

# Ben Phillips

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## EDUCATION

### University of Kansas

May 2026

Engineering Physics B.S. with focus in Computer Engineering  
Minor in Film and Media, Honors student, Tau Beta Pi member, 3.99 GPA

## SKILLS

**Languages:** Rust, C / C++, Python, Java, Kotlin, JavaScript, GLSL, VHDL, x64 Assembly,  $\LaTeX$   
**Frameworks:** Git, OpenGL, Linux, Android Studio, Jetpack Compose, ReactJS, JIRA, GitHub Copilot

## WORK EXPERIENCE

### Garmin

May – August 2025

Software Engineering Intern

*Application Architecture, Tools Design, Python, Qt*

- Designed a new app architecture for a data analysis algorithm development tool with 10,000 line impact
- Added new graphical interaction systems, undo and redo, app session save files, an animation system, and data units tracking, while decreasing total code volume
- Refactored app repo to centralize state management, separate front and back ends, and use type checking
- Developed analytical models for fitness device sensor features, using Fourier analysis for PDE solutions

### KUARQ Computing Research Group

May 2024 – May 2025

Research Assistant

*Embedded Development, Quantum Computing, Technical Communication*

- Lead a project to develop quantum circuit simulators for Cerebras Wafer-Scale Engine (WSE)
- Implemented, profiled, and optimized algorithms for unique dataflow architecture
- Published and presented a poster as first author at Supercomputing 2024
- Designed curriculum for and helped teach a quantum computing camp for high-schoolers

### KU Ovchinnikov Lab

November 2022 – January 2024

Research Assistant

*Mathematical Model Development, Visualization Tools, Reverse Engineering, Rust*

- Developed a graphical visualization tool for Moiré patterns to predict material properties
- Reverse-engineered device communication protocols to plot and log data from an electron microscope

### Cerner

February – May 2021

Software Engineering Intern

*Java, ReactJS, SQL*

- Implemented test query system for data compliance-checking
- Developed on React front-end user interface and Java back-end database logic

## PROJECTS

### GISP Recon Camera

January – August 2025

Low-Power Imaging Embedded System

*Real-time Embedded Systems, C++, CAD, Rust*

- Designed and constructed a three-camera capture device using embedded C++
- Programmed DMA (Direct Memory Access) to efficiently capture and multiplex real-time video signals
- Created an operational device optimized for strict space, power, and budget constraints

### Published Open-Source Minecraft Mod

2021 – Present

Cool Elytra Roll

*Open-Source Collaboration, Physics Simulation, Software Maintenance, Java*

- Added physics-based camera rotation to flight using matrix transformations
- Continuously maintained codebase and released updates, managing contributors' pull requests
- Over 170,000 downloads across multiple publishing platforms

## Rock Chalk Rendezvous

February – May 2024

RESTful Calendar Coordination Platform

*Software Development Lifecycle, Specification, Documentation, Testing, REST APIs, C++*

- Technical lead for a team of 5
- Applied design standards to implement features from Outlook and When2Meet
- Created design documents and test procedures to verify product requirements and secure user data

## Wikidungeon

April 2023

1st Place HackKU Web Navigation Game

*Data-driven Algorithms, Procedural Generation, Python*

- Lead a team of 3 to build a novel game engine
- Combined parsing with layout algorithms to procedurally generate levels from wiki content & link topology
- Finished result in 36 hours, presenting to event judges and winning first prize

## CLIC Handheld Camera

January – May 2025

Senior Capstone Project

*Embedded Linux, Firmware, Hardware Integration, C, OpenGL ES, V4L2*

- Created a consumer-grade digital camera with a cross-functional engineering team of 4
- System firmware lead on an embedded Linux platform, calling system drivers for capture, input, and display
- Coordinated IO resources with electrical design to support a display, SDIO storage, USB, and buttons

## IR Wireless Communication System

August – October 2024

Academic Project

*Embedded Development, Error Correction Algorithms, C++*

- Developed firmware for Arduino-based transmitter and receiver pair using infrared LEDs and photodiodes
- Implemented Reed-Solomon error correction and adaptive sensitivity for high reliability
- Transmitted messages reliably over a 12 meter distance at 2.4Kb/s bitrate

## NFCLanders

September 2025 – Present

Android App

*Tools Design, UI/UX, Android Studio, Jetpack Compose, Kotlin*

- Created an Android app to read, edit, and write NFC tag data
- Synthesized many documentation sources into a coherent system of data structures
- Designed user interface to minimize data loss risk and communicate details of read/write errors

## Fizzy Engine

2024 – Present

Physics-Based Game Engine

*Physics Simulation, Computer Graphics, Rust, OpenGL, WebGPU*

- Designed a threaded engine architecture with separate input, graphics, physics, and generator threads
- Implemented and optimized a complex, robust collision algorithm for physics objects
- Modeled flexible terrain geometry with procedural meshing and texture mapping

## PUBLICATIONS

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### Towards Scalable Quantum Simulation on Wafer-Scale Engines

Poster

**Phillips, Ben**, Kneidel, D., Nobel, A., & El-Araby, E. (2024). The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC24), Atlanta, Georgia, USA, November 2024.

### An Accurate and Scalable Multidimensional Quantum Solver for Partial Differential Equations

Poster

Chaudhary, M., Islam, I., Nobel, A., Kneidel, D., Jha, V., **Phillips, Ben**, El-Araby, K., Singh, M., & El-Araby, E. (2024). The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC24), Atlanta, Georgia, USA, November 2024. **(Best Research Poster Award Finalist)**

### Solving Multidimensional Partial Differential Equations Using Efficient Quantum Circuits

Journal Article

Chaudhary, M., El-Araby, K., Nobel, A., Jha, V., Kneidel, D., Islam, I., Singh, M., Ogundele, S., **Phillips, Ben**, Egan, K., Thomas, S., Bontrager, D., Kim, S., & El-Araby, E. (2025). *Algorithms* 2025, 18(3), 176, March 2025.

### Quantum Circuit Synthesis Using Fuzzy-Logic-Assisted Genetic Algorithms

Journal Article

Islam, I., Jha, V., Thomas, S., Egan, K., Nobel, A., Kim, S., Chaudhary, M., Ogundele, S., Kneidel, D., **Phillips, Ben**, Singh, M., El-Araby, K., Bontrager, D., & El-Araby, E. (2025). *Algorithms* 2025, Special Issue on Algorithms for Quantum Computing and Quantum-Centric High-Performance Computing, 18(4), 178, March 2025.

**Summer Camp Staff**

2021 – 2023

*Leadership, Management, Communication*

- Lodge lead of client-facing team of 3 to prepare meals and run escape rooms