



**RoboticsCareer.org**

POWERED BY ARM INSTITUTE

# Equipping US Manufacturers with a Skilled Technical Workforce: A Competency Based Approach

High Impact Technology Exchange Conference  
July 26th, 2023

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**ARM Institute**



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**Director of Product**  
**Management**  
**ARM Institute**







# ABOUT THE ADVANCED ROBOTICS FOR MANUFACTURING (ARM) INSTITUTE

- Established 2017 by Carnegie Mellon University
- One of 17 national Manufacturing USA Institutes
  - 1 of 9 funded by the US Department of Defense
- A Public-Private Partnership: >390 members across industry, academia and government representing the entire robotics ecosystem
- >150 projects funded to date in both technology and workforce development
- Managed >\$100 Million to date of US Government Investments to date, matched > 1:1 by cost share investments from members

# The ARM Institute Mission

The ARM Institute accelerates the development and adoption of innovative robotics technologies that are the foundation of every advanced manufacturing activity today and in the future.

We leverage a unique, robust and diverse ecosystem of partners across industry, academia and government to:

**Make robotics,  
autonomy and  
artificial intelligence  
more accessible to  
U.S. manufacturers  
large and small**

**Train and  
empower the  
manufacturing  
workforce**

**Strengthen our  
economy and global  
competitiveness**

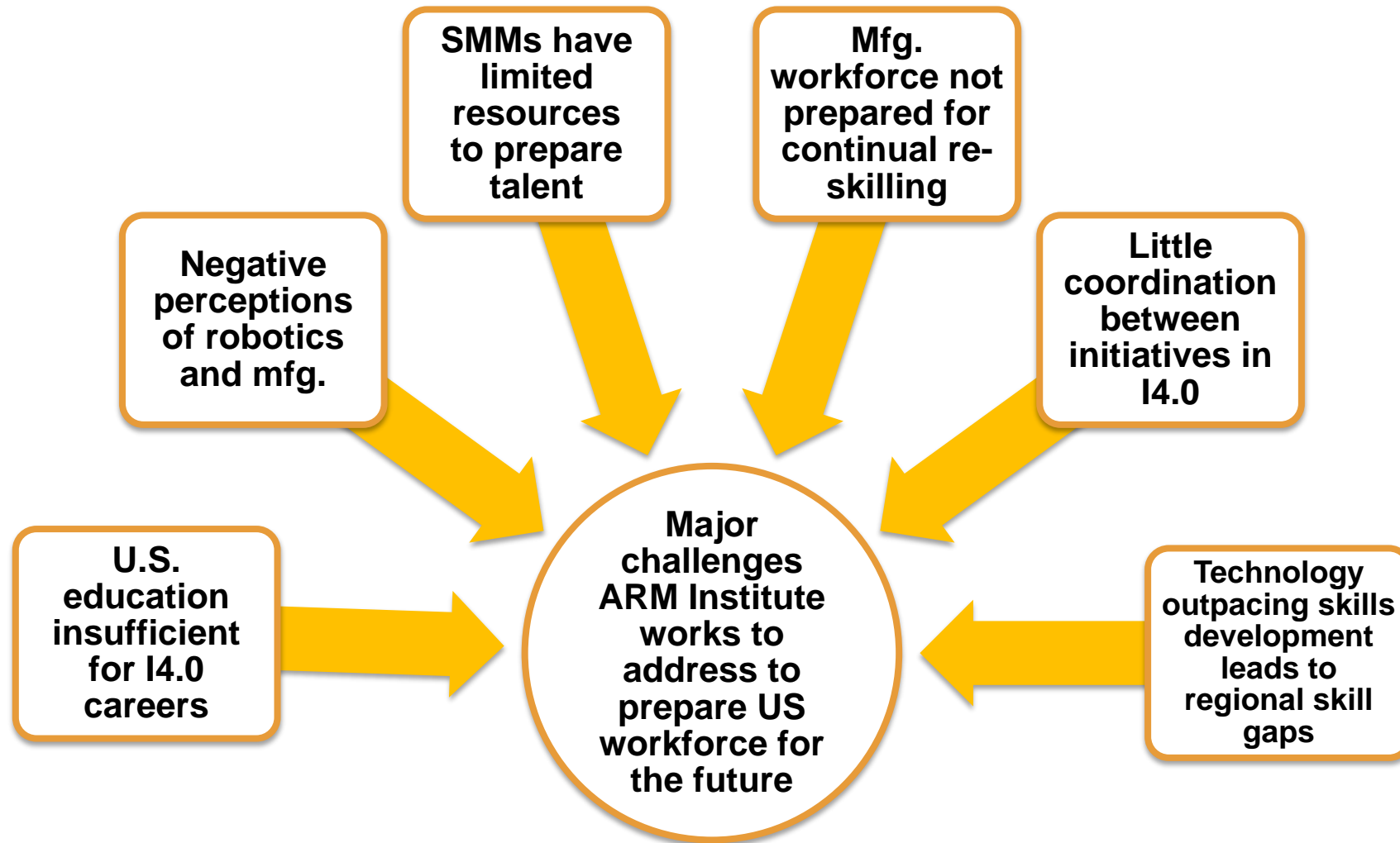
**Elevate our  
national security  
and resilience**

