Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army												Date: March 2023
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602180A *I Artificial Intelligence and Machine Learning Technologies*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.486	16.068	24.142	-	24.142	23.975	22.158	22.520	22.273	0.000	145.622
CL2: *AI Enhanced Intel Operations Technologies*	-	3.589	2.076	2.546	-	2.546	2.963	3.069	3.373	3.328	0.000	20.944
CL7: *ATR Using Multiple Cooperative Sensors App Tech*	-	7.366	6.388	10.895	-	10.895	11.401	9.356	9.368	9.488	0.000	64.262
CN7: *Predictive Maintenance Applied Research*	-	3.531	4.694	6.030	-	6.030	6.093	6.201	6.225	6.398	0.000	39.172
DA5: *AI Enabled Talent Management Applied Research*	-	-	0.319	-	-	-	-	-	-	-	0.000	0.319
DA6: *AI-Enabled Command and Coordination Apl Research*	-	-	2.591	3.265	-	3.265	3.518	3.532	3.554	3.059	0.000	19.519
DE8: *AI Development Environment Applied Research*	-	-	-	1.406	-	1.406	-	-	-	-	0.000	1.406

Note

In Fiscal Year 2024 (FY24), Project DE8 (AI Development Environment Applied Research) is a New Start.

A. Mission Description and Budget Item Justification

This Program Element (PE) investigates artificial intelligence (AI) and machine learning (ML) to support an AI-enabled Multi-Domain Operations (MDO) Force to mature target recognition/detection using multiple cooperative autonomous sensors (MCAS), leader decision-making, replication of tactical behaviors to enable autonomous capabilities for maneuver, predictive maintenance, and intelligence support for operations in support of long-range precision fires. The Army's Artificial Integration Center (AI2C) will provide strategic guidance and coordination of these applied research efforts in AI/ML across the Army Modernization enterprise.

Work in this PE contributes to the Army Science and Technology (S&T) portfolio and is fully coordinated with efforts in PE 0601601A (Artificial Intelligence Basic Research) and PE 0603040A (Artificial Intelligence Advanced Technologies).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering S&T focus areas, the Army Modernization Strategy and the Chief Digital and Artificial Intelligence Office (CDAO).

Research in this PE is performed by the United States Army Futures Command (AFC).

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602180A *I Artificial Intelligence and Machine Learning Technologies*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	15.034	16.454	17.906	-	17.906
Current President's Budget	14.486	16.068	24.142	-	24.142
Total Adjustments	-0.548	-0.386	6.236	-	6.236
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.548	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	6.236	-	6.236
• FFRDC Transfer	-	-0.386	-	-	-

Change Summary Explanation

Increased funding to support higher priorities in the Science & Technology (S&T) portfolio to include the initiation of new efforts related to artificial intelligence.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*				Project (Number/Name) CL2 / *AI Enhanced Intel Operations Technologies*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
CL2: *AI Enhanced Intel Operations Technologies*	-	3.589	2.076	2.546	-	2.546	2.963	3.069	3.373	3.328	0.000	20.944

A. Mission Description and Budget Item Justification

This Project will design and develop various technologies to augment human intelligence analysts with artificial intelligence (AI) and machine learning (ML)-enabled decision support, workflow automation, and recommendation tools to modernize how the Intelligence Warfighting Function supports Multi-Domain Operations and Joint All Domain Command and Control (JADC2). This Project will mature technologies that will enable interoperable intelligence organizations capable of conducting synchronized, proactive intelligence operations to optimize individual efficiencies and team performance.

The Capstone Concept for Joint Operations: Joint Force 2020 and the Force 2025 and Beyond (F2025B) strategy calls for the integration of terrestrial sensing and exploitation capabilities to accelerate the data to decision cycle across the Range of Military Operations (ROMO). The Army Operating Concept and the Army Functional Concepts identifies the need for interoperable intelligence organizations capable of conducting synchronized proactive intelligence operations that optimize individual efficiencies and team performance. These concepts are driven by a threat that has studied United States (US) advancements during the Global War on Terror and taken notes.

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

This research is supported and coordinated with the Army Intel Community, Army Futures Command, and the Army Intelligence, Surveillance, Reconnaissance (ISR) Task Force.

