Preparing the Workforce for Automation: Examples in the Real World

Jeff Burnstein
President
Association for Advancing Automation (A3)
Setting the Stage

The increased adoption of robotics & automation in the United States is:

1. Improving productivity & competitiveness
2. Generating profits that bring in additional investment & jobs
3. Supporting entire supply chains & communities
Setting the Stage

Robotics & automation are:

1. Keeping US companies globally competitive
2. Freeing up workers to do safer, more fulfilling jobs
3. Creating a new wave of jobs in desirable fields
More Robots, More Jobs

Industrial Robot Shipments vs. Unemployment Level in the U.S.

Source: Association for Advancing Automation (A3) and U.S. Bureau of Labor Statistics (BLS)
More Robots, More Jobs

In the United States...

- **2010**
  - New Robot Shipments: $+177,347$
  - Manufacturing Jobs: $+1,214,000$
  - Unemployment Rate: Declined $6.1\%$

Source: US Bureau of Labor statistics and RIA data
China is Pulling Ahead

137,920 new robots installed in 2017 (Global Rank = 1)

34,671 of those units from Chinese Suppliers

Growth of 59% over 2016

CAGR of 43% from 2012-2017
The U.S. is Falling Behind

- US is 6th in the world in robot density
- 200 robots per 10,000 manufacturing workers

Source: "Which Nations Really Lead in Industrial Robot Adoption," ITIF, Robert D. Atkinson, November 2018
The U.S. is Falling Behind

- When you control for wages, U.S. is 16th in the world in robot adoption
- Asia is way ahead, and western developed nations are behind

Source: "Which Nations Really Lead in Industrial Robot Adoption," ITIF, Robert D. Atkinson, November 2018
Line cook shortage is changing metro Detroit's restaurant industry

Source: "Line cook shortage is changing metro Detroit's restaurant industry," Mark Kurlyandchik, Detroit Free Press, November 15, 2018
Not Enough People to Fill Jobs

- Unemployment at a nearly 50 year low
- Skills gap is forming with unfilled jobs

Sources: “Employers struggle to find staff as unemployment rates reach all-time low,” Piper Shaw, WMTV NBC15 Wisconsin, July 11, 2018
“Jobs Go Unfilled as the Economy Expands,” Eric Morath and Jennifer Smith, The Wall Street Journal, August 7, 2018
The Skills Gap & Its Impact

In 2028...

2.4 million jobs will be left unfilled due to the skills gap

$454 billion in economic output at risk of being lost

Source: Deloitte and Manufacturing Institute
### IloT and AI are Shaping the Jobs of the Future

- Occupations with **10%** more new job titles grow **5%** faster
- A3 members have a long list of new job titles they need to fill…

<table>
<thead>
<tr>
<th>Machine Learning Engineers</th>
<th>Machine Algorithm Designers</th>
<th>Robotic Application Developers</th>
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<tr>
<td>Mechatronics Technicians</td>
<td>Computer Vision Designers</td>
<td>Industrial Network Integration Engineers</td>
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<td>Predictive Equipment Analytics Specialists</td>
<td>Robot Designers</td>
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<td>Cyber-Security Experts</td>
<td>Vision Systems Engineers</td>
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<td>Robotics Engineers</td>
<td>AI Trainer</td>
<td>IloT &amp; Data Analysts</td>
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Source: The Race Between Machine and Man, MIT
Recent GAO Report Findings

1. Industries with a greater proportion of jobs susceptible to automation were more likely to have experienced growth in tech jobs (i.e., computing, engineering, and mathematics) from 2010 to 2016—possibly an indicator of industries preparing to adopt advanced technologies.

2. Occupations susceptible to automation and industries with a greater share of these jobs did not experience meaningfully higher job loss rates in this period (2010-2016), though it could be too soon to observe these effects.
3. Certain groups, such as workers with no college education and Hispanic workers, tended to hold jobs susceptible to automation in 2016, and thus could be disproportionately affected by changes if they occur.
Our Session Today

I. Workforce Training Programs that Work: Retraining the Under-employed, Secondary and Post-Secondary Workforce in a Highly Blue Collar Industry Region that is Rapidly Automating
   • Ritch Ramey, Engineering Technologies Coordinator at Tri-Rivers Career Center RAMTEC, Marion, OH
   • Bob Graff, Senior Sales Manager, STEM Education, YASKAWA AMERICA, INC., Motoman Robotics Division

II. Leveraging AI to Close the Skills Gap: Cognitive Tutors in Community College and Vocational Training Settings
   • Dr. Lee Branstetter, Carnegie Mellon University, Heinz College Block Center for Technology and Society, Pittsburgh, PA

III. Organized Labor Strategies: Engaging in the Innovation Process to Shape the Future of Work
   • Edward Wytkind, Former President, Transportation Traded Department, AFL-CIO; currently advisor to labor on future of work and technology

IV. Human Machine Teaming from the Perspective of the Human-Strategies for Engaging Students and Communities with Emerging Technology
   • Prof. Michael A. Gennert, Robotics Engineering Program, Computer Science and Electrical & Computer Engineering Department, Worcester Polytechnic Institute, Worcester, MA
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