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Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

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Comment on FR Doc # 2025-07332

Submitter Information

Name: Keith Brawner

General Comment

Use Orlando Regional Simulation Talent to create shared simulations for AI applications

Attachments

OSTP RFI 1 Orlando as an Simulation Hub

Utilizing Orlando as a Hub for Modeling and Simulation in Support of AI Development

by Keith Brawner (AI PhD), and friends

Keith works for the Army but is certainly not representing the Army in this essay and just a helpful citizen

Introduction

The establishment of Orlando as a sub-hub for modeling and simulation (M&S) is a strategic move that leverages the existing defense industrial base, national supercomputing infrastructure, and the expertise of organizations such as the Army's DEVCOM Soldier Center's Simulation and Training Technology Center (STTC), Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI), and the Naval Air Warfare Center Training Systems Division (NAWCTSD), and broadly "Team Orlando". This initiative aligns with the broader goals outlined in the National Artificial Intelligence Research and Development Strategic Plan and the Executive Order on Removing Barriers to American Leadership in Artificial Intelligence. By focusing on large-scale military applications, such as spacecraft, self-flying helicopters, self-driving tanks (Next Generation Combat Vehicle), and other advanced capabilities, Orlando can become a serve as a center for AI-driven innovation across the sectors requested in the RFI. All of the sectors requested in AI depend upon two things (1) large-scale, highly-detailed, simulation and (2) compute resources to run it on. Orlando produces one of these things, NSF has access to the second. Future development shouldn't depend on the reinvention of a simulation, but on the utilization of simulation resources across many projects.

Leveraging the Defense Industrial Base

Orlando is home to a robust defense industrial base, including key organizations like STTC, PEO STRI, and NAWCTSD. These entities have a long history of developing cutting-edge simulation and training technologies for the U.S. military. By building on this foundation, the proposed M&S hub can accelerate the development of advanced military applications.

STTC: The Simulation and Training Technology Center focuses on research and development in simulation technologies, providing a strong foundation for the proposed hub. STTC's expertise in creating realistic training environments can be extended to develop simulations for autonomous military systems, which additionally leverages the Institute for Creative Technologies University Affiliated Research Center (ICT UARC) at the University of Southern California, which provides modeling and simulation technologies across the Department of Defense.

PEO STRI: The Program Executive Office for Simulation, Training, and Instrumentation manages a wide range of simulation and training programs for the Army. PEO STRI's experience in integrating complex systems and managing large-scale projects will be invaluable in developing simulations for next-generation military applications.

NAWCTSD: The Naval Air Warfare Center Training Systems Division specializes in training systems for the Navy and Marine Corps. NAWCTSD's capabilities in creating high-fidelity simulations for air and sea platforms can be leveraged to develop simulations for autonomous systems, such as self-flying helicopters and unmanned naval vessels.

UCF: The University of Central Florida is a leading institution in the field of modeling and simulation, offering extensive research capabilities and state-of-the-art facilities. UCF's strong emphasis on interdisciplinary research and collaboration positions it as a key player in advancing simulation technologies and developing innovative solutions for complex problems.

IST: The Institute for Simulation and Training at UCF is dedicated to advancing the science and application of simulation, training, and virtual reality technologies. IST's expertise in creating realistic training environments and conducting cutting-edge research can be leveraged to develop advanced simulations for autonomous systems and other military applications.

IHMC: The Institute for Human and Machine Cognition, with base of operations in Ocala, FL, is dedicated to advancing human-centered AI and robotics technologies. IHMC's expertise in developing human-machine interfaces and enhancing human performance can be leveraged to create advanced autonomous systems and improve the integration of AI technologies in military applications.

Utilizing National Supercomputing Infrastructure

The national supercomputing infrastructure provides the computational power necessary to run large-scale simulations and develop advanced AI algorithms. LLNL, By integrating this infrastructure into the Orlando M&S hub, we can ensure that the simulations are both high-fidelity and scalable. The National Supercomputing Infrastructure (OLCF, ALCF, El Capitan, NERSC, NCSA, etc.) is already invested in, and the capabilities described above are mostly invested in; linking the two together can result in additional capabilities across all forms of AI training.

Developing Large-Scale Applications

The proposed M&S hub in Orlando will expand the focus from large-scale military applications to many applications relevant to OSTP/NSF, leveraging the capabilities of simulations to create advanced autonomous systems. By modeling the functionality of companies like Tesla and Waymo, we can apply their successful strategies to military applications. This includes

Spacecraft: Simulations can be used to develop and test autonomous spacecraft, ensuring that they can navigate and operate in space without human intervention. This capability is essential for future space missions and national security.

Self-Flying Helicopters: By simulating various flight scenarios, we can develop AI algorithms that enable helicopters to fly autonomously. These self-flying helicopters can be used for reconnaissance, transport, and combat missions, reducing the risk to human pilots.

Self-Driving Tanks (Next Generation Combat Vehicle): Simulations can help develop autonomous tanks that can navigate complex terrain and engage in combat without human intervention. These self-driving tanks will enhance the military's capabilities and improve battlefield effectiveness.

