Meet the Maker: Software Developer Builds Fully Functional Superhero Helmet

Atlanta-based Kris Kersey builds heads-up display for superhero gear powered by the NVIDIA Jetson platform for edge AI and robotics.

Author: Angie Lee

Kris Kersey is an embedded software developer with over 20 years of experience, an educational YouTuber with 30,000+ subscribers, and a lifelong lover of comics and cosplay.

These interests and expertise came together in his first-ever project using the NVIDIA Jetson platform for edge AI and robotics when he created a fully functional superhero helmet as portrayed in one of his favorite Marvel Comic films, Iron Man .

The 3D-printed helmet comes complete with computer-vision capabilities in a heads-up display (HUD) that presents information wherever the user's looking, just like in the movie.

The NVIDIA Jetson platform processes data from two cameras — one by each eye slot — that see what the helmet's wearer is seeing. The HUD then presents information including the current temperature, humidity, altitude and GPS location. It can also classify what's in the user's view based on deep neural networks for object detection.

To let others join in on the fun, Kersey shared his entire workflow on his popular YouTube channel, Kersey Fabrications.

Superhero films and science fiction remind Kersey that cutting-edge technology requires collaboration across disciplines, he said.

"Often, as with this project, artists and storytellers use their imaginations to come up with brilliant ideas — then, it's up to scientists and engineers to make them real," the developer said.

Kersey, who studied computer science at Southern Polytechnic State University — now part of Kennesaw State University — in Georgia, has broad experience working with embedded microprocessors and architectures. He specializes in the Linux operating system, which is compatible with the NVIDIA Jetson platform.

"Writing software on the Jetson platform didn't require that I learn a new programming language or operating system, which made it very easy for me," the maker said.

By day, he's a software engineer at an Atlanta-based startup. By night, he's working on projects in his personal makerspace.

"I've never used my garage for cars," he said.

Instead, it's full of tools, boards and other equipment that enable his marvelous projects.

Kersey emphasized that what's important to him most of all, however, is his family, with whom he likes to play board games, watch movies and go on hikes.

Kersey's fascination with technology stemmed from his childhood. His mother was a teacher focused on computer-aided drafting and mechanical design.

"From a very early age, I could tinker with computers that she had access to, which always fascinated me," he said. "My cousin also once gave me an old 8-bit computer, but there wasn't much I could do with it, so I remember pulling out the manual and reading the whole thing — that taught me basic

programming.”

More recently, Kersey got into 3D printing while helping his son with a project for Science Olympiad.

“From that moment on, I got really into 3D printing as a hobby — my son never really took to it a whole lot,” he mused.

In 2018, Kersey created his YouTube channel with a focus on 3D printing as a way to delve deeper into the maker community while teaching others what he’s learned along the way.

Kersey’s 3D-printed, fully functional, wireless Iron Man helmet — which he even sanded and painted himself — could be straight out of the iconic films.

The prototype used the NVIDIA Jetson Xavier NX developer kit as the core powering its HUD.

“For this whole experience to feel as awesome as Iron Man’s tech, it has to be real time, low latency, high resolution and high frame rate,” Kersey said. “It also needs to display a lot of information on screen, which requires a powerful graphics processor — that’s why I chose the Jetson platform.”

Jetson developer kits are equipped with a powerful, onboard NVIDIA GPU and AI capabilities to supercharge embedded applications.

Kersey also tapped the NVIDIA TensorRT software development kit to enable high-performance deep-learning inference with low latency and high throughput for the project.

For the next generation of the helmet’s HUD — a project that’s “not finished till it’s finished,” according to the maker — Kersey used the NVIDIA Jetson Orin Nano developer kit. Launched in September, the kit has set a new standard for creating entry-level AI-powered robots, intelligent cameras and more.

It only took Kersey two hours to get from opening the Orin Nano box to having the software deployed and running, he said.

He’s now looking to upgrade the project with the Jetson Orin NX 16GB system-on-module, as well as build a full suit beyond the headgear, starting with prototype aluminum repulsors.

And the developer will soon make the project’s code open source, so others can easily turn themselves into superheroes, too.

Kersey plans to wear the upgraded superhero gear at Dragon Con — the world’s largest multimedia, popular culture convention — taking place in August. Plus, at this month’s MomoCon in Atlanta, he’ll present on a panel titled Making It Real: High Tech in Cosplay .

Asked if Iron Man is his favorite superhero, Kersey said with a smile: “He is right now.”

Check out Kersey Fabrications on YouTube and learn more about the NVIDIA Jetson platform .

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