



AI Workforce Development

Program Review

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Document Markings

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AI Workforce Development

Introduction



DoD is investing heavily in AI technologies and is currently supporting over 600 projects

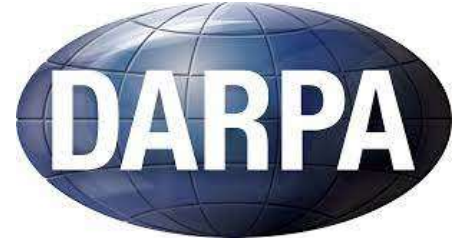


\$26 million



U.S. Department of Defense

\$874 million



\$1.5 billion (5 yr.)



\$196 million



Despite increase investments and developing policies to support AI, DoD is facing a massive skill shortage.

Job landscape

By 2025, new jobs will emerge and others will be displaced by a shift in the division of labour between humans and machines, affecting:

97 million



85 million

Emerging job demand

1. Data Analysis and Optimisation
2. AI and Machine Learning Specialist
3. High Data Specialist
4. Digital Marketing and Strategy Specialist
5. Process Automation Specialist
6. Business Development Professional
7. Digital Transformation Specialist
8. Cybersecurity Specialist
9. Software and Application Developer
10. Virtual Reality Specialist

Disappearing job demand

1. Data Entry Clerk
2. Administrative and Clerical Occupations
3. Accounting, Bookkeeping and Payroll Clerk
4. Accountants and Auditors
5. Assembly and Factory Worker
6. Business Services and Administrative Occupations
7. Cashier, Information and Customer Service Representative
8. Customer and Commerce Manager
9. Information and Telecommunications Occupations
10. Material Handling and Stocking Clerk

Source: LinkedIn Learning, 2022. <https://www.linkedin.com/learning/skills-forecast>

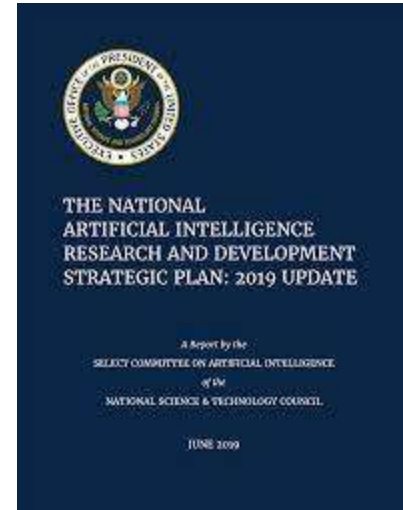


U.S. Policy to support National AI Education Strategy



“The Secretary of Defense shall develop a strategy for educating servicemembers in relevant occupational fields on matters relating to artificial intelligence”

“workforce development strategy strives to build an “AI-ready workforce” that is critical in not only leading AI R&D advances, but in maintaining global superiority in AI competencies”



Start with a small team to support the AI National Education strategy



Hollen Barmer



Robert Beveridge

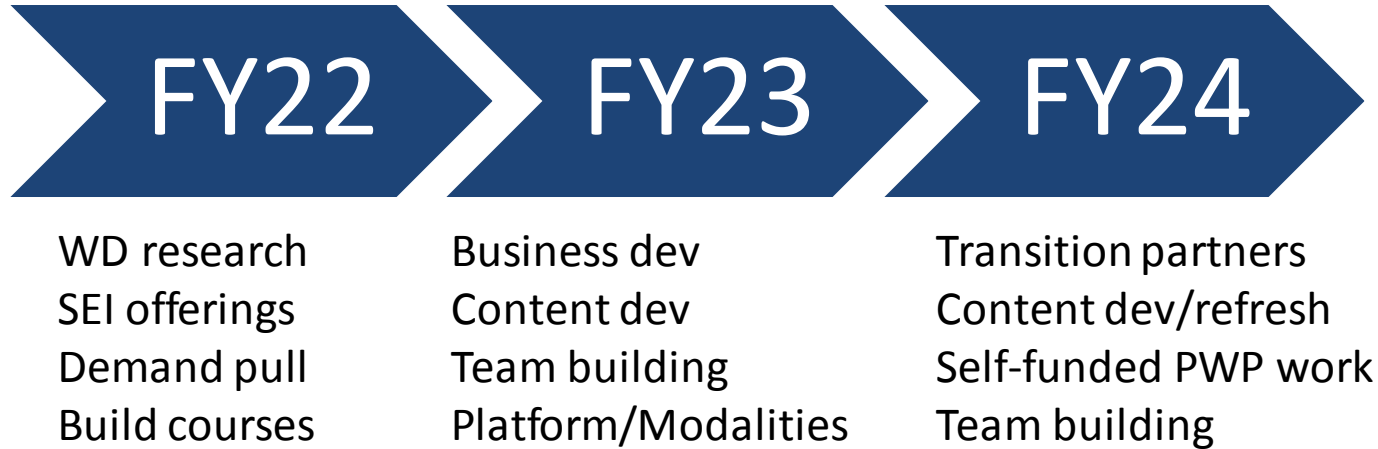


Rachel Dzombak



Nick Winski

Build what the AI division workforce development roadmap looks like



Research results show lots of opportunities to advance the DoD AI workforce education strategy



NICE
NATIONAL INITIATIVE FOR
CYBERSECURITY EDUCATION



NIST Framework
for AI education ?