Other Autonomous Systems: The M&S hub can also focus on developing other autonomous systems, such as unmanned naval vessels, drones, and robotic ground vehicles. By leveraging simulations, we can ensure that these systems are reliable, efficient, and capable of operating in various environments.

Modeling the Functionality of Tesla and Waymo

Tesla and Waymo have demonstrated the effectiveness of using simulations to develop autonomous driving technologies. Luminar Technologies chose to headquarter in Orlando for the reason of leveraging the existing M&S base and sensor manufacturing base in order to develop cross-company compatible self-driving car technologies. By modeling their approaches, the Orlando M&S hub can apply similar strategies to both military and civilian applications. The simulation-specific applications include:

Data Generation and Labeling: Simulations can generate large amounts of labeled data, which is essential for training AI algorithms. By creating photorealistic environments that mimic real-world scenarios, we can ensure that the AI systems are well-prepared for real-world operations.

Handling Complex Scenarios: Simulations can be used to create and test complex scenarios that are difficult to replicate in real life. This capability is crucial for developing AI systems that can handle rare and challenging situations, such as navigating through hostile environments or responding to unexpected threats.

Sensor Fusion and 3D Mapping: By integrating data from multiple sensors, simulations can create a comprehensive understanding of the environment. This capability is essential for

developing autonomous systems that can navigate and operate effectively in various conditions.

Reinforcement Learning: Simulations support reinforcement learning, where AI systems learn by interacting with a simulated environment. This approach allows us to test and refine AI algorithms in a safe and controlled setting, ensuring that they are robust and reliable.

Real-World Validation: While simulations are essential for initial development, real-world data is crucial for validating and refining AI systems. By combining simulations with real-world data, we can ensure that the AI systems are accurate and effective in real-world operations.

Producing Software for Supercomputing Resources

The Orlando M&S hub will focus on developing software that can run on supercomputing resources, ensuring that the simulations are both high-fidelity and scalable. This software will be essential for developing and testing advanced AI algorithms for various applications. This includes:

Scalable Simulation Software: The hub will develop simulation software that can scale to run on supercomputing resources, ensuring that the simulations are both accurate and efficient. This capability is essential for handling the large datasets and complex scenarios required for developing autonomous systems.

AI Algorithm Development: The hub will focus on developing AI algorithms that can leverage the computational power of supercomputers. These algorithms will be essential for training and testing autonomous systems, ensuring that they are reliable and effective.

Integration with National Supercomputing Infrastructure: The software developed by the hub will be designed to integrate seamlessly with the national supercomputing infrastructure, ensuring that resources are used efficiently and effectively. This integration will facilitate collaboration and resource sharing, accelerating the development of new technologies.

Level Playing Field for Innovation: The Modeling and Simulation Hub can serve as a level playing field for new companies, ideas, proposals, and other items which will be proposed to DARPA, NSF, DOE, and other agencies. By providing a collaborative environment and access to advanced resources, the hub can foster innovation and support the development of groundbreaking technologies.

Making Simulations Operational

The Orlando M&S hub will focus on making simulations operational by developing and implementing advanced technologies for various applications. This includes leveraging the expertise of companies like Lockheed Martin (Missiles and Fire Control) and SpaceX (autonomous landing), as well as exploring new frontiers in robotics (IHMC) and command and control systems (Army systems, robotaxi fleets).

Lockheed Martin Missile Control: Simulations can be used to develop and test advanced missile control systems, ensuring that they are accurate and reliable. By creating realistic scenarios, we can train AI algorithms to handle complex missile guidance and targeting tasks, improving the effectiveness of missile defense systems.

SpaceX Autonomous Landing: Simulations can help develop and refine autonomous landing technologies for spacecraft, such as those used by SpaceX. By simulating various landing scenarios, we can ensure that the AI systems are capable of performing precise and safe landings, even in challenging conditions.

Robotic Implementations: The M&S hub can focus on developing and testing robotic systems for various applications, including military, industrial, and healthcare. By leveraging simulations, we can ensure that these robotic systems are reliable, efficient, and capable of performing complex tasks autonomously. IHMC currently has work in embodied robotics which could be accelerated with national-level compute resources and simulation.

Next Generation Command and Control: Simulations can be used to develop advanced command and control systems that integrate AI and machine learning technologies. These

systems can enhance decision-making capabilities, improve situational awareness, and enable more effective coordination of military operations. The Army Cross Functional Team is one of the major Army capability development areas for future warfighting.

Fleet Management: Simulations can help develop and optimize fleet management systems for autonomous vehicles, including ground, air, and sea platforms. By simulating various operational scenarios, we can ensure that the AI systems are capable of managing and coordinating large fleets of autonomous vehicles effectively. This is highly relevant to Uber and the emerging self-driving taxi/vehicle industry, represented with Orlando-local companies like Beep.