Work in this Project supports the Army Science and Technology Ground Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO)

Work in this Project is performed by the US Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Synthetics and Low Level Detection ***Description:*** This effort will design and develop AI and ML technologies for low level object generation, detection and recognition that address the significant variation in object imagery and limited amounts of available training data for AI / ML algorithms.	0.936	-	-
Title: AI Enhancements for Prometheus ***Description:*** AI Enabled Intelligence Fusion for Targeting will address a "multi-INT" fusion problem and demonstrate how AI algorithms can fuse data from various military intelligence systems to support sensor to shooter automation for the strategic,	1.153	0.500	-

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
operational, and tactical levels. This effort will design and develop AI capabilities for support of Long Range Precision Fires, Mission Command, and Maneuver Commanders by leveraging Intelligence Community enterprise investments in sensing, data transport, and Machine Learning / AI frameworks. ***FY 2023 Plans:*** Prometheus is a system that utilizes AI technologies to identify targets of interest from overhead satellite images. This effort will mature algorithms developed under the umbrella of Prometheus to predict representation for novel object classes from a small number of novel class samples, improving the AI algorithm learning capability and reducing the need for manual data input. Will investigate the use of visual information and semantic relationships to learn new objects and validate knowledge transfer from base classes to novel classes in order to reduce the time it takes to train AI algorithms. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decrease due to planned completion of effort in Fiscal Year (FY) 2023.			
Title: AI-Enabled Intelligence Decision Support ***Description:*** This effort will investigate the augmentation of Military Intelligence and Operations (Intel/Ops) with artificial intelligence capabilities to leverage Mission, Enemy, Terrain and Weather, Troops, Time Available, and Civilian Considerations (METT-TC) information available to Commanders in support of Intelligence Preparation of the Battlefield (IPB) and the Military Decision Making Process (MDMP). The effort will mature techniques to visualize and animate threat models to support automated AI-enabled enemy courses of action analysis. ***FY 2023 Plans:*** Design and develop AI agents to employ METT-TC information available to Commanders to generate courses of action for threat formations as well as conduct AI-war gaming in support of Intelligence Preparation of the Battlefield and the Military Decision Making Process. This effort will conduct experiments of automated real-time strategy war gaming between synthetic agents representing friendly and adversary forces at the Division echelon. ***FY 2024 Plans:*** Design and develop AI agents to employ METT-TC information available to Commanders to generate courses of action for threat formations as well as conduct AI-war gaming in support of Intelligence Preparation of the Battlefield and the Military Decision Making Process. This effort will conduct experiments of automated real-time strategy war gaming between synthetic agents representing friendly and adversary forces at the Division echelon.	1.100	1.000	1.000
Title: Foundation for AI Intelligence Support to Operations (ARCANE SERIES)	0.400	0.500	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Description: Design and develop an AI infrastructure/pipeline for training, integrating, and sustaining AI across multiple AI domains to inform requirements for enterprise production systems and edge systems for the Army Military Intelligence and Operations (Intel/Ops) community. ***FY 2023 Plans:*** Will investigate data frameworks for algorithmic fusion of information from multiple intelligence collection systems and multi-modal machine learning and scenery construction to compare and apply lessons learned. ***FY 2024 Plans:*** Will mature data frameworks and data pipelines for fusion of intelligence data from multiple military intelligence systems. Will develop and conduct experiments with infrastructure components that can implement machine learning algorithms across multiple AI domains.			
Title: SBIR/STTR Transfer ***FY 2023 Plans:*** Funding transferred in accordance with Title 15 USC §638 ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC §638	-	0.076	-
Title: Rare Object Generation and Detection ***Description:*** This effort will design and develop AI and machine learning (ML) technology to generate and detect objects that are rarely detected and have limited training data sets (rare object generation and detection). Rare object generation and detection is a key ML challenge due to limited amounts of available training data that make it difficult to build high performing AI models to address these challenges. ***FY 2024 Plans:*** This effort will design and develop AI and machine learning (ML) algorithms for rare object generation, detection and recognition. Research will investigate technical approaches to address object image variations and limited amounts of available training data such as the use of synthetic data. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increase to expand efforts to develop AI/ML technologies for rare object generation, detection and recognition.	-	-	0.511
Title: AI-Enabled Intelligence Fusion for Targeting	-	-	0.535

