

# Foundry for the future: The Silicon Valley of Appalachia

Salena Zito | June 22, 2026

**PITTSBURGH, Pa.** — The familiar hum of a coal barge pushing the region's black gold up the Monongahela River holds the same low rumble it did a century ago, softly echoing through the valley towns where steel once defined the American identity.

But follow the Monongahela River just upstream from Pittsburgh, toward the historic Hazelwood Green site, and the landscape begins to change. This was once the home of the Jones and Laughlin Steel Company, a sprawling 178-acre industrial complex that began producing iron and steel in 1887. For generations, its rail lines, blast furnaces and mills helped power America's industrial rise.

Today, several of the site's massive rust-colored steel skeletons still stand, most notably Mill 19. For decades, they loomed over the riverfront like sentinels from another age, waiting to be useful again. Now they are. As part of Carnegie Mellon University's new Robotics Innovation Center, the old mills are being reborn, and the sharp scent of hot steel is giving way to the rhythmic whir of robotic joints.

Here, Pittsburgh workers forged much of the steel that helped meet America's World War II demands and later built the roads, bridges, factories and suburbs of the postwar boom. But after the steel collapse of the 1980s hollowed out city

neighborhoods such as Hazelwood and river towns throughout the valley, this once-mighty industrial space sat waiting for a new purpose. Now it has one.

It is the birthplace of a new American renaissance. Pittsburgh is quietly cementing its status as the Silicon Valley of Appalachia, anchoring a new industrial revolution by marrying blue-collar trades with high-tech intelligence and high-stakes military strategy.

## The industrial convergence

After a comprehensive tour with faculty members, many of them veterans or former military officials, Carnegie Mellon President Farnam Jahanian said the remarkable thing is that the university now sits at the center of a convergence between Pittsburgh's old industrial economy and its emerging innovation economy.

"The economy of this region, which was based on manufacturing, based on energy and heavy industry extraction, was under a tremendous amount of pressure," Jahanian said. "Fast forward to today, and we find ourselves in an innovation economy that's being built around tech and a resurgence and renaissance of the manufacturing and industrial economy."

The catalyst for that convergence began in 2017 with a Department of Defense-backed proposal that established the Advanced Robotics

for Manufacturing Institute. Today, that partnership with the military has expanded rapidly.

Just last week, military leaders, researchers and technology pioneers gathered at the Robotics Innovation Center for an event hosted by Army Combat Capabilities Development Command's Artificial Intelligence Integration Center, with support from the Army's Fuze program, an initiative at the forefront of defense innovation. Welcoming a room filled with generals, innovators and defense partners, Jahanian pointed them toward the world just outside the building.

"If you look out of literally any window, in any direction right now, you can see transformation in real time," Jahanian said. "With over 100 firms choosing to locate in our region to shape the future of robotics and AI, Pittsburgh is once again a foundry for the future — helping to advance our country's innovation, economic growth and national security."

## The heavy metal and high intelligence of physical AI

Step onto the laboratory floors of Hazelwood Green, and the abstract idea of artificial intelligence becomes something physical: steel, sensors, cameras, robotic arms and heavy machinery. Here, multi-axis industrial robots equipped with spatial AI sensors do more than repeat a rigid script. They adapt.

---

In one corner, heavy-duty robots work like autonomous blacksmiths. Powered by AI-driven incremental forging systems, they manipulate glowing alloys while machine-vision cameras help them adjust their grip and motion in real time.

Nearby, massive castings for military vehicles are scanned by synchronized mobile robotic platforms using multimodal AI to detect structural flaws that would be difficult for the human eye to catch.

Other next-generation robots use tactile grippers and predictive algorithms to handle flexible textiles, pointing toward the automated production of critical defense gear.

"Our focus is on digitalizing the manufacturing of the future and bringing data into manufacturing decisions ... where we have the data-informed decisions that then go back out into the physical world," explains Rod Heiple of the manufacturing institute at Carnegie Mellon. "You'll see examples of physical AI here ... to inform equipment, to inform machines and importantly, inform human workers."

### **The geopolitical stakes of the shop floor**

While Silicon Valley specializes in code, apps and virtual abstractions, Pittsburgh specializes in the physical world. And today, that focus carries immense geopolitical weight. The Department of War is heavily investing here because America's reliance on foreign supply chains has become a glaring national security vulnerability.

Critical aerospace-quality forgings currently suffer from lead times

as long as 36 months because the domestic workforce has dwindled. Global conflicts have exposed the fragile bottlenecks of modern warfare, making domestic manufacturing a priority.

This urgency is exactly why the military has embedded itself at Carnegie Mellon. The university is home to the Army Artificial Intelligence Innovation Center.

"Here at Carnegie Mellon, AI2C is home to the largest gathering of AI-trained soldiers in the nation," Jahanian told the military leaders at the Fuze event. "That is not simply a point of pride for our university. It is a strategic asset for our country. AI2C represents a powerful model for the future — bringing together soldiers, researchers, industry partners and innovators to develop the talent, tools and capabilities needed for an AI-ready Army."

Jahanian said the central challenge now is not merely inventing new technology, but moving it fast enough to meet modern defense needs. Carnegie Mellon, he said, is rethinking how it turns research into real-world capability so breakthroughs do not sit on a shelf, but move quickly from the lab to production and scale.

### **A human-centric blue-collar renaissance**

The genius of Appalachia's tech boom lies in its refusal to leave its people behind. In the original Silicon Valley, software engineers are kings and traditional trades are an afterthought. In Pittsburgh, the machine shop remains holy ground.

"Our digitalization of manufacturing is really human-worker centric,"

Heiple stresses. "We're driving to improve the performance and the work life of human workers in the manufacturing plant."

This isn't a story of displacement, it's a story of continuation. Jahanian noted that breakthrough innovation happens when those closest to the mission work side by side with those advancing the frontiers of science. In Pittsburgh, those closest to the mission are the soldiers who will use the technology and the tradespeople who will build it.

The infrastructure of energy and heavy transport — the rivers, the rails, the deep-seated cultural understanding of how things are forged — is the exact foundation upon which this new industrial revolution is built.

A new generation of tech-savvy tradespeople is stepping up to the plate, operating complex robotic arms and training AI tools with the same steady hands and hardened resolve that their fathers, and their fathers before them, used to pour liquid steel.

The pressure that once threatened to hollow out these river valleys permanently has instead forged a new breed of American ingenuity. Through the expanding partnership between higher education, blue-collar grit and the U.S. military, Pittsburgh has proven that the American heartland doesn't need to adapt to the future — it is building it.