Conclusion

Expanding Orlando as a hub for modeling and simulation by creating an open and level playing field for future AI development is a strategic move that leverages the existing defense industrial base, national supercomputing infrastructure, and the expertise of organizations like STTC, PEO STRI, NAWCTSD, UCF, IST, USC ICT UARC, and IHMC. By focusing on large-scale military and civilian applications, modeling the functionality of companies like Tesla and Waymo, and utilizing the national supercomputing infrastructure, the proposed M&S hub can drive AI-driven innovation in defense and beyond. This initiative aligns with the broader goals outlined in the National Artificial Intelligence Research and Development Strategic Plan and the Executive Order on Removing Barriers to American Leadership in Artificial Intelligence, ensuring that the United States remains at the forefront of AI research and development.

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Submitter Information

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General Comment

Use the DoD UARCs technologies as a transition vector

Attachments

OSTP RFI 2 Use the UARCs

Leveraging the Existing DoD Defense Enterprise to Accelerate National AI Programs

by Keith Brawner (AI PhD), and friends

Keith works for the Army but is certainly not representing the Army in this essay and just a helpful citizen

Introduction

Artificial Intelligence (AI) is a transformative technology with the potential to revolutionize national security, economic competitiveness, and societal well-being. The Office of Science and Technology Policy (OSTP) and the National Science Foundation (NSF) play crucial roles in advancing AI research and development in the United States. To accelerate national AI programs, it is imperative to leverage the existing infrastructure, expertise, and resources within the Department of Defense (DoD) Defense Enterprise. This RFI response details how and why OSTP and NSF could utilize the DoD's University Affiliated Research Centers (UARCs) and other defense assets (FFRDCs, Army AI2C) to drive AI innovation and maintain the United States' leadership in AI.

Leveraging the DoD Enterprise

The DoD Enterprise encompasses a vast network of research institutions, laboratories, and centers dedicated to advancing military technology and capabilities. This enterprise is uniquely positioned to contribute to national AI programs due to its extensive experience in high-risk, high-reward research, and its ability to rapidly transition technologies from research to operational use. It was created to solve these problems with **rapid-award sole-source type contracts** inside of their areas, which can be utilized by broader federal government. As an example, the ICT UARC will provide advanced simulation for training to the FAA for air traffic controllers due to recent incidents.

The DoD's investment in AI research has led to significant advancements in areas such as autonomous systems, natural language processing, and machine learning. By leveraging the DoD Defense Enterprise, OSTP and NSF can tap into this wealth of knowledge and resources to accelerate AI research and development. This collaboration can also ensure that AI technologies developed for national security purposes are adapted for broader applications, benefiting society as a whole.

The Role of University Affiliated Research Centers (UARCs)

University Affiliated Research Centers (UARCs) are a critical component of the DoD Defense Enterprise. These centers are established through partnerships between the DoD and leading academic institutions, providing a bridge between academic research and practical applications. UARCs are uniquely positioned to conduct long-term, high-risk research that addresses the DoD's strategic needs while also contributing to the broader scientific community. UARCs possess unique core competencies that set them apart from other research institutions. These competencies include advanced simulation and training technologies, human-machine interaction, and AI-driven decision support systems. By leveraging the expertise and capabilities of UARCs, OSTP and NSF can

accelerate the development and deployment of AI technologies that address both national security and civilian needs.

Institute for Creative Technologies (ICT)

The Institute for Creative Technologies (ICT) at the University of Southern California is a prime example of a UARC that has made significant contributions to AI and simulation technologies. ICT's work in virtual and augmented reality, natural language processing (NLP), and simulation-based, AI-driven training tools has had a profound impact on both military and civilian applications. ICT's research in natural language understanding and human-computer interaction has provided valuable insights that have informed the development of advanced AI models. One notable connection between ICT and AI is its role in the development of ChatGPT, where the foundational research (Attention is All You Need paper, 12000+ citations) was performed.

ICT's contributions extend beyond NLP. The center has developed immersive training environments that use AI to provide personalized training experiences for soldiers. These environments leverage advanced simulation technologies to create realistic scenarios that enhance training effectiveness and operational readiness. By integrating AI into military training tools, and back into the simulations for AI-training tools, ICT has already demonstrated the potential of AI to transform military training and operations. ICT also trained Palmer Luckey, who founded Oculus VR (acquired by Facebook for \$2B), and who is now leading Anduril.

Carnegie Mellon University (CMU) Software Engineering Institute (SEI FFRDC) and the AI2C

Carnegie Mellon University (CMU) is another leading institution in AI research, home to the Army's AI2C (Artificial Intelligence and Integration Center). The Army's AI2C, in cooperation with the DoD's Software Engineering Institute FFRDC at CMU, has made significant contributions to AI research, particularly in areas such as robotics, machine learning, and autonomous systems. This is directly through AI2C support to the Army's Project Lynchpin and items such as the CamoGPT Army-wide Large Language Model prototyping efforts.

The AI2C's research also extends to AI-driven decision support systems, which provide commanders with real-time insights and recommendations based on vast amounts of data. These systems leverage machine learning and data analytics to enhance decision-making processes, ensuring that military leaders have the information they need to make informed decisions in complex and dynamic environments for items such as logistics, targeting, and others.