# AGENDA

- **Workforce Challenges in Manufacturing**
- **ARM Institute Strategy and Services**
  - Roboticscareer.org  
Endorsement Program
- **Leveraging the Resources**
  - Provide information on job opportunities to your students and alumni
  - Promote your programs to a broad audience
  - Get your program(s) endorsed



# Education and Workforce Development Challenges



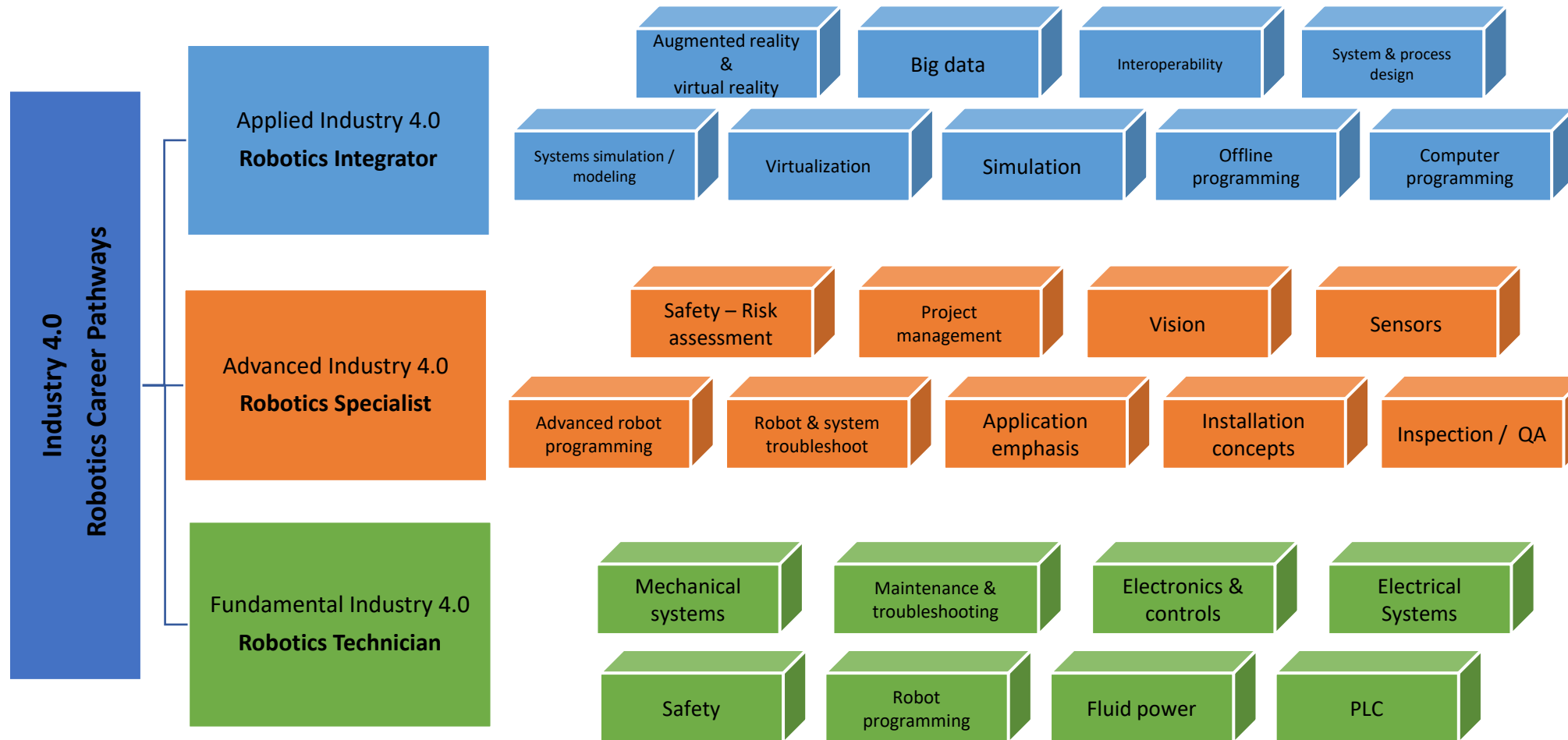
# Robotics Career Challenges

- ✓ No single national capability **promoting robotics careers** in manufacturing
- ✓ No single national capability to **find** programs that teach the competencies and skills required for a successful manufacturing robotics career
- ✓ Need for a common language and terminology for needed competencies, required skills, job titles and descriptions
- ✓ No easy way to identify which programs are **best suited** to help education seekers prepare for a robotics career in manufacturing
- ✓ No easy way for employers and education providers to identify and respond to each other's **needs** to strengthen their respective businesses
- ✓ No easy way to recognize the **“best of the best”** in robotics educational programs



# Robotics Competency Framework

## Essential Soft Skills



Critical Thinking

Teaming

Problem Solving

Technology Aptitude

Leadership

Conflict Resolution

Adaptability

Attention to Detail

Technical Learning Ability

Active Listening

Interpersonal

Communications

Time Management

Work Ethic



# Robotics Career Pathways



## Robotics Technician

Robotics Technicians are focused on the day-to-day maintenance on the manufacturing floor. This exciting entry-level position is perfect for starting your career in robotics for manufacturing.



