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The U.S. AI Workforce—Labor Market Dynamics

CSET defined the AI workforce by linking the skills and competencies necessary to design, develop, and deploy AI systems to 54 occupations as [defined](#) by the Department of Labor. We include both technical and non-technical occupations within our definition, because both are needed to develop safe and effective AI systems.

Using this definition, CSET [analyzed](#) the AI labor market using employment microdata from the U.S. Census Bureau's American Community Survey, occupational employment projections from the U.S. Bureau of Labor Statistics, and job posting data from Burning Glass and LinkedIn Insights. This analysis found that:

- The AI workforce accounted for about 9 percent of total U.S. employed in 2019, and grew rapidly from 2015 to 2019, with technical occupations growing the fastest.
- From 2019 to 2029, demand for AI occupations is projected to grow twice as fast as for all U.S. occupations.
- AI employment is geographically concentrated across many metropolitan areas, including some outside of the core known and discussed "tech hubs." The top two regions in terms of total employment in AI occupations are the San Francisco bay area and the Washington, D.C metropolitan area.
  - Controlling for population differences, the *share* of individuals in AI occupations is highest in Seattle, the Washington D.C. metro area, and the San Francisco bay area. Other hotspots included Ann Arbor, Atlanta, Austin, Denver, and Minneapolis. Several less densely populated areas that house National Labs, like northern New Mexico, or military facilities also have high shares of AI occupations.
  - *Technical* occupations are also concentrated in metropolitan areas, primarily Los Angeles, San Francisco, and Seattle. Atlanta, Austin, Denver and Salt Lake City also have notable concentrations of technical AI talent.

The U.S. AI Workforce—Policy Recommendations

Based on our research, we offer policy recommendations to accelerate the development of the U.S. AI workforce toward three goals: (1) increase the supply of domestic AI doctorates, (2) sustain and diversify technical talent pipelines, and (3) facilitate general AI literacy.

To achieve these goals, we propose a set of recommendations:[1]

- The National Artificial Intelligence Initiative Office for Education and Training should be fully leveraged to coordinate federal and state U.S. AI education and training policies, and Congress should authorize funding to appropriately staff the office and support initiatives.
- Congress should fund NIST, or another federal entity if appropriate, to conduct multi-stakeholder collaboration to develop a framework of technical and nontechnical AI work roles and competencies, updated regularly, similar to the NICE framework used in cybersecurity.
- Congress should establish federal grant programming for industry-institution partnerships in AI and AI-related degree and nondegree programs at community colleges and minority-serving institutions, including high school dual enrollment programs.
- Congress should establish federal grant programming to equip facilities with AI labs and virtual learning platforms for hands-on learning and remote learning. Grant money should be made available to minority serving institutions.

China's AI Workforce—Indicators of Demand

The AI workforce is global and in high demand, and a large share of U.S. top-tier technical talent is foreign-born. Given that China is a major producer of AI-skilled talent, data on its AI workforce could provide important insight. A recent CSET paper analyzes the state of AI workforce demand in China using a curated dataset of 6.8 million job postings from 4 major Chinese job boards developed in collaboration with AMPLYFI, a U.K.-based machine learning firm.

Over 30% of the 6.8 million jobs were classified as AI-related, using a modified version of the same occupation-based definition as above. Of these, 14% of the 6.8 million jobs were classified as technical AI-related occupations that could involve the design, development, and deployment of AI.

- 60% of these technical AI-related jobs were in Shanghai and the provinces of Guangdong and Jiangsu.
- 53% of these technical AI-related jobs required a bachelor's degree, but there are also a significant number of job postings in technical roles that do not require a bachelor's degree or higher.

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[1] See here for a full list of recommendations. These recommendations are part of a series of CSET publications on AI workforce and education policy. See here, here, and here for additional research.

- A subset of these technical AI-related jobs (~10%) are certainly in the AI workforce, using AI terms such as "machine learning" and "robotics" in their postings. These jobs offer higher salaries but require more experience and higher education levels.