Other UARCs Nationwide

In addition to ICT and CMU/AI2C, there are several other UARCs across the nation that contribute to AI research and development. These centers bring together interdisciplinary teams of researchers, technologists, and military experts to address the DoD's strategic needs and advance the state of the art in AI. For example, the Georgia Tech Research Institute (GTRI) UARC has efforts in Artificial intelligence (AI) for national security, resilient cyber-physical systems, decision superiority at the contested edge, AI-based electromagnetic spectrum operations, and integrated autonomy.

Another notable UARC is the Applied Physics Laboratory (APL) at Johns Hopkins University, which conducts research in AI, cybersecurity, and autonomous systems. APL's work in AI-driven

cybersecurity solutions is particularly relevant in today's digital age, where cyber threats pose significant risks to national security. By leveraging AI to detect and respond to cyber threats, APL is helping to protect critical infrastructure and ensure the security of military and civilian networks.

The University of Maryland Applied Research Laboratory for Intelligence and Security has efforts in AI not disclosed within this RFI response.

Conclusion

The DoD Enterprise, with its network of UARCs, FFRDCs, and research institutions, is uniquely positioned to accelerate national AI programs. By leveraging the expertise and resources of DoD centers like USC's ICT, CMU's AI2C, GTRI, APL, UMD:ARL, OSTP and NSF can drive AI innovation and ensure that the United States remains at the forefront of AI research and development. Early-stage technologies can be taken, handed off, accelerated, and transitioned back to industry, academia, or national purposes. These collaborations can lead to the development of advanced AI technologies that address both national security and civilian needs, from autonomous systems and natural language processing to AI-driven decision support and cybersecurity solutions. Encouraging the use of the existing rapid contract vehicles possessed by UARCs and FFRDCs allows the executive branch to have directive efforts involved in utilizing or performing advanced research for the national interest, and springboarding a technology before industrial scaling.

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General Comment

Scale up educational AI for the broader workforce

Attachments

OSTP RFI 3 Scale Educational AI

Addressing Workforce Problems with AI Tools and Partnerships

by Keith Brawner (AI PhD), and friends

Keith works for the Army but is certainly not representing the Army in this essay and just a helpful citizen

Introduction to AI-created Workforce Problems

The United States faces significant workforce challenges, particularly at the high school level, which threaten its economic competitiveness and national security. These challenges include skill gaps, educational deficiencies, and a lack of preparedness for the rapidly evolving job market. The Department of Defense (DoD) shares similar concerns, as it continuously grapples with training and upskilling its workforce, especially the newly hired, to meet the demands of modern warfare and technological advancements. Addressing performance preparedness is crucial to both the civilian and military sectors to maintain the nation's strategic advantage.

Availability of AI Tools to solve AI-related Workforce Problems

The University of Southern California's (USC) Institute for Creative Technologies (ICT) Artificial Intelligence Research Center of Excellence for Education (AIRCOEE) is at the forefront of developing AI tools to address workforce problems by enhancing education and training. It was funded through Congressional plus-up to partner with the U.S. Army DEVCOM Soldier Center and (DEVCOM-SC) and U.S. Army University to deliver real-world solutions that move beyond the AI hype. The center's approach includes three key innovations, as endorsed as needed by Army University: Learning AI Using AI, AI-Accelerated Curriculum Updates, and Enhancing Critical Thinking with AI. They are detailed below:

PAL3 (Personal Assistant for Lifelong Learning): PAL3 is a mobile and web-based AI tutor that uses interactive dialogues and AI-generated hints to teach core AI concepts. It has been successfully deployed in military upskilling programs and is now being introduced to adult educators in the Los Angeles Unified School District (LAUSD). The system, branded as Game-If-AI, has received strong user feedback, with over 90% of students reporting increased understanding of AI. PAL3's ability to provide personalized learning experiences makes it an effective tool for enhancing AI literacy and skill acquisition.

ARC (AI-Assisted Revisions for Curricula): ARC is designed to speed up curriculum updates by flagging outdated material in military training documents. Initially planned for two sites, ARC has expanded to seven Army training centers and received overwhelmingly positive feedback for saving instructors valuable time. The tool also holds promise for civilian educators updating curricula in fast-evolving fields. By ensuring that training materials are current and relevant, ARC helps educators provide high-quality instruction that meets the needs of today's learners.

AWE (Army Writing Enhancement Tool): AWE supports the writing process by facilitating brainstorming and providing high-level critiques after drafting. Piloted at Fort Leavenworth, AWE integrates seamlessly with platforms like Google Docs and encourages critical thinking by treating AI as a peer reviewer, not a ghostwriter. This approach helps learners develop their writing skills and enhances their ability to communicate effectively.

These AI tools developed by AIRCOEE are instrumental in addressing workforce problems by providing personalized, adaptive learning experiences that enhance skill acquisition and critical thinking.

Existing Partnerships with LAUSD and Army University

AIRCOEE has established successful partnerships with the Los Angeles Unified School District (LAUSD), which is the largest school district in the country, and Army University, which is arguably larger than LAUSD depending on how you count it (2M+ learners), to implement its AI tools and enhance education and training programs. These two partnerships represent among the largest learning organizations worldwide.