## Robotics Specialist

Robotics Specialists are the subject matter experts on robotic systems on the manufacturing floor and are responsible for proposing upgrades to the systems that can increase productivity. This position requires more training than the Robotics Technician role.



## Robotics Integrator

The Robotics Integrator is the subject matter expert on automation and robotics. The Integrator understands how applying robots and automation to the manufacturing floor benefits their operations and will evaluate, design, and implement plans for areas ripe for automation. Of the three positions, the Robotics Integrator requires the highest level of training and experience.

# The Robotics Career Roadmap





## What is RoboticsCareer.org?

**RoboticsCareer.org**, powered by the ARM Institute, is the only national capability that highlights robotics training that has been vetted by industry experts and connects education seekers – both students and existing workers - with training aligned to their desired career pathway.



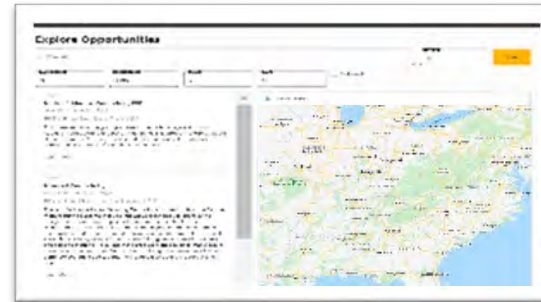


# Roboticscareer.org National Capability Platform, Content & Endorsements



## Online Platform

- Designed for employers, education and job seekers, and education providers
- Maps advanced manufacturing robotic competencies to career pathways and education programs and job opportunities
- Freely available



## Content

- Helps employers, education and job seekers find the resources in their region and nationally
- Information on 16,700+ training programs from 2,500 organizations today
- Over 3000+ job opportunities in robotics in manufacturing



## Endorsement of Robotic Programs

- Audit to provide validation & endorsement
- Identifies and promotes best programs
- ARM **“Seal of Approval”**
- Access to community of practice

# Aligning the Needs of All Stakeholders



**Job Seekers & Students**



**Employers & Manufacturers**



**Training Providers**

***Searchable public resource with information on over 16,700 training programs and over 3000 job opportunities in robotics in manufacturing***

# Roboticscareer.org is Unique

- ✓ Focus on job opportunities and training for robotics in manufacturing
- ✓ Identifies robotics education/training programs from badges to PhDs
- ✓ Based on competencies and skills needed within industry
- ✓ Endorses training programs that meet consortium-defined requirements
- ✓ Recognized as a national capability from a national institute