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Description: AI Enabled Intelligence Fusion for Targeting will investigate the fusion of different type of intelligence data (multi-INT fusion) and validate AI algorithms that can fuse data from various military intelligence systems to support sensor to shooter automation for the strategic, operational, and tactical levels. This effort will design and develop AI capabilities for support of Long Range Precision Fires, Mission Command, and Maneuver Commanders by leveraging Intelligence Community enterprise investments in sensing, data transport, and Machine Learning / AI frameworks. ***FY 2024 Plans:*** Will develop a system of applications that utilize AI technologies to identify targets of interest and develop algorithms that use multiple data sources to predict representation for novel object classes from a small number of novel class samples. Will investigate the fusion of visual, language, signal, and event-based information and semantic relationships to learn new objects and relationships and validate knowledge transfer from base classes to novel classes in order to reduce the time it takes to train AI algorithms. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increase to expand efforts to develop AI technologies from multiple AI domains to identify targets of interest.			
Accomplishments/Planned Programs Subtotals	3.589	2.076	2.546

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) CL7 / *ATR Using Multiple Cooperative Sensors App Tech*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CL7: *ATR Using Multiple Cooperative Sensors App Tech*	-	7.366	6.388	10.895	-	10.895	11.401	9.356	9.368	9.488	0.000	64.262

A. Mission Description and Budget Item Justification

This Project will design and develop Artificial Intelligence (AI) and Machine Learning (ML) algorithms that leverage a team of air and ground sensors to autonomously navigate and collaborate through shared perception of the optical, thermal, and electromagnetic spectrums to find, identify, geo-locate, and track targets during reconnaissance missions.

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project supports the Army Science and Technology Lethality Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO).

Research in this Project is performed by the United States (US) Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Collaborative Target Detection and Tracking	5.416	4.370	4.695
Description: This effort will design and develop the AI / ML technologies to automatically detect and track targets using electro-optical, thermal, and electromagnetic sensors and constrained computing hardware onboard the air and ground vehicles and share threat perception across the unmanned team.			
FY 2023 Plans: Design and develop a cloud-native data pipeline that allows for AI model fine-tuning at the edge in a Denied-Degraded-Intermittent-Limited (DDIL) communications environment. Investigate radio frequency (RF) signature fingerprinting and classification, cross-queueing between platforms for different vantage point, and probability aggregation to improve classification confidence. Design and develop algorithms that enable platforms to collaborate on target searches and fuse target information to avoid erroneous tracks.			
FY 2024 Plans: Will develop algorithms that enable autonomous air and ground vehicles to track and maintain custody of targets after detection to aid in the subsequent stages of the targeting cycle including engagement and assessment. Develop algorithms that share the attributes of targets detected by a single platform to the entire team of autonomous sensors.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL7 / *ATR Using Multiple Cooperative Sensors App Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Funding change reflects planned life cycle of effort.			
Title: Autonomous and Collaborative Mobility ***Description:*** This effort will design and develop mobility algorithms using AI and ML techniques that allow autonomous ground and air vehicles to passively perceive the terrain and self-navigate without active and detectable sensing. Design and develop collaborative teaming techniques for autonomous air and ground vehicles to work together on reconnaissance missions. ***FY 2023 Plans:*** Design and develop AI algorithms that enable autonomous and collaborative maneuver of air and ground platforms at night or Global Positioning System (GPS) -denied environments. ***FY 2024 Plans:*** Design and develop AI algorithms that enable autonomous air and ground platforms to maneuver more tactically and collaboratively during reconnaissance missions. Develop a simulation environment that will allow for reinforcement learning to be leveraged in the development of tactical and collaborative behaviors for the air and ground platforms based on terrain, anticipated enemy locations, view shed, and other factors. Develop autonomy algorithms for more complex terrain and conditions, including nighttime and Global Positioning System (GPS)-denied environments. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Increased funding for additional efforts to support simulation environments to allow for reinforcement learning and developing autonomy algorithms for more complex terrain and conditions.	1.000	1.000	4.700
Title: Intuitive Mission Command Interfaces ***Description:*** Design and develop the capability for warfighters to quickly and intuitively convey reconnaissance guidance, confirm or deny detected targets, and take recommended action through common mission command tools, including Tactical Assault Kit (TAK) and Integrated Visual Augmentation System (IVAS). ***FY 2023 Plans:*** Investigate AI algorithms that recommend courses of action for mission activities of the autonomous sensors. ***FY 2024 Plans:*** Develop software for the Integrated Visual Augmentation System (IVAS) that enables soldiers to intuitively relay reconnaissance intent to a team of autonomous sensors and quickly interpret feedback from the systems and make targeting decisions. Explore various algorithms that use voice commands, eye movements, and hand gestures to interact with the system for relaying intent	0.950	0.470	1.500