Partnership with LAUSD: The collaboration between AIRCOEE and LAUSD is formalized through a Memorandum of Understanding (MOU) aimed at bringing cutting-edge AI tools and education to K-12 and adult learners across Southern California. This partnership focuses on the development and rollout of professional development (PD) modules for teachers, equipping them with strategies to use AI tools effectively in the classroom. The District will lead teacher recruitment and provide insights into existing instructional methods and challenges, ensuring that the PD content is practical and relevant. Teachers will pilot the training, allowing the District to gather anonymized data on participation, progress, and content effectiveness. This collaboration aims to enhance AI literacy and skill acquisition among students and teachers, preparing them for the jobs of the 21st century.

Collaboration with Army University: AIRCOEE's partnership with Army University aims to integrate AI tools into military training programs to enhance skill acquisition and operational readiness. The collaboration includes the deployment of AI-driven training tools such as PAL3 and AWE, which have been well-received by military personnel. These tools provide personalized learning experiences and real-time feedback, enabling soldiers to acquire critical skills more efficiently. The success of this partnership demonstrates the potential of AI tools to transform military training and improve the effectiveness of the armed forces.

The success stories and outcomes from these partnerships demonstrate the potential of AI tools to transform education and training programs, making them more effective and engaging.

Scaling Partnerships to Nationwide Education and Training

The potential for scaling the existing partnerships with LAUSD and Army University to a nationwide level is immense. Expanding AI-driven education and training programs across the country can address workforce problems on a larger scale and ensure that students and workers are equipped with the skills needed for the 21st-century job market. Leveraging the expertise and resources of various NSF AI centers can significantly enhance this effort. These include:

NSF AI Institute for Student-AI Teaming (iSAT): iSAT focuses on fostering effective, equitable, and engaging learning experiences for students. iSAT can utilize their technology through the existing LAUSD/ArmyU/AIRCOEE partnership venues and provide a prototype for other nationwide school districts.

NSF AI Institute for Adult Learning and Online Education (AI-ALOE): AI-ALOE aims to enhance the proficiency of adult online education in STEM disciplines. AI-ALOE can utilize their technology through the existing LAUSD/ArmyU/AIRCOEE partnership venues and provide a prototype for other nationwide school districts.

NSF AI Institute for Engaged Learning (EngageAI): EngageAI harnesses the power of AI to revolutionize K-12 STEM education. EngageAI is supposed to create captivating STEM experiences that ignite a passion for science and technology among students, preparing them for future careers in these fields. EngageAI can utilize their technology through the existing LAUSD/ArmyU/AIRCOEE partnership venues and provide a prototype for other nationwide school districts.

NSF AI Institute for Inclusive Intelligent Technologies for Education (INVITE): INVITE focuses on developing AI tools that adapt to the individual needs of diverse learners. Collaborating with INVITE can help the USA create inclusive educational technologies that support all students, including those with special needs.

NSF AI Institute for Foundations of Machine Learning (IFML): IFML is dedicated to developing cutting-edge algorithms and datasets that power generative AI. Partnering with IFML can provide access to advanced AI techniques that enhance the effectiveness of educational tools and training programs.

NSF AI Institute for Intelligent Cyberinfrastructure with Computational Learning in the Environment (ICICLE): ICICLE aims to democratize AI by making its advantages accessible to everyone. Partnering with ICICLE can help us develop AI tools that are easy to use and integrate into various educational settings, promoting widespread AI literacy. ICICLE can utilize their technology through the existing LAUSD/ArmyU/AIRCOEE partnership venues and provide a prototype for other nationwide school districts.

At the risk of being overly redundant, ICT UARC, as a trusted partner to the DoD has a proven track record of developing and deploying advanced AI tools and training systems. Leveraging ICT's expertise and resources can enhance the scalability and effectiveness of AI-driven programs from its own congressional partnership as well as those from the other NSF AI Education Centers focused on AI Education. Collaborating with these centers can provide access to cutting-edge AI technologies and research, as well as deployed technologies to a national classroom environment - further enhancing the quality and impact of AI-driven education and training programs.

Relation to Initial Information Call and Conclusion

The initial information call highlighted the importance of infrastructure support for the AI research and development community, advances in AI applications in cybersecurity and cyberspace operations beyond commercial use, advances in AI for public sector and government applications, and research on AI systems and education supporting American workers and improving workforce productivity. The

initiatives discussed in this essay align with these priorities and demonstrate the potential of AI tools and partnerships to address workforce problems and enhance national security.

Infrastructure Support for AI Research and Development: The collaboration between AIRCOEE, ICT UARC, and NSF AI Education Centers provides a robust infrastructure for AI research and development. By leveraging these resources, we can accelerate the development and deployment of AI tools that address workforce problems and enhance education and training programs.

Advances in AI Applications in Cybersecurity and Cyberspace Operations: AI tools developed by AIRCOEE, such as PAL3 and ARC, can be adapted for use in cybersecurity and cyberspace operations. These tools can provide personalized training and real-time feedback, enhancing the skills and readiness of cybersecurity professionals.

Advances in AI for Public Sector and Government Applications: The AI tools and partnerships discussed in this essay have significant implications for public sector and government applications. By enhancing education and training programs, we can improve the skills and productivity of government employees and ensure that they are prepared to meet the challenges of modern governance.