# All Types of Education / Training Providers

Advanced Manufacturing Certification Program

K-12 Charter School for Technology

Advanced Manufacturing Training Facility

K-12 Public School

Apprenticeship Program

Manufacturing Recruiting/Training Organization

Community College

Private College or University

Economic Development Program

Public College or University

For-Profit Advanced Manufacturing Training Program

Robotic Manufacturer

For-Profit Training Organization

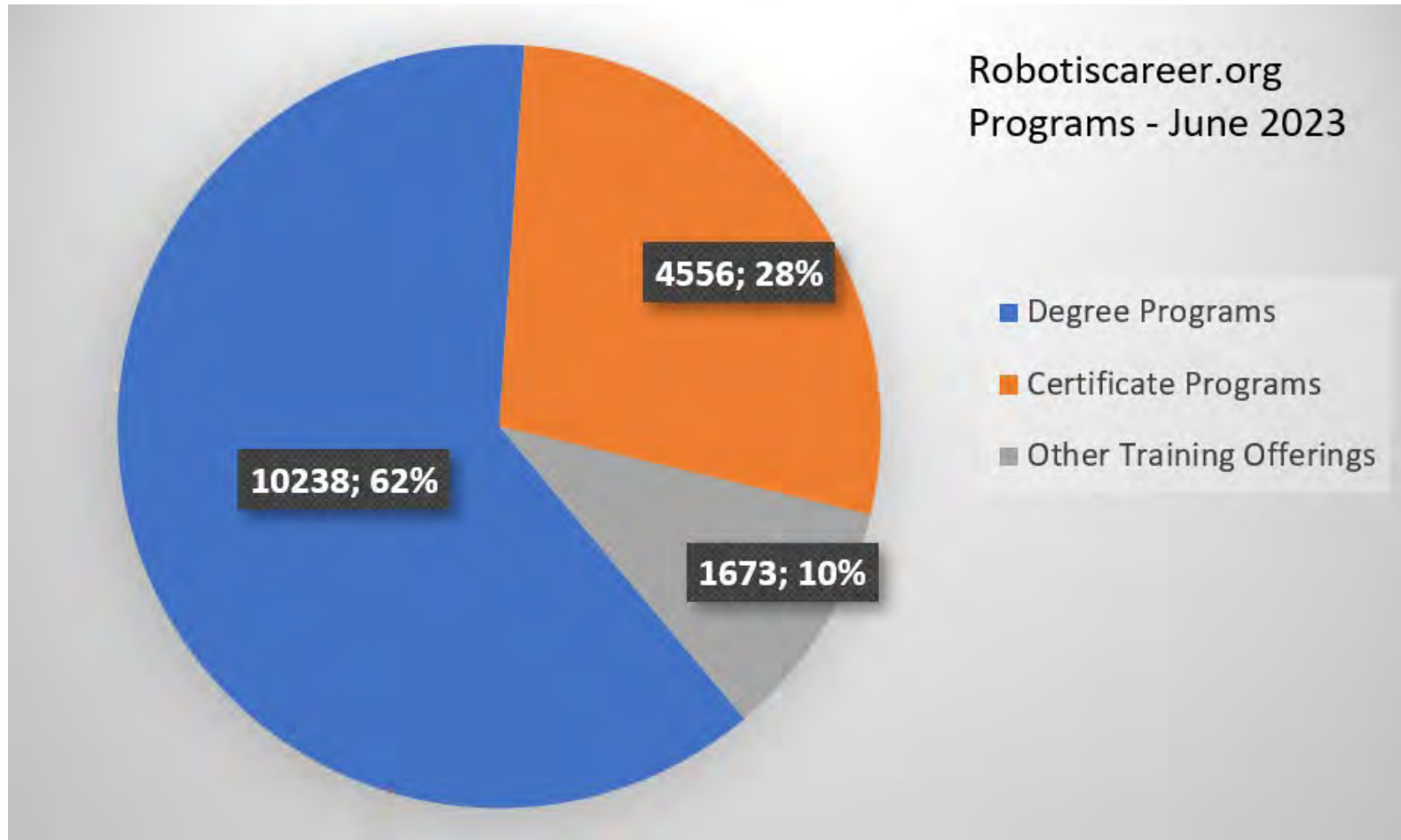
STEM/STEAM Program

Historically Black College or University

Technical College



# Number of Education / Training Programs Listed on Robotiscareer.org












## ARM Endorsement Overview

In partnership with our industry, academic, and government partners, the ARM Institute has created an Endorsement Program to recognize programs that meet the highest standards set by the robotics industry and align with the ARM Institute Competency Framework and Robotic Career Pathways.

# The Value of Endorsement

	Endorsement Only	All Programs
<b>Priority Listing</b> Show up first in search results and get high-value leads		
<b>Get a Detailed Report on your Program(s)</b> Through our Endorsement review, industry experts will evaluate your program and help you to identify potential gaps		
<b>Promote Your Endorsement</b> Use the ARM Endorsement Logo in your digital and print communications		
<b>Connect with an Interested Audience</b> Programs listed on our site align with our competency framework, helping education seekers find the right career pathway and education solution for their goals		
<b>Build the Workforce of the Future</b> The ARM Institute collaborated with the Dept. of Defense to create this workforce solution - get involved in this effort to build a trained manufacturing workforce.		

# Evaluation Overview



## 1. Relevance to the Industry:

Applies directly to the ARM Institute's Career Pathways of Robotic Technician, Specialist or Integrator, reflects current industry standards, and creates programs including industry input.



## 2. Effective Curriculum:

Training effectively prepares individuals for industry employment using recent technology as foundation for hands-on learning.

- Evidence of assessment of both knowledge and skill.
- Statistical data is collected regarding student performance, placement, and program value.
- Accreditation has been received by a government-authorized agency.



## 3. Efficiency of the Training:

Industry-valued credentials are earned and opportunities for scholarship/supplements are available



## 4. Impact of the Program:

Local industry and workforce populations are impacted by the program, including diverse populations.



## 5. Program Sustainability:

Procedures exist to ensure financial security, fiscal responsibility, program updating, and professional development of instructors.