Standardized Job descriptions

Sr. Machine Learning Scientist

- Conduct code review
- Develop and improve models
- Disambiguate requirements and convert them into success
- Effectively communicate data-driven findings

AI/ML Scientist

- Provide technical guidance and subject matter expertise
- Build predictive models and machine-learning algorithms
- Monitor and sustain model effectiveness
- Present complex information using data visualization techniques

Organize and publicize the coursework already developed and let the community provide feedback

- Show current Offerings
- Gather interest of future offerings
- Contact us





AI Workforce Development Initiative

AI Tradeschool

Course development Strategy

The Joint Artificial Intelligence Center (JAIC) developed the DoD AI Education Strategy to organize work roles and competencies



DoD AI EDUCATION STRATEGY

Cultivating an AI ready force to accelerate adoption



All six archetypes have competency topics and levels of understanding

Competency Topic	Competencies	B Basic	M Intermediate	A Advanced
1 Foundational Concepts	Understand AI, Apply AI, Advanced AI topics	<ul style="list-style-type: none"> Intro to AI/ML concepts Key Terms Neural Networks & Deep Learning Supervised / Unsupervised Learning Autonomy Current AI uses in DoD Data in AI 	<ul style="list-style-type: none"> Computer vision AI Robotics Natural Language Processing Speech Recognition 	<ul style="list-style-type: none"> Military applications of AI Learning algorithms and training models
2 AI Applications	ID trends, ID risks	<ul style="list-style-type: none"> Future AI Uses in DoD Cyber Risks & Vulnerabilities Bias in AI 	<ul style="list-style-type: none"> Technical Future AI Uses in DoD Identifying Cyber Risks & Vulnerabilities 	<ul style="list-style-type: none"> Doctrine Explainable AI Trust
3 Data Management & Visualization	Manage, prep, and visualize data	<ul style="list-style-type: none"> Data-Driven Decisions & Culture 	<ul style="list-style-type: none"> Visualization Tools Data Preparation for ML 	<ul style="list-style-type: none"> Data Engineering & Orchestration Data Warehousing
4 Responsible AI	Operate ethically	<ul style="list-style-type: none"> Responsible AI Use throughout DOD (Intro) 	<ul style="list-style-type: none"> Responsible AI Use throughout DOD 	<ul style="list-style-type: none"> Technical Issues in Responsible AI (e.g., measuring bias & fairness)
5 Infrastructure, Coding, & Software Development	Program, SW eng., cloud, computing, testing, DevSecOps, AI frameworks	<ul style="list-style-type: none"> Intro to Programming and Languages Intro to DoD DevSecOps 	<ul style="list-style-type: none"> Programming and Languages 	<ul style="list-style-type: none"> Software Development Cloud Engineering Distributed Computing AI Infrastructure AI Computing Platforms
6 Mathematics, Statistics, & Data Science	Performing analysis	<ul style="list-style-type: none"> Data Analysis Elements of Data Science Intro to Algebra and Calculus Statistics & Probability 	<ul style="list-style-type: none"> Algebra and Calculus Statistics & Probability Data Analysis 	<ul style="list-style-type: none"> Analytic & Empirical Methods Algebra, Linear Algebra, Calculus Predictive Analysis Principal Component Analysis Machine Learning Theory
7 AI Delivery	Manage prod. dev, delivery, strategy	<ul style="list-style-type: none"> DevOps Agile & Innovative Leadership Analytical Thinking 	<ul style="list-style-type: none"> Product Management Structure of AI Delivery Military Strategy with AI Tech 	
8 AI Enablement	User centric design, legal/IP rights	<ul style="list-style-type: none"> Design Thinking Data Rights, Property Rights, & Intellectual Property 	<ul style="list-style-type: none"> UI/UX Design 	

Curriculum depth: **B** Basic **M** Intermediate **A** Advanced

Developing ML Skills course for Lead AI –”Prioritize AI awareness for senior leaders”

Lead AI Concentration	Role description	Example MIL/CIV careers	Key differentiations in AI use
Policy	Create and write overarching guidance on AI use throughout DoD	OSD PSAs	<ul style="list-style-type: none"> • Plan for and guide future use cases of AI • Evolve strategy, doctrine, policy to account for use of AI
Command	Ensure AI policy is carried out by personnel they lead; make decisions that support AI use	CENTCOM CO	<ul style="list-style-type: none"> • Understand / internalize OSD guidance on AI • Lead the implementation of AI use throughout DoD
Agency / Function Lead	Ensure AI policy carried out in non-Combat roles	Director, Defense Health Agency	<ul style="list-style-type: none"> • Support to DoD combat organizations • Ensure use of AI to increase efficiency and effectiveness of operations

