Assistant Research Engineer - Full-Stack Web & Mobile Development

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Type: Full-Time
Salary: $60,000 - $70,000 per year
Posted: 19 days ago
Application Due: Open Until Filled
Category: Software Engineer/Programmer

JOHNS HOPKINS UNIVERSITY

The Johns Hopkins Whiting School of Engineering and the Center for Bioengineering Innovation and Design are seeking a motivated Assistant Research Engineer to join our dynamic team. The Assistant Research Engineer will support the research, development, and deployment of the VectorCam platform, an AI-enabled vector surveillance system funded by the Gates Foundation. Following the successful completion of a one-year randomized controlled trial, VectorCam is now scaling across multiple countries in Africa, Latin America, and Asia. The engineer will play a central role in expanding the VectorCam web application by designing new features, customizing workflows for country programs, and implementing feature flags that support rapid and reliable multi-country deployments.

The role operates in a fast-paced Agile development environment and involves close collaboration with the Software Lead, global research partners, and the Johns Hopkins University team. The ideal candidate is a mission-driven software engineer who enjoys solving complex workflow problems, iterating quickly based on user feedback, and building dependable systems for real-world global health applications.

While the primary focus is on the web application, there are opportunities to contribute across mobile development, backend services, and cloud infrastructure for candidates with relevant interest or experience. The successful candidate will take ownership of technical decisions and help scale VectorCam across Uganda, Kenya, Ghana, Colombia, and additional countries as national programs adopt the tool.

A. Software Architecture and System Design

- Participate in architectural planning for new features and platform components
- Design systems that are modular, maintainable, testable, and scalable
- Define clear boundaries between data, domain logic, and presentation layers
- Contribute to long-term roadmap decisions involving multi-country deployments
- Produce technical documentation and architectural specifications

B. Web Application Engineering (Full Stack)

- Develop scalable, high-quality web applications using modern frameworks (Next.js, React, TypeScript) and the Backend for Frontend (BFF) design pattern
- Build server-side logic for data access, authentication, and role-based authorization
- Integrate with REST APIs and design well-structured API consumption layers
- Implement responsive UI components, dashboards, data tables, and workflow-driven interfaces
- Optimize performance, caching, bundling, and load times for real-world bandwidth constraints
- Ensure clean code structure through modularization, shared utilities, and reusable components
- Maintain high standards in security, data handling, and error recovery for production web systems

C. Android Application Engineering

- Design and develop modern Android applications using Kotlin and Jetpack Compose
- Build clean UI/component architecture and state management patterns
- Ensure the app works reliably in offline/low-connectivity settings
- Integrate with backend APIs using clean domain/data models
- Maintain high levels of performance on mid-range Android devices
- Debug concurrency issues, lifecycle edge cases, and memory/performance challenge

D. DevOps, CI/CD, and Infrastructure

- Manage cloud infrastructure (AWS preferred), including compute, storage, databases, and CDN
- Implement and maintain CI/CD pipelines for web and mobile deployments
- Configure multi-environment deployments (development, staging, production, per-country variants)
- Set up monitoring, logging, observability, and alerting systems for production reliability
- Troubleshoot infrastructure issues and participate in incident response
- Optimize deployments for multiple countries in terms of performance, reliability, and cost

E. Multi-Country Deployment & Scalability

- Build systems that can be configured per country, program, or workflow
- Design a flexible architecture that accommodates localization, data segregation, and regulatory differences

- Collaborate with global partners to understand local technical constraints

F. Integration with the VectorCam Ecosystem
- Collaborate with mobile engineers, data scientists, and hardware teams.
- Integrate with backend APIs and support development of clean data models.
- Contribute to QA, troubleshooting, and field deployment readiness.

G. Research, Dissemination & Global Impact
- Contribute to reports, manuscripts, and technical presentations.
- Support operational research evaluating usability and digital adoption.
- Participate in conversations about scale-up strategy, interoperability (e.g., DHIS2), and data governance.

Qualifications

Bachelors, Masters or Ph.D. in related field.

General Engineering

- Strong software engineering fundamentals (architecture, design patterns, debugging)
- Ability to design end-to-end systems across multiple layers of the stack
- Experience working in small teams, high-ownership environments, agile development

Web Development
- Strong experience with TypeScript, React, Next.js
- Understanding of server-side rendering, routing, API integration, and client/server separation
- Experience building data-driven web dashboards

Android Development
- Strong experience with Kotlin and Jetpack Compose
- Experience with state management, coroutines, and lifecycle-aware patterns
- Knowledge of Room, Dependency Injection, DataStore, WorkManager, and app architecture best practices

DevOps/Cloud
- Experience with AWS or similar cloud providers
- Experience with Docker and CI/CD pipelines
- Experience setting up multi-environment deployments for web and mobile development

Other Skills
- Excellent communication skills and willingness to work across disciplines
- Strong ownership and initiative
- Ability to adapt quickly and learn new technologies as needed

- Comfort interacting with global partners and field teams

Preferred Skills (Not Required but Highly Desirable)

- Experience with edge AI, TensorFlow Lite, or mobile inference
- Experience in digital health or public-sector deployments
- Experience in low-bandwidth or offline-first system design
- Understanding of DHIS2, healthcare data, or government tech infrastructure
- Experience with observability tools (Sentry, PostHog, CloudWatch)

Application Instructions

Why Work on our Team

VectorCam is at a pivotal moment. In only three years, our team has moved from early concept to a completed randomized controlled trial, Gates Foundation support, and multi-country implementation starting across Africa, Latin America, and India. We have proven that it is possible to replace decades-old manual surveillance with fast, digital, AI-enabled tools that give governments a clearer view of their disease landscape.

You will join a team that believes global health systems can be redesigned through thoughtful engineering and strong partnerships. Many countries still rely on fragmented vector surveillance systems that slow decision-making and limit impact. We are building a new foundation that empowers frontline health workers, strengthens national programs, and creates a world where vector-borne diseases are fought with modern tools rather than outdated processes.

Here, your work will matter immediately. A feature you design may change how a Ministry of Health allocates resources. A workflow you build may determine how fast an outbreak signal is detected. You will collaborate with government partners, researchers, and engineers who bring intense ambition and purpose to this mission. If you want to be part of a team that is rewriting what is possible in global public health, this is the right place to grow.

Upload your CV and apply today!

Salary Range: $60,000 - $70,000
The listed salary range represents the minimum and maximum Johns Hopkins University offers for this position, based on a good faith estimate at the time of posting. Actual compensation will vary depending on factors such as location, skills, experience, market conditions, education, and internal equity. Not all candidates will qualify for the highest salary in the range. Johns Hopkins provides a comprehensive benefits package supporting health, career, and retirement. Learn more: https://hr.jhu.edu/benefits-worklife/. Equal Opportunity Employer
All qualified applicants will receive consideration for employment without regard to race,

color, religion, sex, sexual orientation, gender identity, national origin, disability, or status as a protected veteran. EEO is the Law https://www.eeoc.gov/sites/default/files/2023-06/22-088_EEOC_KnowYourRights6.12ScreenRdr.pdf