## 6. Transportability:

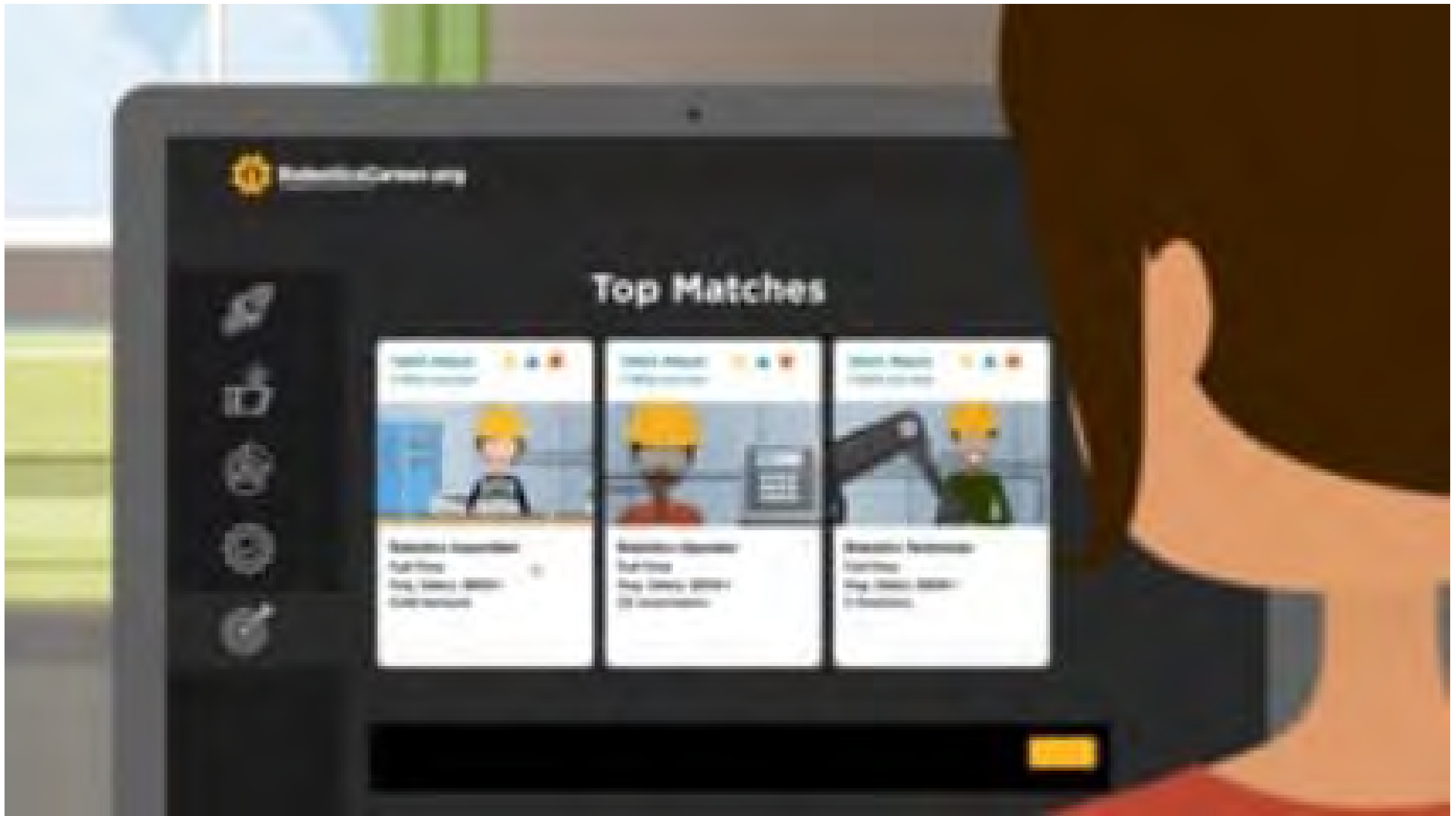
Evidence of articulation of credentials earned and acceptance of previously earned credentials for program credit.



# Our Endorsement Auditors are Industry Experts

The ARM Institute uses industry experts from our membership consortium to evaluate programs.





# Connects Job Seeker with Personalized Job Matches

The image shows the top portion of the RoboticsCareer.org website. The header is dark with the logo on the left and navigation links on the right. The main hero section features a large, bold title over a background image of a robotic arm in a factory setting.

**RoboticsCareer.org**  
POWERED BY ARM INSTITUTE

Find Jobs Find Training Programs ▾ Resources ▾ Sign In **Sign Up** 🔍


# Jumpstart Your Robotics Career in Manufacturing

Whether you are just starting out or taking your next step, find your training match here.

**Help Me Find Training or Jobs**

Find Training on My Own Search Jobs on My Own

# See Relevant Job Matches



RoboticsCareer.org  
POWERED BY ARM INSTITUTE

Find Jobs

Find Education


For Organizations

Log In


Sign up

×


Close




My Goal




My Preferences




My Interests



My Skills




My Competencies



My Matches

82% Match

17 Skills you have



Robotics Technician

Full Time | \$90K - \$100K


Robotics Corporation

Pittsburgh, PA

View Programs to close the gap

74% Match

10 Skills you have



Advanced Robotics Job 2

Full Time | \$90K - \$100K


Robotics Corporation

Pittsburgh, PA

View Programs to close the gap

60% Match

7 Skills you have



Advanced Robotics Job 3

Full Time | \$90K - \$100K

Robotics Corporation

Pittsburgh, PA


View Programs to close the gap

View all 57 job matches

View 3 career paths that match your skills

Sign Up to save and apply to your matches, get access to exclusive industry jobs and training, and get notified of future opportunities.

Sign Up



RoboticsCareer.org  
POWERED BY ARM INSTITUTE






Manage My Matches



John Zappa

 Director of Product

Management

 Chicago, IL


Profile

My Saved Training Programs

My Saved Jobs

Documents

Preferences

Account Settings 

## My Saved Jobs

Saved

Contacted

55% Match | 2 skills preferred.