Research on AI Systems and Education Supporting American Workers: The initiatives discussed in this essay demonstrate the potential of AI systems to support American workers by providing personalized, adaptive learning experiences that enhance skill acquisition and critical thinking. By scaling these initiatives nationwide, we can address workforce problems and improve workforce productivity.

Concluding, addressing workforce problems with AI tools and partnerships is crucial to ensuring future economic competitiveness and national security. By leveraging the expertise and resources of AIRCOEE, ICT UARC, and NSF AI Education Centers, we can enhance education and training programs, making them more effective and engaging. The success of existing partnerships with LAUSD and Army University demonstrates the potential of AI-driven programs to transform education and training. Scaling these initiatives nationwide can provide significant benefits, including enhanced skill acquisition, increased engagement, and improved workforce readiness. By supporting and investing in AI-driven education and training initiatives, stakeholders can help address workforce problems and ensure that the United States remains at the forefront of AI research and development.

A draft press release about AIRCOEE is included; it will be public in final form at the time of the RFI deadline.



AIRCOEE_LAUSD.pdf

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General Comment

Create competency and certification system which proves that certain people can do certain things - leverage existing DoD infrastructure to transfer skills through national standards

Attachments

OSTP RFI 4 Competencies and Certifications

National Upskilling Resources, Certification, and Evidence based Competence as the Digital Currency

by Keith Brawner (AI PhD), and friends

Keith works for the Army but is certainly not representing the Army in this essay and just a helpful citizen

Introduction

In today's rapidly evolving job market, the importance of upskilling and certification cannot be overstated. As technology advances and industries transform, the need for a skilled workforce becomes increasingly critical. Competence, defined as possessing the knowledge and skills that individuals that enable one to perform tasks, is emerging as the new digital currency in this landscape. To ensure that competence is defined, measured, recognized and valued, there is a pressing need for a national-level certification system. This paper explores how leveraging existing investments in SCORM, CaSS, xAPI (Experience API), and xAPI profiles can create a robust framework for identifying models of human capabilities and experience that require competence, collecting data against those models, and using that data to ensure that certifications are relevant and reliable. This is especially relevant for a national workforce upskilling AI skills - which should use AI to monitor and certify the AI skills they are upskilling.

Leveraging Existing Investments in SCORM, xAPI, and xAPI Profiles

SCORM (Sharable Content Object Reference Model) has long been a standard for e-learning, enabling the interoperability of learning content across different systems. However, SCORM's limitations in tracking detailed learning experiences have led to the development of xAPI (Experience API). xAPI allows for the collection of detailed information about how individuals engage with learning materials, participate in training programs, and acquire new skills. xAPI profiles further enhance this capability by providing standardized ways to define and collect data about human performance. It is a DoD-wide DODI-defined standard (DoDI #1322.26).

Several organizations have already adopted xAPI to enhance their training and certification processes. For instance, British Petroleum (BP) uses xAPI to track and certify the skills of its employees, ensuring that they have the required competence for their roles. Further adopters can be seen here (<https://xapi.com/adopters/>). Similarly, Georgia Virtual School District has implemented xAPI profiles to upskill students and prepare them for the workforce and track against their individual degree programs. These examples demonstrate the effectiveness of xAPI in creating a comprehensive and reliable system for collecting human performance data.

Government-Backed Upskilling Technology

While private companies like Google and Oracle offer certification programs, these systems have limitations. Certifications from private entities may not always be recognized universally, and there can be concerns about the credibility and consistency of the certification process, and of course, they are the definition of vendor lock-in. A more lasting issue is knowing whether the individual has been engaging in sustained practice that reflects the use of the credential, which in turn reinforces the validity of that credential. A government-backed certification system can address these issues by

providing a standardized and universally recognized framework for certifying skills. The educational research community calls this a Credential Engine.

Cross-organization cryptographically certification enabled by technologies such as Personal Identity Verification cards, Secure Socket Layer, the Domain Name System, and Single Sign On have demonstrated the validity, integrity and reliability of a potential system. By leveraging these technologies, we can create a federated secure system for holding certification activities. This ensures that certifications are tamper-proof and verifiable, providing a high level of trust and credibility at the national level.

National Certification System

To create a national certification system, we can follow a structured model that includes the following steps:

Model of Competence: Using commercially available tools, define a comprehensive model of competence that outlines what individuals can know and do based on traditional task analysis processes. This model serves as the foundation for the certification system, providing clear and measurable criteria for assessing skills.

Data Collection: Use AI and xAPI to collect data against the competence model. This involves tracking learning experiences, training activities, and performance metrics to gather detailed evidence about individuals' skills and knowledge. AI is used to rapidly triage diverse datastreams using established models of competence and identify when an event demonstrates knowledge, skill, task performance, or another modeled component of competence or a credential.

Data Processing: Analyze the collected data to determine what individuals know and can do. AI algorithms can process this data to identify patterns, assess proficiency levels, and generate insights about individuals' competence.

Credentialing: Issue certifications based on the data analyzed. These certifications are held and managed by their issuing organizations, ensuring that they are secure, verifiable, and universally recognized. The certification process also facilitates job placements and other downstream activities by providing evidence-based proof of competence.

