

April 16, 2025
Pittsburgh, PA

Pennsylvania Senate Majority Policy Committee Hearing:
The Future of AI Innovation in Pennsylvania

The Pittsburgh Supercomputing Center (PSC), a joint research center between Carnegie Mellon University and the University of Pittsburgh, has enabled scientific discovery for tens of thousands of researchers at the national, state, and local levels. For over 39 years, **PSC has acquired and operated 20 supercomputers, including key systems that unlocked AI research and applications**, consistently supporting and upgrading infrastructure to meet the evolving needs of researchers, educators, and industry partners. The presence of PSC in Pennsylvania has historically brought in millions of dollars annually in federal funding to researchers in the broader Southwestern Pennsylvania area and across the state who use our resources. PSC's portfolio includes over thirty active funding streams from federal agencies such as the NSF, NIH, and DOE.

In the last two decades, advanced computing has catalyzed economic development and job creation. Across multiple sectors, it plays a crucial role in solving the most challenging problems and boosting discovery and innovation that lead to significant economic benefits. **Recently, AI has become a force multiplier that accelerates research and development cycles, leading to greater economic and workforce development opportunities.** PSC is a critical asset for leading academic institutions in Pennsylvania, historically enabling groundbreaking discoveries and technology. Using PSC's flagship supercomputer, Bridges-2, researchers at the University of Pittsburgh are using AI to prevent buckling or breaks in railways¹, directly improving safety and reducing operational costs in an industry that contributes billions of dollars to the Commonwealth, transporting over 50 million passengers and moving hundreds of millions of tons of freight annually².

“You can think of a rail as an element fixed at two ends. When the temperature goes high, it tends to expand, and because it cannot expand, it generates compressive forces—and the opposite, of course, in winter, when there are traction forces. During these temperature extremes, there is either a buckling phenomenon or rail fracture. The idea of the project is to predict the temperature at which these dramatic phenomena would occur. And we are tackling this prediction with a machine learning perspective, and machine learning needs a lot of data.”

— Piervincenzo Rizzo, University of Pittsburgh

¹ Simulations on Bridges-2 Teach AI Program to Prevent Buckling or Breaks in Railways: <https://www.psc.edu/railway-stress/>

² Pennsylvania State Rail Plan 2020: <https://advancingparail.com/pennsylvania-state-rail-plan/>

In addition to supporting thousands of users from the scientific community every year, PSC also offers access to in-depth expertise and computing resources for businesses, startups, and companies. Avista Therapeutics³, a startup biotech company based in Pittsburgh, is using PSC's resources to develop gene therapies to treat blindness.

“Most of our datasets are large sequencing results from millions of cells of the eye to see which cell the virus has infected. This requires a lot of storage capacity and CPU power to identify those cells and analyze the patterns of infection to choose the virus that has the features we need to treat a particular disease. PSC has been fundamental to us being able to do this work.”

— Molly Johnson, Avista Therapeutics

Investments in cyberinfrastructure designed to handle these large-scale scientific computing and AI workloads will give Pennsylvania a significant competitive advantage by enabling leading-edge innovation, supporting advanced research, and enhancing collaboration, all critical factors for staying ahead in a competitive landscape. For this reason, skills in AI, data science, advanced computing infrastructure, and related tools are pivotal for Pennsylvania industries and academic institutions. In the last two years, PSC's ADAPT PA program has supported over 350 students and teachers in 19 institutions, including community colleges, PASSHE, and private schools. The program focuses on enhancing curricula and empowering students with practical skills for the workforce, and creating tools that can be used by learners across the state, effectively preparing participants for careers in business, artificial intelligence, data science, computer engineering, and software development.

To bolster the Commonwealth's Economic Development Plan, **investments must continue to support AI workforce development initiatives and new training opportunities that allow for the expansion, retention, and attraction of a skilled workforce** that will serve as a cornerstone for the advancement of technology, life sciences, robotics, energy, healthcare, and precision agriculture within the state. By investing in these initiatives, the state will shape the future of PA as a leader in AI and promote further economic growth by helping researchers pursue funding, accelerating job creation, and fostering unique research and development opportunities for Pennsylvania businesses. **PSC is well positioned to support and enhance these state-wide efforts** with reliable access to robust, scalable, and secure cyberinfrastructure for responsible fundamental and applied AI research, including critical resources such as high-performance computing, data storage, networking, and cloud computing, **ensuring that Pennsylvania's businesses and institutions remain nationally competitive in AI innovation.**

³ Avista Therapeutics: <https://www.avistatx.com/>