### Applications Engineer - Robotic Machine Tools

Full-Time | \$80,000 - \$120,000

Moreno Division - Diedre Moire

Topeka, Kansas

Date Posted: 05/09/2023

Deadline to Apply:

50% Match | 2 skills preferred.



### Mechatronics Engineer

Full-Time | \$90,000 - \$95,000

HiFyve

Plymouth, Michigan

Date Posted: 04/13/2023

Deadline to Apply:

90% Match | 3 skills preferred.



### Senior Robotics Engineer: Mechanical

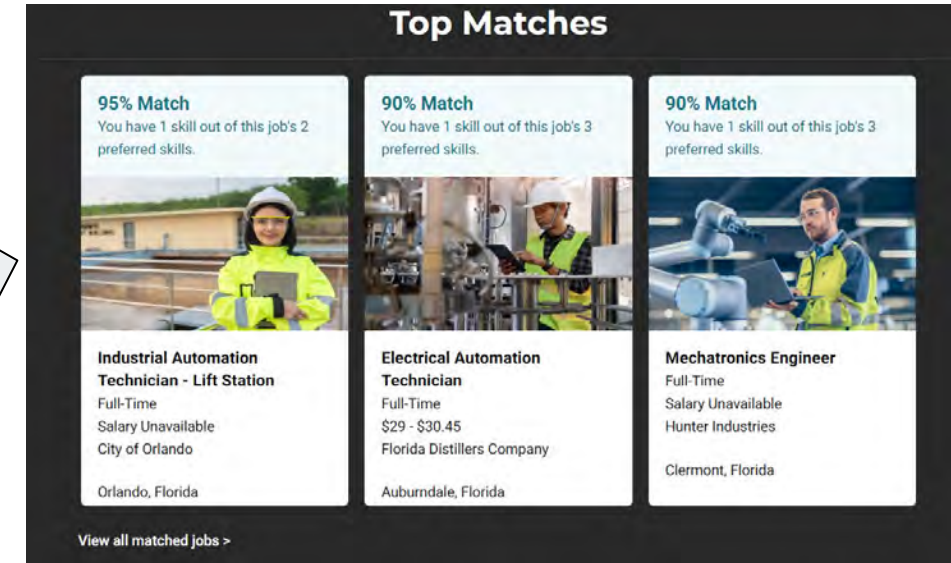
Full-Time | Salary Unavailable

Institute for Human and Machine Cognition




Pensacola, Florida

# Outcomes for Employers

- Recruit talent with relevant Industry 4.0 skills in robotics and manufacturing
- Upskill existing workforce through access to qualified and ARM-endorsed training programs
- Create job listings based on needed competencies for advanced manufacturing
- Connect individuals with personalized job matches



**Top Matches**

95% Match	90% Match	90% Match
You have 1 skill out of this job's 2 preferred skills.	You have 1 skill out of this job's 3 preferred skills.	You have 1 skill out of this job's 3 preferred skills.
		
<b>Industrial Automation Technician - Lift Station</b> Full-Time Salary Unavailable City of Orlando Orlando, Florida	<b>Electrical Automation Technician</b> Full-Time \$29 - \$30.45 Florida Distillers Company Auburndale, Florida	<b>Mechatronics Engineer</b> Full-Time Salary Unavailable Hunter Industries Clermont, Florida

[View all matched jobs >](#)



**RoboticsCareer.org**

Find Jobs Find Training Programs Resources

## Jumpstart Your Robotics Career in Manufacturing

Whether you are just starting out or taking your next step, find your training match here.

[Help Me Find Training or Jobs](#)

[Find Training on My Own](#) [Search Jobs on My Own](#)



# Wizard to Add New Job Postings

### Post a New Job

How would you like to build your post?\*

Start your post from scratch or select from our career-based templates below.

**Start from scratch**

Use our posting tool to customize your job ad.

**Robotics Technician Template**

Robotics Technicians are focused on the day-to-day maintenance on the manufacturing floor. This exciting, entry-level position is perfect for starting your career in robotics for manufacturing.

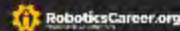
**Robotics Specialist Template**

Robotics Specialists are the subject matter experts on robotic systems on the manufacturing floor and are responsible for proposing upgrades to the systems that can increase productivity.

**Robotics Integrator Template**

The Robotics Integrator is the subject matter expert on automation and robotics. The Integrator understands how applying robots and automation to the manufacturing floor benefits their operations and will evaluate, design, and implement plans for areas ripe for automation.

Continue



HomeNew EmployerPost JobFind TalentOpen PositionsHelpContact Us

Robotics Technician

Step 1  
Job Details

Job Title

Robotics Technician

Post Date

11/02/2022

Expiry Date

11/02/2022

Job Type

Full Time

Job Category

Production

Save & Edit

Add


Address

MT 19 A 4501 Lytle St.

