Mammo-CLIP, the first vision-language model trained on a limited dataset of screening mammogram-report pairs. We augment the model with an image-label dataset to address data scarcity. 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. Also, I devise Mammo-FActOR, a feature attribution method providing spatial interpretation at a sentence-level granularity within mammography reports, enabling weakly supervised detection of mammographic attributes without ground truth bounding boxes, thereby enhancing interpretability for clinicians. Currently, I am working on LADDER, which aligns the classifier's representations with language embeddings to identify the failure modes of a classifier without external attribute annotations. Currently under review, this work advances explainability and robustness across multiple datasets. During my recent internship at Amazon, I address challenges in learning robust representations for tabular data in self-supervised models. The results are published at the Table Representation workshop @NeurIPS 2024 and currently under review for patent.

Earlier, I utilize 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 utilize the weak labels to carve out a mixture of interpretable models (experts) from a Blackbox classifier, with each interpretable expert specializing in a subset of samples and explaining them through First Order Logic (FOL). This method effectively eliminates the issue of shortcuts and identifies domain-invariant anatomical concepts, mirroring radiologists' diagnostic rules. These contributions have been presented at top-tier conferences such as ICML and MICCAI (top 15%) and journals such as Radiology: AI.

During my Masters at UF, I worked under Dr. Mattia Prosperi at the University of Florida, focusing on applying 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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