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL7 / *ATR Using Multiple Cooperative Sensors App Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
and closing the targeting cycle more effectively. Develop feedback mechanisms in Android Tactical Assault Kit (ATAK) and IVAS to improve the AI algorithms once soldiers recognize mistakes by the autonomous sensors. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding change reflects planned life cycle of effort.			
Title: Coeus ***Description:*** This effort investigates cloud and cloud-native architectures, orchestration technologies, and collaboration techniques to support current and future AI model development and machine learning operations (MLOps) tasks across a globally distributed workforce. Research will increase efficiency of development platforms, decrease model development costs, and reduce the time required to integrate new AI capabilities into software products. ***FY 2023 Plans:*** Will conduct data science and engineering in support of ATR-MCAS (Aided Target Recognition - Mobile Cooperative and Autonomous Sensors) through the use of Coeus, a modular software platform (cloud native). ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding change reflects planned life cycle of effort.	-	0.315	-
Title: SBIR/STTR Transfer ***FY 2023 Plans:*** Funding transferred in accordance with Title 15 USC §638 ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC §638	-	0.233	-
Accomplishments/Planned Programs Subtotals	7.366	6.388	10.895

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) CN7 / *Predictive Maintenance Applied Research*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CN7: *Predictive Maintenance Applied Research*	-	3.531	4.694	6.030	-	6.030	6.093	6.201	6.225	6.398	0.000	39.172

A. Mission Description and Budget Item Justification

This Project designs and develops artificial intelligence (AI) and machine learning (ML) tools and capabilities to predict and analyze maintenance status for emerging and legacy aviation and ground platforms. Investigates techniques to extract data from maintenance databases and platform sensors and make inferences of missing data via virtual simulations. Will investigate maintenance concepts that employ AI data capture and integrate AI tools into enterprise resource planning for military aviation and ground vehicles. Will determine platforms of focus and prioritize by cost and value to Army missions. Each platform will be sequentially investigated at the appropriate component (i.e. engine health) and fleet level. Will determine appropriate technologies and capabilities needed to construct a robust Army-wide predicative maintenance platform that will accelerate the pace of innovation for this problem set. Will validate and inform requirements and technical architectures for modernization efforts of next generation aviation and ground systems both manned and unmanned.

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project supports the Army Science and Technology Ground Portfolio and the Joint Artificial Intelligence Center (JAIC).

Research in this Project is performed by the United States (US) Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Predictive Maintenance	3.531	4.523	6.030
Description: This Project designs and develops artificial intelligence (AI) and machine learning (ML) tools and capabilities to predict and analyze maintenance status for emerging and legacy aviation and ground platforms. Investigates techniques to extract data from maintenance databases and platform sensors and make inferences of missing data via virtual simulations. Will investigate maintenance concepts that employ AI data capture and integrate AI tools into enterprise resource planning for military aviation and ground vehicles. Will determine platforms of focus and prioritize by cost and value to Army missions. Each platform will be sequentially investigated at the appropriate component (i.e. engine health) and fleet level. Will determine appropriate technologies and capabilities needed to construct a robust Army-wide predicative maintenance platform that will accelerate the pace of innovation for this problem set. Will validate and inform requirements and technical architectures for modernization efforts of next generation aviation and ground systems both manned and unmanned. The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CN7 / *Predictive Maintenance Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Research in this Project supports the Army Science and Technology Ground Portfolio and the Joint Artificial Intelligence Center (JAIC). Research in this Project is performed by the United States (US) Army Futures Command. ***FY 2023 Plans:*** Will investigate data collection/aggregation techniques and data architectures, and design and develop data pipelines to a cloud-based environment. Will design and develop a scalable, cloud-based data management environment that serves as a data lake repository for incoming data pipelines from the physical data management platforms established at the point of the maintenance activity. Design and develop techniques to aggregate data at the point of the maintenance activity and establish a single pipeline to transition the aggregated data to a scalable, cloud-based data management environment. Design and develop a scalable cloud-based data management architecture accessible via Coeus on an Army-based and owned system. ***FY 2024 Plans:*** Will validate AI models addressing high-priority maintenance and supply concerns relevant to tactically-orientated formations. Will explore the pairing these AI models with the foundational components of a scalable hybrid edge/cloud data management environment able to maneuver with Army units in Multi-Domain Operations. Investigations will validate the appropriate balance of edge/cloud data storage, curation, movement, and automation. These features will be determined in reference to operations when the connection to the Department of Defense Information Network (DODIN) is disrupted and when it is connected. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding change reflects planned life cycle of this effort.			
Title: SBIR/STTR Transfer ***FY 2023 Plans:*** Funding transferred in accordance with Title 15 USC §638. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC §638.	-	0.171	-
Accomplishments/Planned Programs Subtotals	3.531	4.694	6.030