City/State

St Louis 200

# Employers Identify Candidates that Possess Needed Skills

 **RoboticsCareer.org**  
POWERED BY ARM INSTITUTE

JobsFind CandidatesUsersOrganization

## Find Candidates

Search by Position

Pennsylvania

All

More Filters

Search

**Bryan Jones**  
Robotics Engineer  
Pittsburgh, PA

✓ 62% Job Match  
✓ Applied to Position

✓ # of Matching Competencies  
✓ # of Matching Skills

**Kate Smith**  
Mechanical Engineer  
Pittsburgh, PA

✓ 80% Job Match  
✓ Saved Position

✓ # of Matching Competencies  
✓ # of Matching Skills

**Logan Tyler**  
Production Manager  
Pittsburgh, PA

✓ 57% Job Match  
✓ Matched Preferences

✓ # of Matching Competencies  
✓ # of Matching Skills

**Riley Thompson**  
Robotics Technician  
Pittsburgh, PA

✓ 98% Job Match  
✓ Matched Preferences

✓ # of Matching Competencies  
✓ # of Matching Skills

**Tyler Peters**



**Bryan Jones**  
Robotics Engineer  
Pittsburgh, PA

Contact CandidateSave Candidate

OverviewCompetencies & SkillsDocuments

Last Updated: 00/00/2021Date Applied: 00/00/2021

**About Me**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque vitae magna in urna hendrerit finibus. Integer convallis lacus vitae neque blandit rhoncus. Nunc ac nibh nisl. Integer tincidunt luctus rutrum. Suspendisse porttitor lorem eu nulla pulvinar, in molestie nisi feugiat. Fusce gravida neque at ullamcorper molestie. Donec et turpis non odio auctor scelerisque. Ut eu nibh laoreet, pharetra nulla ac, mollis dolor. Curabitur quam neque, iaculis rhoncus nulla sed, euismod congue nulla. Phasellus id feugiat nisi, sed ullamcorper augue. Pellentesque diam leo, maximus vel sagittis imperdiet, tincidunt vitae justo. Donec cursus lacus vel sem volutpat placerat. Aliquam erat volutpat.

**Experience**

**Military Job title**

Company Name  
Company Address  
timespan, if currently working  
Description, Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque vitae magna in urna hendrerit finibus. Integer convallis lacus vitae neque blandit rhoncus. Nunc ac nibh nisl. Integer tincidunt luctus rutrum.





**Mahima Arora** (She/Her) • 1st

Robotics Software Engineer @ Children's National Medical Center

4d • 🌐



Many Thanks to [Katelyn Turoski](#) for shedding light on my journey so far in the field of Robotics. Reading this article felt like taking a trip down the memory lane and your kind words mean a lot to me.

I also want to take this opportunity to highlight the **ARM Institute's** job search platform called **RoboticsCareer.org**. This remarkable site is a true game-changer for professionals like me, as it offers personalized job opportunities that align perfectly with our skills and aspirations.

It is highly useful to all professionals regardless of stage of their career, whether they are experienced professionals, fresh graduates, or even those considering a career transition. The platform stands ready to meet aspiring robotics enthusiasts assisting them in achieving their goals and realizing their dreams.

Thanks [John Zappa](#) for connecting me with Kate and for bringing attention to this valuable resource. I hope that many others will benefit from [RoboticsCareer.org](#) and embark on exciting and rewarding careers in the field of robotics!

Robotics Career Website : <https://lnkd.in/ecE29RpT>





# How You can Utilize Roboticscareer.org

- Education Provider
  - Get your programs listed and endorsed
  - Promote Roboticscareer.org as career resource to alumni
  - Encourage graduate to create free accounts
- Manufacturer/Employer
  - List your job opportunities in robotics
  - Specify preference for graduates of ARM Institute endorsed programs

# Your journey starts on RoboticsCareer.org.

Whether you're just getting started or looking for your next step.



**Training Program  
Database**



**Career Tracking &  
Exploration**



**Job & Internship  
Matching**



## Build your profile today to get started!

- Connects you to personalized job & internship matches based on your skills
- Matches you to training & upskilling opportunities to help you meet your goals
- Demystifies career pathways
- Gives you access to industry insights, tips and tricks, news, and events



