



AnnotationBridge: Student Volunteers for Medical Image Annotation

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Briefly describe what attendees will see during your demo.

Attendees will see a live demonstration of AnnotationBridge from both the researcher and volunteer perspectives. The demo will show a researcher uploading a medical imaging dataset, assigning annotation tasks, and reviewing completed segmentations. On the volunteer side, attendees will see the training module, qualification process, annotation interface, automated quality checks, and how expert review produces research-ready annotations while tracking volunteer contributions and impact.

Problem & Motivation: What clinical or operational problem does your MVP address?

While working in a biomedical imaging research lab, I spent hours performing OCT image segmentation alongside my mentor. Although the work was essential for developing medical artificial intelligence models, it was highly repetitive and time-consuming. I was struck by the fact that my mentor, an accomplished researcher with deep expertise, still had to spend a significant portion of their time manually tracing anatomical structures instead of designing experiments, analyzing results, or advancing new ideas. That experience led me to ask whether trained volunteers, supported by robust quality control and expert review, could complete many of these repetitive annotation tasks, allowing researchers to focus on the work that truly requires their expertise. AnnotationBridge was created to address this bottleneck by connecting trained student volunteers with research labs to accelerate the creation of high-quality medical imaging datasets.

What You Built: Describe your MVP, tool, or workflow in plain language

AnnotationBridge is a nonprofit web platform that connects medical imaging researchers with trained student volunteers to assist with image annotation. Researchers can upload datasets, assign annotation tasks, and review completed work through a centralized dashboard. Volunteers complete interactive training, pass qualification tests, and annotate small, well-defined tasks using a browser-based interface. The platform incorporates quality-control measures, including benchmark images, multiple independent annotations, automated validation, and expert review, to help ensure research-quality labels while reducing the amount of repetitive manual work required from researchers.

Tech Stack & Development Approach: What tools, frameworks, or methods did you use to build it?

AnnotationBridge was built using Next.js 16, React 19, TypeScript, and Tailwind CSS. After developing the platform's system architecture and technical requirements, I used an AI-assisted development process to accelerate implementation and build the initial product. For the MVP, I selected Supabase to provide authentication, PostgreSQL database infrastructure, file storage, and role-based access control. This allowed me to prototype and iterate quickly while maintaining a structured and secure foundation. As the platform grows beyond the MVP stage, I plan to migrate the backend to AWS.

Validation & Evidence: Have you done any informal testing or validation? If so, what did you find?

We have conducted informal validation through customer discovery, reaching out to hundreds of professors and researchers at universities and medical research institutions across the United States. Although response rates have been limited, the conversations we have had have helped us refine the platform's workflow, quality-control processes, and understanding of researcher needs. The feedback has been encouraging. Several researchers expressed interest in the concept, and one professor specifically recommended that we apply to this conference. These discussions also confirmed that annotation backlogs are a common challenge and emphasized the importance of building trust through rigorous annotator training, task-specific validation, and expert review before scaling the platform. Our approach is also supported by published research showing that, for certain annotation tasks, non-experts with appropriate training can achieve performance comparable to that of domain experts, even without prior subject-matter knowledge. To date, we have presented the concept to a Johns Hopkins University research group and received feedback from professors through direct outreach. While these early conversations have meaningfully shaped our direction, we have not yet completed formal testing at scale. We are attending this conference to gather broader feedback, validate our assumptions with a larger group of researchers, and identify opportunities to strengthen the platform before further development.

What specific feedback, help, or collaboration are you hoping to get from the CAIMI26 community?

We are looking for feedback from researchers and clinicians on whether our workflow is practical for real-world research settings, particularly which annotation tasks are appropriate for trained volunteers and what quality standards would be required before they would trust volunteer-generated labels. We also hope to connect with research labs interested in piloting the platform, as well as experts in medical imaging, clinical AI, and data governance who can advise on privacy, workflow integration, and scaling the platform responsibly. Ultimately, we want to ensure AnnotationBridge solves a genuine need while meeting the standards required for research-quality datasets.

Known Limitations & Honest Failures: What isn't working yet, or what have you already tried that failed?

The largest challenge is data privacy and regulatory compliance. Many medical imaging datasets contain protected health information or require strict institutional approvals, making it difficult to provide volunteer access outside of a research institution. We are actively exploring workflows that use fully de-identified data, institution-approved data-sharing agreements, and secure access controls, but identifying datasets that satisfy both privacy requirements and research needs remains a significant hurdle. We are also exploring options to encrypt university data in a manner where volunteers are unable to. Building trust with research institutions will require demonstrating not only annotation quality but also robust security, governance, and compliance practices before the platform can be adopted at scale.

Potential for Impact: If this MVP were fully developed and deployed, who would benefit and how?

If successfully deployed, AnnotationBridge could benefit both medical researchers and aspiring STEM students. Researchers would spend less time on repetitive image annotation and more time designing studies, analyzing results, and developing new medical artificial intelligence models. Students would gain meaningful, hands-on experience contributing to real biomedical research while earning verified volunteer hours and exploring careers in medicine, computer science, and biomedical engineering. By reducing one of the major bottlenecks in creating high-quality medical imaging datasets, the platform has the potential to accelerate the development of more accurate and robust medical AI systems that ultimately improve patient care.

GitHub Repo:

https://docs.google.com/presentation/d/1UXei8rZIBuegtSCgl2UnvE1_egodfDx_YRERsZLIY-A/edit?usp=sharing