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CN7 / *Predictive Maintenance Applied Research*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) DA5 / *AI Enabled Talent Management Applied Research*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DA5: *AI Enabled Talent Management Applied Research*	-	-	0.319	-	-	-	-	-	-	-	0.000	0.319

A. Mission Description and Budget Item Justification

This Project designs, develops, and validates applied behavioral and social science research to enhance the Soldier Lifecycle (e.g., selection, assignment, training, and leader development) and human relations (e.g., unit cohesion). This Project will design and develop new personnel measures and methods that more fully assess potential and predict performance, behavior, attitudes, and resilience. These technologies also provide innovative and effective Force Integration methods to optimize individual and team performance to ensure the Army can meet mission requirements in uncertain and complex environments. This Project designs and develops new performance measures and metrics for individuals and units, designs innovative training methods, and conducts scientific assessments to inform Human Capital policy and programs. This Project will also investigate non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project supports the Army Science and Technology Ground Portfolio and the Joint Artificial Intelligence Center (JAIC).

Research in this Project is performed by the United States (US) Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Artificial Intelligence (AI)-Enabled Skill Identification for Job Matching and Team Building	-	0.307	-
Description: This effort will develop AI techniques to create an analytical suite that can measure skills required by job postings and skills possessed by soldiers and officers. This will permit the Army to "put the right person in the right job" and determine how to combine individuals to optimize team performance. ***FY 2023 Plans:*** Will investigate the difference between the skill pairings of successful vs. unsuccessful teams using natural language processing. This effort will determine how teams can become 'more than the sum of their parts' and use neural networks to predict successful team outcomes from these individuals' skill sets. This project will design and develop algorithms to identify complementary team members and recommend individual substitutions to improve team performance. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Work on this project will finish in FY 2023.			
Title: SBIR/STTR	-	0.012	-

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA5 / *AI Enabled Talent Management Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638 ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC §638			
Accomplishments/Planned Programs Subtotals	-	0.319	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) DA6 / *AI-Enabled Command and Coordination Apl Research*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DA6: *AI-Enabled Command and Coordination Apl Research*	-	-	2.591	3.265	-	3.265	3.518	3.532	3.554	3.059	0.000	19.519

A. Mission Description and Budget Item Justification

This Project designs and develops solutions that enable Artificial Intelligence (AI)-Enabled Command and Coordination. Additionally, project investigates and matures technologies required to enable commanders and their staff to synchronize and converge all elements of available combat power to achieve multi-domain effects. Technology maturation includes the development and testing of algorithms, models, software, hardware, and interfaces required to support the command of Army forces, coordination of Army operations, execution of the operations process, and establishing necessary C2 systems.

