

Will Your Job Be Replaced By A Robot?

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Automation and technologies such as artificial intelligence (AI) will be major, perennial disruptors of occupations, industries, and regional economies. Although automation will destroy many jobs, history strongly suggests that automation will engender productivity gains and new types of work, thereby creating many more jobs than it destroys. For example, throughout the 20th century, technological advances destroyed millions of the nation's agricultural jobs while creating millions more in other (often new) industries. Productivity gains from automation, AI, and other technologies will bring higher standards of living to those with in-demand skills, but the benefits of these gains do not necessarily go to the workers whose jobs are displaced. A college education therefore will help protect workers against the workforce disruptions created by automation.

As the workforce ages and immigration controls tighten, a persistent deficit of labor in the U.S. is possible. One implication is that even workers without in-demand skills will find jobs, but it is likely that the gap between their work-life earnings and that of more educated workers will widen appreciably and further hollow out the middle class. In contrast, increasing the percentage of adults who have either a college degree or a high value certificate will slow and perhaps even reverse this trend.

All occupations and industries have tasks that are automatable, but routine physical and cognitive tasks such as office administration, production, transportation, and

food preparation are the most vulnerable. According to research from the Brookings Institute¹, Georgia ranks 34 among the states in the share of tasks in its existing jobs that can be automated, which suggests that Georgia is relatively less vulnerable to automation. To understand this better, the Selig Center compared automation potential by industry² to Georgia's employment location quotients obtained from the U.S. Bureau of Labor Statistics for the first quarter of 2017. Location quotients—the ratio of an industry's share of employment in a particular state to that industry's share of employment in the nation—are useful for identifying industries with high, or low, concentrations of jobs relative to the nation as a whole.

Our analysis shows that Georgia's overall industrial structure makes the state less vulnerable to automation because of the six major groups of industries with high automation potential, only one—transportation and warehousing—has a high concentration of jobs in Georgia compared to the U.S. In addition, two industry sectors with very low potentials for automation (administrative and support services, and information) are highly concentrated in Georgia. Nevertheless, the Brookings' rankings of all U.S. metropolitan areas show that several of Georgia's MSAs have very high automation potentials and thus are quite vulnerable to disruption. It is striking that Dalton's automation potential is the highest in the nation and so it should move quickly to embrace lifelong learning (postsecondary education) in anticipation of high job losses. Gainesville ranks 25 among 381 U.S. metro

areas in terms of its automation potential; Rome ranks 79, and Valdosta ranks 127. In contrast, the automation potential in the Atlanta MSA is relatively low. The Brookings study did not estimate automation potentials for Georgia’s smaller towns and rural areas, but rural economies are typically very dependent on industries with the highest automation potentials—agriculture, manufacturing, tourism (lodging and food services), retail, mining, and transportation and warehousing. Thus, a better educated workforce will mitigate job disruptions created by automation.

References

1. Muro, Mark; Maxim, Robert; and Whiton, Jacob (2019). *Automation and Artificial Intelligence: How Machines are Affecting People and Places*. Washington DC: Brookings Institute, Metropolitan Policy Program.
2. McKinsey Global Institute (2017). *A Future That Works: Automation, Employment and Productivity*.

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Table 1
Task Automation Potential
and Employment Concentration, by Industry

<u>Industry Sector</u>	<u>Task Automation Potential</u>	<u>Sector Concentration in Georgia*</u>
Accommodation and food services	73	1.03
Manufacturing	60	1.06
Transportation and warehousing	60	1.32
Agriculture, forestry, fishing, hunting	57	0.7
Retail trade	53	1.03
Mining	51	0.25
Other services (except gov’t)	49	0.79
Construction	47	0.9
Utilities	44	1.14
Wholesale trade	44	1.22
Finance and insurance	43	0.93
Arts, entertainment and recreation	41	0.75
Real estate and rental and leasing	40	1.04
Administrative and support	39	1.21
Information	36	1.31
Health care and social assistance	36	0.82
Professional, scientific and technical services	35	0.98
Management of companies and enterprises	35	1.03
Educational services	27	0.85

*Based on Location Quotient measure, which compares the share of industry employment in Georgia to the industry’s employment share in the United States on average. Totals include paid employment, subject to Unemployment Insurance.

Source: Selig Center for Economic Growth, based on McKinsey Global Institute, *A Future That Works: Automation, Employment and Productivity*; U.S. Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*, Quarter 4, 2018.

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ADVANCING GEORGIA'S ECONOMIC FUTURE
THROUGH POSTSECONDARY EDUCATION

The Power of Potential

A Report to the Bill & Melinda Gates Foundation
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University of Georgia*

The full report is available on our website (www.selig.uga.edu)