Ben Phillips

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EDUCATION

2022 - 2026 **Engineering Physics B.S. in Digital Electronics Design** — **University of Kansas**

- Current junior and honors student with 4.0 GPA
- Combination of computer engineering and physics programs
- Working on my senior design capstone project a year early
- Also enrolled in semiconductor physics, signal analysis, electricity and magnetism, and film aesthetics

SKILLS

General Technical Skills

Mathematical Modeling, Digital Hardware Design, Audio & Video Processing, Algorithm Development, CAD, Electron Beam Lithography, Lighting Design

Programming Language Proficiencies

Rust JavaScript CSL GLSL Java
VHDL C/C++ LaTeX HTML Python

WORK EXPERIENCE

5/2024 – Present **Quantum Computing Research** — **KU Advanced Reconfigurable and Quantum (KUARQ) Computing Group**

- Leading a project to develop quantum circuit emulators for Cerebras Wafer-Scale Engine (WSE)
- Learning about and implementing practical algorithms on unique HPC architecture
- Collaborating with Cerebras and Argonne National Lab
- Created, published, and presented a poster at the Supercomputing 2024 (SC24) conference
- Helped write curriculum for and instruct a quantum computing camp for high-schoolers

11/2022 – 1/2024 **2D Materials Research (Condensed Matter Physics)** — **KU Ovchinnikov Lab**

- Developed a Moiré pattern visualization tool and other software utilities for the lab
- Superuser for electrical measurement systems and stereo microscope
- Used a scanning electron microscope to perform EBL (electron beam lithography) on a weekly basis

2021 – 2023 **H. Roe Bartle Summer Camp Staff** — **Scouts BSA - Heart of America Council**

- Worked for 3 summers with children age 10+ and adult leaders
- Lead the escape room lodge in 2023 with two junior staff working under my leadership
- Designed and ran lighting sequences using an ETC board for major campfire ceremonies

PROJECTS

Team Leadership & Software Engineering — **1st Place HackKU 2023 Project: Wikidungeon** — **devpost.com/software/wikidungeon**

- Lead a team of three to win first place in the general track in this 36-hour competition
- Rogue-like game where players navigate Wikipedia by exploring a dungeon
- Relies on networking protocols, text parsing and filtering, probability modeling, procedural object placement, a physics engine, and a graphics pipeline
- Dungeon levels and links to other levels are generated algorithmically from Wiki page contents

Applied Math & Open Source Collaboration — **Published Physics-Based Minecraft Mod** — **www.curseforge.com/minecraft/mc-mods/cool-elytra-roll**

- Developed and published a mod to add realistic camera movement
- Changes the controls for the game's flight system by calculating and injecting transformation matrices
- Have maintained and updated the mod for 4 years with the help of other contributors
- Over 110,000 downloads across mod hosting sites Curseforge and Modrinth

Application Architecture & Documentation — **Rock Chalk Rendezvous - Desktop Calendar Application** — **github.com/delster1/RockChalkRendezvous**

- Technical lead in team of 5 for software engineering semester project
- Client-server REST API architecture combines features from Outlook and When2Meet
- Used data serialization design patterns for networking and storage

CONFERENCE PUBLICATIONS

SC24 Research Poster — **Towards Scalable Quantum Simulation on Wafer-Scale Engines**

- **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.

SC24 Research Poster — **An Accurate and Scalable Multidimensional Quantum Solver for Partial Differential Equations**

- 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**)