



Design and Development of a Portable Stereoscopic Wigglegram Camera

This project details the design and development of one of the world's first portable digital wigglegram cameras. By simultaneously capturing a scene using four independent camera modules then precisely aligning the frames digitally, the device creates a unique and inspiring 3D effect. Its compact form factor makes it ideal for social events and casual use. To bring this vision to life, I combined my expertise in software engineering, high-speed PCB development, and design.

Trailer Video:



Instagram:



Custom Circuit Board

The system is centered around a custom circuit board that integrates the various components and facilitates seamless communication between them. Beyond connectivity, the board manages power distribution: it converts voltages, ensures safe battery charging, and monitors power levels to provide users with accurate remaining charge estimates. Crucially, the board coordinates four independent microprocessors. This synchronization allows the camera to capture four separate images within 16ms of each other, ensuring a consistent 3D effect even when capturing moving subjects. The circuit board also incorporates all I/O, featuring a mounted SD card slot for easy image export and a USB-C port for charging.

Software

The camera runs on a fully custom and self-developed software stack that handles everything from capturing the images to transforming them into final wigglegrams. At its core, the system uses low-level C code to manage the cameras, handling the precise timing and configuration. To ensure precise alignment of the four frames, a custom alignment system automatically analyzes the images and creates the final wigglegram. The software also provides a modern user interface that enables intuitive capture and creation. To share wigglegrams, a custom wireless transfer system was implemented that easily transfers the images to your phone.