Testimony of Ayanna Howard, Dean of Engineering, The Ohio State University

U.S. Congress Joint Economic Committee

"Artificial Intelligence and Its Potential to Fuel Economic Growth and Improve Governance"

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Chairman Heinrich, Vice Chairman Schweikert, and members of the Joint Economic Committee:

Thank you for the opportunity to participate in today's hearing on artificial intelligence and its potential for job growth and improved governance. It's an honor to be with you today.

My name is Ayanna Howard, and I am an innovator, entrepreneur, leader, and international expert in robotics and AI. Currently, I am the Dean of Engineering at The Ohio State University and Monte Ahuja Endowed Dean's Chair. Previously, I served as the Chair of the School of Interactive Computing at the Georgia Institute of Technology. I have also served as the Associate Director of Research for the Institute for Robotics and Intelligent Machines, Chair of the Robotics Ph.D. program, and the Associate Chair for Faculty Development in the School of Electrical and Computer Engineering at Georgia Tech.

From 1993-2005, I was at NASA's Jet Propulsion Laboratory where I held the titles of Senior Robotics Researcher and Deputy Manager in the Office of the Chief Scientist. I hold a degree in engineering from Brown University, a M.S. and Ph.D. in Electrical Engineering from the University of Southern California, and an M.B.A. from the Drucker Graduate School of Management.

After leaving NASA in 2005, I entered academia and started up my own robotics research lab. My research encompasses advancements in artificial intelligence (AI), assistive technologies, and robotics, and has resulted in over 275 peer-reviewed publications. In 2013, I founded Zyrobotics, a university spin-off, which designed AI-powered STEM tools and learning games for children with diverse learning needs.

I regularly consult and sit on the advisory boards of several organizations concerned with robotics, AI, and workforce development. This includes my appointment as a member of the National AI advisory committee which is tasked with advising the President and the National AI Initiative Office on topics related to AI. My work has also been highlighted through a number of awards and articles, including highlights in *Vanity Fair, USA Today*, *Upscale, Black Enterprise*, and *TIME Magazine*, as well as being recognized as one of the 23 most powerful women engineers in the world by *Business Insider* and one of the Top 50 U.S. Women in Tech by *Forbes.*

Needless to say, I am not only a practitioner and developer of AI technologies but I've also been a committed advocate for developing the diverse talent pool that is needed for addressing the future workforce needs involving these advanced technologies.

My comments in this testimony are therefore focused on the national importance of AI literacy and its role in augmenting the current and future workforce talent pool as well as the government's role in enabling this to happen.

While demographics of the United States are changing, these changes are not reflected in the diversity of students pursuing degrees related to AI, engineering, or computer science. According to the 2023 World Economic Forum Future of Jobs Report, AI continues to shift the skills that are needed within the workforce – in some cases creating new jobs, augmenting old jobs, and eliminating other jobs. When I attended the World Economic Forum this past January as an invited speaker in Davos, it was clear that the AI talent shortage is not just a U.S. problem. Buying outside talent is thus no longer a viable option to solve this issue. Too often though, we disregard our untapped talent pools. Organizations tend to over index on hiring new talent with needed skills versus upskilling their current talent.

As an educator, I have witnessed bright students whom, because of gaps in their high school curricula, leave the engineering major because they struggle when they take their first discipline-specific engineering courses. Yet, when we have instituted enrichments programs, such as the PREFACE and ACCELERATE program in the College of Engineering at The Ohio State University, we have seen quantifiable growth in student retention and graduation rates in engineering. There is thus no reason, beyond intentionality (and resources), why organizations, government agencies, and educational institutions cannot institute similar AI training and literacy programs within their own organizational borders. We must provide more mechanisms than currently exist in order to be able to support the diversity of American participation and welcome all into the AI ecosystem.

There has been some movement in Congress to expand the Digital Equity Act into an AI Literacy Act but there needs to be more. We can no longer sit by and not have an unprecedented investment in expanding AI training and literacy, starting from early education through upskilling of the current workforce. Such an investment addresses a looming workforce need, a national security issue, and a major risk to national welfare. If AI is to live up to its potential of providing equitable solutions to enhancing our lives positively, the government should recommit to its fundamental mission of focusing on the public good and providing for the needs of society. We must act now to institute an AI educational transformation that provides every interested mind an equitable seat at the table.

As a technology researcher and college dean, I also dabble a bit in policy with respect to AI and regulations. I've been thinking about technology and trust for much of my career. I wrote an opinion piece about the possibility of regulations around AI back in 2019. I think policy will be critical to building trust. Policies and regulations allow for equal footing by establishing expectations and ramifications if companies or other governments violate them. Now, some companies will disregard the policies and just pay the fines — but there still is some concept of a consequence.

Right now, there's a lot of activity around AI regulations. There's the European Union AI Act, which the Parliament adopted in March 2024. There are draft AI guidelines that were released by

the Japanese government, and slightly different proposals in the United States, including President Biden's AI executive order.

There's state-specific activity, too. Over the past five years, it's been documented that 17 states have enacted 29 bills that focus on some aspect of AI regulations. This year, California introduced Senate Bill 1047, a comprehensive AI Bill with the goal of establishing safe and secure AI innovation. On June 11, I'll be participating in an AI symposium at the Ohio Statehouse, which will bring together academic leaders, policymakers, and industry experts to discuss opportunities and challenges of artificial intelligence for Ohio's universities. This practice of each state coming up with their own rules for regulating AI will continue if policies and AI bills are not being passed at a federal level. And that's a problem. AI doesn't understand the concept of borders and state lines – it's becoming as ubiquitous as the internet. Policies and regulations, when it's done correctly with diverse perspectives and iterative feedback from all impacted stakeholders, can be accomplished smartly without impeding innovation or entrepreneurship.

I believe we have a lot of room for improvement in making sure that people not only understand technology and the opportunities it provides but also the risks it creates. With new federal regulations, more accurate systems, and increased AI literacy training and upskilling for the untapped labor market, this can happen.

The intersection of the country's growing dependence on advanced AI technologies coupled with a clear shortage of AI talent is fast becoming a national security issue that must be addressed urgently.

In an April 30, 2021, speech, Secretary of Defense Lloyd J. Austin III emphasized that sophisticated information technologies, including artificial intelligence, will be key differentiators in future conflicts. The United States though risks not having enough talent trained with sufficient AI literacy that is needed to advance emerging technologies critical to maintaining American leadership.

If we are not careful, we might be living another 1957's Sputnik moment, when the United States suddenly realized the need to invest in science education to avoid losing the space race with the then-Soviet Union. When the Soviet Union launched Sputnik in 1957, the United States launched a bold initiative - the National Defense Education Act of 1958, which legitimatized federal funding for higher education and led to the transformational talent growth of new engineers and scientists. This powered the economy growth of the U.S. and American innovation through the subsequent decades. Today, with nearly every aspect of life evolving to being coupled to artificial intelligence, the United States cannot afford to sit back and wait for an AI-based crisis to hit. We are at a crossroads. The U.S. must make an equivalently bold investment in growing the AI talent pool to help protect democracy, citizens' quality of life, and the overall health of the nation.

Thank you for the opportunity to participate in this important hearing. I appreciate the Committee's attention to this topic. I stand ready to answer your questions and work with you on

moving forward to help create an ecosystem that allows for the democratization of AI technology that ensures no one is left behind as we drive forward American innovation and competitiveness.

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