**RoboticsCareer.org**

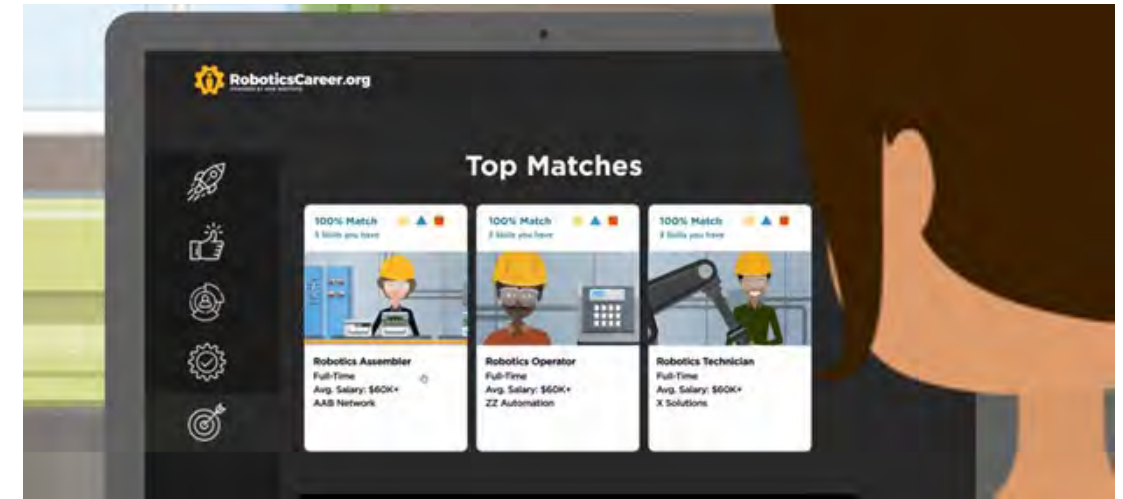
POWERED BY ARM INSTITUTE

# RoboticsCareer.org

## Create your account to get started!

Whether you are just starting out or taking your next step, find your next step on RoboticsCareer.org.

- **Match to a Job:** Get personally matched to job opportunities and connect to employers. RoboticsCareer.org uses a skills-based approach to find job opportunities that match directly to your skills.
- **Match to Training Programs:** Get personally matched to training programs that align to defined career pathways. Plus, explore Endorsed Training Programs to find industry-approved training.
- **Reach Your Goals:** Build your profile to analyze your skills. Learn about robotics career pathways in manufacturing and the training that can get you where you want to go. You may be closer to a higher-paying role than you think!



## Jumpstart Your Robotics Career in Manufacturing

Whether you are just starting out or taking your next step, find your training or job match here.

[Help Me Find Training or Jobs](#)

[Find Training on My Own](#)

[Search Jobs on](#)

# Resources to Help Your Institution!


Status: Job Matching has been publicly announced


Marketing Kit: Available in August

- Contains downloadable videos, email templates, hand-outs, sample social posts, presentations, and other assets
- Exclusive for Endorsed Programs: Co-Branded Infographics

### The Three Robotics Career Pathways in Manufacturing

Robots create new jobs in manufacturing, reducing the need for dangerous, dull, or dirty tasks. We've identified three distinct career paths for manufacturing robotics workers of all skill levels. Pick the path that's right for you!

 **Scan the QR Code to Learn More!**



### The ARM Institute Competency Building Blocks

The ARM Institute's Competency Building Blocks were created with input from nearly 400 member organizations, including industry, government, and educational institutions. These blocks outline the necessary robotics skills for Industry 4.0 careers and provide a pathway for workers to build on existing skills.

### Essential Skills Everybody Should Have

The ARM Institute's Essential Skills show the foundational skills needed for careers in manufacturing. These skills act as the foundation for any advanced manufacturing job.

✓ Active Listening	✓ Communication	✓ Time Management	✓ Leadership	✓ Technical Learning Ability
✓ Adaptability	✓ Conflict Resolution	✓ Work Ethic	✓ Problem Solving	✓ Technology Aptitude
✓ Attention to Detail	✓ Critical Thinking	✓ Interpersonal Skills	✓ Teaming	

#### Robotics Technician

A Robotics Technician is an entry-level position responsible for maintaining robots on the manufacturing floor. The Robotics Technician is the most hands-on job in the robotics career path. They operate, maintain, and fix robots on the manufacturing floor.

**Competencies**  
Maintenance & Troubleshooting  
Electrical Systems  
PLC (Programmable Logic Controllers)  
Electronics & Controls  
Robot Programming  
Mechanical Systems  
Fluid Power  
Safety (systems and Procedures)

#### Robotics Specialist

The Robotics Specialist is an expert on the manufacturing system and how its components work together to maximize productivity. They recommend redesigns to improve profitability. This job requires more robotics training than the Robotics Technician.

**Competencies**  
Inspection/QA  
Sensors  
Advanced Robot Programming  
Installation Concepts  
Application Emphasis  
Safety-Risk Assessment  
Vision  
Project Management  
Robot and System Troubleshooting


#### Robotics Integrator


The Robotics Integrator pathway requires the highest amount of training. They evaluate, design, and implement automation plans to improve manufacturing operations.


**Competencies**  
System and Process Design  
Augmented Reality/Virtual Reality  
Visualization  
Big Data  
Systems Simulation/Modeling  
Simulation  
Offline Programming  
Interoperability  
Computer Programming

**Find the Training You Need to Start Your Career Today!**  
Go to [roboticscareer.org](https://roboticscareer.org) to gain the additional skills you need!


**Great Places to Start**

 Certificate Programs

 Apprenticeships

 Endorsed Programs

**Explore career paths in robotics for manufacturing at [roboticscareer.org](https://roboticscareer.org)**

 **RoboticsCareer.org**

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# Questions

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  - <https://www.linkedin.com/in/maryellenrich/>
- John Zappa – [john.zappa@arminstitute.org](mailto:john.zappa@arminstitute.org)
  - <https://www.linkedin.com/in/johnzappa/>