The result of this model is a new currency in the form of evidence-based proof of competence that can be certified by credentialing organizations, ensuring that individuals are recognized and rewarded based on their merit and competence in a digitally traceable way.

Role of DoD Technologies and ICT UARC

The Institute for Creative Technologies (ICT) University Affiliated Research Center (UARC) and Department of Defense (DoD) technologies can play a significant role in advancing these ideas. ICT has made substantial contributions to AI and training technologies, developing tools and systems that enhance learning and skill acquisition. By leveraging ICT's expertise, we can create advanced AI-driven tools for data collection, processing, and credentialing. Specific examples of content update and monitoring systems include the Personalized Assistant for Lifelong Learning (PAL3), AI-Assisted Revisions for Curricula (ARC) and Army Writing Enhancement Tool (AWE). Further technologies can be modified and deployed from the NSF AI-CARING (AI Institute for Collaborative Assistance and Responsive Interaction for Networked Groups), NSF AI-ALOE (AI Institute for Adult Learning and

Online Education), NSF iSAT (AI Institute for Student-AI Teaming), NSF EngageAI (AI Institute for Engaged Learning), and NSF INVITE (AI Institute for Inclusive Intelligent Technologies for Education) Centers for AI in Education, with the addition of important monitoring and certification programs.

Eduworks Corporation, a US DoD contractor specializing in Manpower, Personnel, and Training systems provides tools for capturing task analysis and training needs data into federated models of human capabilities that are then exposed as Open Data for use by other systems. Eduworks is a small business currently serving all branches of the military, broadly engaged in creating digital models of human capabilities, collecting data against those models, and creating dashboards and tools for answering questions using that data and those models.

These DoD technologies, which are designed to support military training and operations (ie. monitoring actual tasks), can also be adapted for civilian use within the educational programs offered in the various centers. This brings additional value to the AI scaling programs and positions the United States as a certification authority for the items it instructs, and desires to instruct. These technologies provide robust and scalable solutions for tracking and certifying skills, ensuring that the certification system is effective and reliable. Integrating the existing DoD technologies into the national certification system can enhance its capabilities and ensure that it meets the highest standards of quality and security.

Addressing the Initial Call

The initial call highlighted the importance of infrastructure support for the AI research and development community, advances in AI applications in cybersecurity and cyberspace operations beyond commercial use, advances in AI for public sector and government applications, and research on AI systems and education supporting American workers and improving workforce productivity. The initiatives discussed in this paper align with these priorities directly and demonstrate the potential of AI tools and partnerships to address workforce problems and enhance national security.

Infrastructure Support for AI Research and Development: The collaboration between the Office of Secretary of Defense (OSD) Advanced Distributed Learning (ADL) Initiative, which holds the xAPI and xAPI profile standards, DoD's ICT UARC, and NSF AI Education Centers provides a robust infrastructure for AI research and development to the learning events which occurred and how they can be certified to have occurred. It is all of the items called for in the call for ideas - R&D, cyber, commercial, American worker support, and productivity enhancing. By leveraging these existing resources, through existing contractual channels, we can accelerate the development and deployment of AI tools that address workforce problems and enhance education and training programs.

Advances in AI Applications in Cybersecurity and Cyberspace Operations: AI tools developed by AIRCOEE, such as PAL3 and ARC, can be adapted for use in cybersecurity and cyberspace operations. These tools can provide personalized training and real-time feedback, enhancing the skills and readiness of cybersecurity professionals.

Advances in AI for Public Sector and Government Applications: The AI tools and partnerships discussed in this paper have significant implications for public sector and government applications. By enhancing education and training programs, we can improve the skills and productivity of government employees and ensure that they are prepared to meet the challenges of modern governance.

Research on AI Systems and Education Supporting American Workers: The initiatives discussed in this paper directly address the potential of AI systems to support American workers by providing personalized, adaptive learning experiences that enhance skill acquisition and critical thinking. By scaling these initiatives nationwide, we can address workforce problems and improve workforce productivity through upskilling between and across various systems.

Conclusion

Addressing workforce problems with AI tools and partnerships is crucial to ensuring future economic competitiveness and national security. By leveraging the expertise and resources of AIRCOEE, ICT UARC, and NSF AI Education Centers, we can enhance education and training programs, making them more effective and engaging. The success of existing partnerships with LAUSD and Army University demonstrates the potential of AI-driven programs to transform education and training.

A key component of this transformation is the use of xAPI and xAPI profiles. These technologies enable detailed tracking of experiences (including learning, practice, and performance) and provide a standardized way to define and measure competence. By integrating xAPI into a national certification system, we can ensure that certifications are secure, verifiable, and universally recognized. This approach provides evidence-based proof of competence, ensuring that individuals are recognized and rewarded based on their merit.

Scaling these initiatives nationwide can provide significant benefits, including enhanced skill acquisition, increased engagement, and improved workforce readiness. By supporting and investing in AI-driven education and training initiatives that leverage xAPI and xAPI profiles, stakeholders can help address workforce problems and ensure that the United States remains at the forefront of AI research and development.

