

# STEPHEN KIIYURU

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## SOFTWARE ENGINEER

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Software engineer with 6+ years of experience delivering reliable, accessible, and performance-focused web applications. Core strengths lie in front-end development with React and Astro, complemented by backend engineering using Node.js and PostgreSQL, including experience designing serverless systems, building real-time APIs, and integrating AI to solve real-world problems. Demonstrates a strong interest in 3D experiences on the web, creating expressive, interactive applications using Three.js. Currently pursuing a Master's in Artificial Intelligence Systems at the University of Trento, Italy.

Beyond engineering, has co-founded and led teams at two organizations, driving technical strategy, mentoring developers, and scaling STEM education programs that have reached learners across Kenya.

## EXPERIENCE

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### DISCOVERY LABS – Nairobi, Kenya

Lead Software Engineer

Nov 2021 – Present

Web developer

Jan 2018 – Oct 2021

- Events registration web app - <https://app.thediscoverycentre.co.ke>
  - Architected a serverless backend with Next.js and Neon, optimized for sporadic traffic patterns, reducing infrastructure costs by 70%.
  - Engineered real-time messaging using Redis subscriptions to synchronize M-PESA payment events across Next.js server actions, enabling instant transaction verification.
  - Implemented composite indexes and schema-level optimizations in PostgreSQL, reducing query response times by 60% during peak registration periods.
- Website redesign – <https://imla.io>
  - Re-architected the marketing website using Astro, decoupling it from a legacy Laravel + React dashboard to significantly boost site performance and enhance long-term maintainability.
  - Elevated site accessibility to meet WCAG standards by implementing semantic HTML, ARIA roles, and full keyboard navigation, ensuring an inclusive and equitable experience for all users.
  - implemented a lightweight, user-friendly blog CMS using KeyStatic, which empowered the marketing team with content autonomy and resulted in a 200% boost in LinkedIn engagement from consistent blog updates.
- Transcription web application – <https://app.imla.io>
  - Led the development of an AI-powered transcription application, increasing transcription accuracy by over 70% by reducing errors from an average of 7 to 2 per 100 words.
  - Customized a Slate.js-based open-source transcript editor to meet client needs, delivering tailored functionality and export features that drove a 105% increase in monthly usage (from 17 to 35 average transcriptions).
  - Integrated an AI assistant powered by OpenAI's GPT-4 to generate summaries and extract insights from transcripts, improving research efficiency and contributing to a 41% increase in monthly user retention.
- Other key achievements:
  - Directed structured learning sessions and code reviews to upskill a team of 3 engineers, improving code quality and reducing bug reports from 10 per sprint to 6.
  - Implemented CI/CD pipelines using GitHub Actions to streamline deployment, reducing deployment times by 90%.
  - Improved application infrastructure by containerizing Node.js services with Docker and implementing Nginx as a reverse proxy, creating a scalable foundation prepared for high-traffic scenarios.
  - Streamlined systems reliability by introducing error monitoring with Sentry, cutting monthly user-reported issues by 50%.

## EDUCATION

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### DAYSTAR UNIVERSITY – NAIROBI, KENYA

Dec 2016

Bachelor of Engineering, Computer Science; Cumulative GPA: 3.6/4.0

Summa Cum Laude with Honors; Dean's List (2016)

UNIVERSITÀ DI TRENTO – TRENTO, ITALY  
Master's Degree in Artificial Intelligence Systems  
Expected Graduation: July, 2027

## LEADERSHIP

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### THE DISCOVERY CENTRE - Nairobi, Kenya

Co-Founder

Feb 2017 – Present

- Negotiated partnerships with 15 primary and secondary schools to integrate STEM into their curriculum, expanding the reach of STEM education.
- Guided a team of 12 educators to design interactive STEM curriculums, enhancing engagement for young learners.
- Spearheaded the development of quality assurance strategies in use by the content delivery team, resulting in 90% retention of clients year on year.

## PROJECTS

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### PERSONAL PORFOLIO – <https://kiiyurus.space>

- Developed an immersive 3D portfolio using Astro.js and Three.js, leveraging static site generation to improve page load times and user experience, evidenced by a 95+ Lighthouse score and sub-100ms Time to Interactive.
- Engineered an advanced particle system with custom shader-based animations, including dynamic firework effects with 400-1400 particles per instance and optimized WebGL rendering that maintained smooth 60+ Frames Per Second (FPS) performance across devices.
- Implemented a Content Security Policy (CSP) with granular control over resource loading, achieving 100% protection against Cross-Site Scripting (XSS) attacks while maintaining compatibility with modern analytics tools and third-party services.

### BATTLE ON AIR – <https://www.battleonair.com>

- Enhanced developer onboarding experience by improving project documentation, resulting in 2x faster setup times and clearer understanding of the codebase architecture for new team members.
- Engineered a scalable backend system using Convex for managing user coins, implementing secure transaction logging, position tracking, and automated reward distribution for top-performing players in competitive battles.
- Implemented a gamified rewards system with React and Framer Motion, introducing animated rewards and a real-time leaderboard that increased average daily players by over 65% (from 34 to 57).

## SKILLS

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**Technical:** JavaScript, TypeScript, Python, HTML/CSS, React, Next.js, Astro, Node.js, Express.js, WebGL, Three.js, GLSL Shaders, GraphQL, REST, Vitest, Playwright, Git, Docker, Github Actions, PostgreSQL, SQLite, Redis

**Languages:** Fluent in English; Conversational Proficiency in Italian