Developing ML Skills course for Employ AI, which is the largest of all archetypes

Employ AI Concentration	Role description	Example MIL/CIV specialties	Key differentiations in AI use
Operations	DoD Warfighter; combat-facing roles	Pilot, SWO, Infantry	<ul style="list-style-type: none"> AI strengthens warfighting / mission functions
Intelligence	Gathers and analyzes information to support decision-making	Intelligence analyst, Cryptology specialist, ISR manager	<ul style="list-style-type: none"> AI enables information gathering, analysis and reduces information delivery cycle time
Logistics and Maintenance	Enable troop / gear movement, maintain equipment	Maintainer, repairer, Procurement manager	<ul style="list-style-type: none"> AI supports distribution, sustainment, and maintenance needs
Health	Maintain health and wellbeing of the Warfighter	Medical, Doctor, Nurse, Medic	<ul style="list-style-type: none"> AI supports maintaining and improving welfare of DoD personnel
Support	Other focused support to the Warfighter	Legal, Personnel	<ul style="list-style-type: none"> AI used to support the warfighter

Lead AI and Employ AI archetypes require least amount of development effort while satisfying training needs for the focus areas

Competencies and levels per archetype

	Lead AI	Drive AI	Create AI	Embed AI	Facilitate AI	Employ AI
Basic	5	10	7	11	11	9
Intermediate	3	11	6	5	5	-
Advanced	-	1	8	5	-	-
Totals	8	22	21	21	16	9

Completing Lead AI modules will also satisfy most of Employ AI training requirements

Completion % once Lead AI is built

	Lead AI	Drive AI	Create AI	Embed AI	Facilitate AI	Employ AI
Total Modules	8	22	21	21	16	9
Common Modules	8	6	3	6	5	6
% of course designed	100.00%	27.30%	14.30%	38.10%	37.50%	77.80%

How AI Engineering pillars apply to Lead AI archetype competencies

Lead AI			
Competency	Human Centered AI	Robust and Secure AI	Scalable AI
Foundational	X	X	X
AI Applications: Opportunities and risk		X	
Data Management and Visualization	X	X	X
Responsible AI	X		
AI Delivery			X
AI Enablement			

How AI Engineering pillars apply to Employ AI archetype competencies

Employ AI			
Competency	Human Centered AI	Robust and Secure AI	Scalable AI
Foundational	X	X	X
AI Applications: Opportunities and risk		X	
Data Management and Visualization	X	X	X
Responsible AI	X		
AI Enablement	X		

How AI Engineering pillars apply to Data and tactical pipeline course competencies

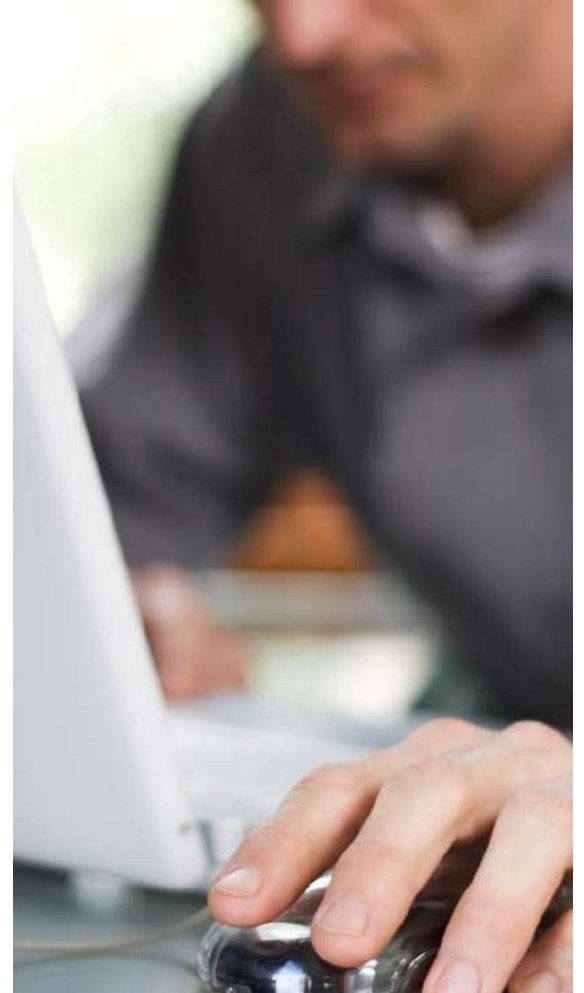
ML Tactical Data Pipeline Course*

Competency	Human Centered AI	Robust and Secure AI	Scalable AI
Foundational	X	X	X
AI Applications: Opportunities and risk		X	
Data Management and Visualization	X	X	X
Responsible AI	X		
Infrastructure, Coding, & Software Development		X	X

*Modified Employ AI

AI Workforce Development Initiative

Future State



Business strategies that will inform the community of the AI WD initiative

Customer Outreach



Program Development



Blogs and Conferences



New ideas - Solocasts

Q&A

Thanks!

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