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General Comment

Make Project Lynchpin a Joint Capacity

Attachments

OSTP RFI 5 Army Project Linchpin as a Joint Capability

Advocating for a Joint Capability for Project Linchpin

by Keith Brawner (AI PhD), and friends

Keith works for the Army but is certainly not representing the Army in this essay and just a helpful citizen

Introduction

Project Linchpin represents a groundbreaking initiative by the U.S. Army to establish its first Artificial Intelligence/Machine Learning (AI/ML) Program. Launched to address the critical question of delivering secure, trusted AI to military systems, Project Linchpin has evolved from a conceptual framework in 2023 to an approved program as of 2025 within the Army. The initiative creates a standardized AI/ML operations pipeline specifically designed for secure government environments, with a particular focus on intelligence, cyber, and electronic warfare sensor systems. To further enhance its capabilities, there is a pressing need to create a **joint** capability marketplace where multiple DoD technologies can converge alongside industrial plug-in technologies. This essay advocates for the establishment of such a marketplace, emphasizing the integration of simulations, DEVSECOPS practices, validation testing, and collaboration with academia, industry, and the defense industrial base.

The Vision for a Joint Capability Marketplace

A joint capability marketplace for Project Linchpin would create a centralized platform for integrating diverse technologies from the DoD, industry, and academia. This marketplace would serve as a collaborative ecosystem for AI/ML development and deployment, enabling the DoD to leverage the best of breed technology available across various Industry sectors – and for DoD partners to have a place to test and harden their technologies prior to operationalizing.

By creating a centralized ecosystem, the Army is already streamlining the development process, reducing redundancy, and ensuring that the AI/ML models meet the necessary technical and ethical standards. While this requirement isn't unique to the Army - the other services (Navy, Space Force, etc.) have similar needs for their own tools, methods, and algorithms. Sharing the platform and having cross-service capabilities would also enable continuous monitoring and improvement of AI/ML capabilities from the other services, as well as a selection of "best of breed" for the individual Departments.

The marketplace would bring together government agencies, industry leaders, and academic institutions to collaborate on AI/ML projects. This greater-than-Army collaborative approach would enhance the Army's ability to develop and deploy cutting-edge technologies while maintaining security and operational standards.

Leveraging Technologies and Implementing DEVSECOPS + MLOPS

To maximize the potential of the joint capability marketplace, it is essential to leverage existing DoD technologies and industrial plug-ins while implementing DEVSECOPS and MLOPS practices to ensure secure and efficient AI/ML development.

The existing marketplace is integrating existing Army programs such as the Tactical Intelligence Targeting Access Node (TITAN) and One World Terrain from the USC Institute for Creative Technologies (ICT) UARC. These programs and enabling technologies provide a robust foundation for AI/ML development and can be enhanced through collaboration with industry partners which run within the same environment.

Industrial AI technologies (e.g. Palantir, ScaleAI, Parsons, Striveworks, etc..) have already started to engage with Project Linchpin through their creative multi-layered contracting approach. These partnerships would enable the Army to leverage the latest advancements in AI/ML and ensure that the marketplace remains at the forefront of innovation. This is already done with DEVSECOPS practices within the marketplace for the security/efficiency of AI/ML development, which enables continuous integration and continuous delivery (CI/CD) of AI/ML models. This is already done with DEVSECOPS practices within the marketplace for the security/efficiency of AI/ML development, which enables continuous integration and continuous delivery (CI/CD) of AI/ML models. However, the resources required to manage and secure government data is underwhelming.

Simulations, Validation Testing, and Continuous Improvement

Simulations, validation testing, and continuous improvement are essential components of the joint capability marketplace, ensuring that AI/ML models are rigorously tested and optimized for performance. Army's Linchpin already has a baseline framework for this implementation, which is relevant for operationalizing AI approaches.

Simulations play a critical role in testing and validating AI/ML models before deployment. By creating realistic virtual environments, simulations allow developers to assess the performance of AI/ML models under various conditions and scenarios. This helps identify potential issues and ensures that models are robust and reliable.

Rigorous validation testing is necessary to confirm the accuracy and effectiveness of AI/ML models. This involves measuring model performance, conducting adversarial testing, and ensuring that models meet the required technical and ethical standards. Validation testing provides confidence that AI/ML models will perform as expected in real-world applications.

A joint capability marketplace should incorporate mechanisms for continuous improvement, enabling ongoing optimization of AI/ML models through the update of the simulations from real-world data which in turns updates the training and updates operational performance. This positive feedback loop from deployed models can be used to retrain and refine models, ensuring that they remain effective and up-to-date.

Conclusion

Creating a joint capability marketplace that is properly resourced for Project Linchpin is crucial for integrating multiple DoD technologies and industrial plug-in technologies, fostering collaboration, and ensuring the secure and efficient development of AI/ML capabilities. By leveraging existing investments in technologies incorporating simulations, DEVSECOPS and MLOPS practices, and validation testing, the marketplace can provide a robust framework for certifying skills and competencies across all the departments for rapid prototyping and national defense while collaborating with academia, industry, and the defense industrial base