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project is performed by the United States (US) Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Course of Action (COA) Analysis for Optimal Operations	-	1.500	-
Description: Design and develop a game theory based algorithm to create optimal or near-optimal COA for red and blue forces based on available data or user inputs.			
FY 2023 Plans: Will design and develop a game theory algorithm and integrate with an available simulation framework to create COAs at various echelons. Will investigate and determine scenario criteria need for the algorithm to function, design and develop learning strategies and utility functions, and integrate the AI system into an available simulation suite to enable model training. Design and develop a cloud-native data pipeline that allows for distributed decision making at the tactical edge in a Denied-Degraded-Intermittent-Limited (DDIL) environment.			
FY 2023 to FY 2024 Increase/Decrease Statement: Planned effort will be completed in FY 2023.			
Title: AI-Enhanced Battle Damage Assessment	-	0.996	-
Description: Design and develop algorithms to optimize the relationships between known friendly force sensors and shooters and assign them to available targets.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA6 / *AI-Enabled Command and Coordination Apl Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Will design and develop a game theory-based algorithm for a platoon level engagement to provide optimizations between known blue sensors and shooters and the assignment to available targets. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Planned effort will be completed in FY 2023.			
Title: AI-Enhanced Planning for Optimal Operations ***Description:*** Designs and develops AI-enabled systems that link people, processes, networks, and command posts in support of command and control. Develops and trains models that analyze, understand, and optimize AI-operations across Army Battle Command Systems and data fabrics. Develops platforms to access AI-enabled C2 tools from austere environments. Establishes pipelines that assess, train, retrain, store, and disseminate AI models and tools. Establishes access to fused multitudinous data sources in support of AI-based analytics capabilities. ***FY 2024 Plans:*** Will design and develop game theory and multi-agent reinforcement learning algorithms and integrate with an available simulation framework to create COAs at various echelons. Will investigate and determine scenario criteria need for the algorithm to function, design and develop learning strategies and utility functions, and integrate the AI system into an available simulation suite to enable model training. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Increase in funding to support planned initiation of this effort.	-	-	2.000
Title: AI Command and Coordination Environment ***Description:*** Designs and develops AI-enabled systems that link people, processes, networks, and command posts in support of command and coordination. Develops and trains models that analyze, understand, and optimize AI-operations across Army Battle Command Systems and data fabrics. Develops platforms to access AI-enabled C2 tools from austere environments. Establishes pipelines that assess, train, retrain, store, and disseminate AI models and tools. Establishes access to fused multitudinous data sources in support of AI-based analytics capabilities. ***FY 2024 Plans:*** Design and demonstrate a cloud native C2 environment for access to AI-tools at the edge in degraded communications environments. Incorporate tactical data fabric concepts with AI enabled decision dominance hardware and software requirements. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Increase in funding to support planned initiation of this effort.	-	-	1.265
Title: SBIR/STTR	-	0.095	-

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA6 / *AI-Enabled Command and Coordination Apl Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638 ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC §638			
Accomplishments/Planned Programs Subtotals	-	2.591	3.265

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) DE8 / *AI Development Environment Applied Research*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DE8: *AI Development Environment Applied Research*	-	-	-	1.406	-	1.406	-	-	-	-	0.000	1.406

Note

AI Development Environment Applied Research is a new start within the Artificial Intelligence and Machine Learning Technologies program in FY 2024.

A. Mission Description and Budget Item Justification

The Army lacks a common platform to develop AI/ML. This results in siloed and duplicative work that is inefficient. Many current solutions have narrow application and are proprietary, requiring additional funding, time, and labor for even minor modifications. The AI-enabled Army of the future will require low cost, rapid AI/ML solutions at the edge. This project will design and develop a set of platform(s), and infrastructure optimized for Army use and ready for rapid employment in enterprise, multi, and hybrid cloud environments to support?modular software (cloud native) intended to continuously develop and integrate AI/ML models. It will design and develop hardware and software technologies, including cloud native applications and infrastructure for globally dispersed AI/ML development collaboration, artifact sharing, automated resource provisioning, and continuous ML Operations. The AI Development Environment will provide the AI-enabled Army of the future with low cost, rapid AI/ML solutions at the edge and accelerated algorithm development for faster delivery to the field.as well as less expensive AI/ML development by leveraging shared resources.?

The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project supports the Army Science and Technology Network Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO).

Work in this Project is performed by the US Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Artificial Intelligence Environment Applied Research	-	-	1.406
Description: This effort investigates cloud and cloud-native architectures, orchestration technologies, and collaboration techniques to support current and future AI model development and machine learning operations (MLOps) tasks across a globally distributed workforce. Research will increase efficiency of development platforms, decrease model development costs, and reduce the time required to integrate new AI capabilities into software products.			
FY 2024 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DE8 / *AI Development Environment Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Will investigate hybrid cloud architectures to support MLOps from the cloud to the tactical edge. Design and develop techniques to optimize cloud operations in a hybrid or multi-cloud environments. Will investigate the integration of additional software tools with the development environment to increase options of Artificial intelligence (AI) algorithm development and testing. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** This project is a FY24 New Start.			
Accomplishments/Planned Programs Subtotals	-	-	1.406

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A