

Opportunity Title: USAISR Artificial Intelligence/Machine Learning Postdoctoral Fellowship

Opportunity Reference Code: USAISR-2026-0012

Organization U.S. Department of Defense (DOD)

Reference Code USAISR-2026-0012

How to Apply Click on *Apply* at the bottom of the opportunity to start your application.

Description

The Department of Defense (DoD) is offering a post-doctoral fellowship at the U.S. Army Medical Research and Development Command - Institute of Surgical Research (USAMRDC ISR) within the Expeditionary Medical Systems (EMS) Department

What will I be doing and why should I apply? As the selected candidate, you will engage with data scientists, and systems engineers in research projects with emphasis on various advanced modeling techniques. You will have the opportunity to participate in various projects utilizing artificial intelligence (AI) and machine learning (ML) to develop applications that optimize combat casualty care. Research learning activities may include:

- Designing and implementing Discrete Event Simulation (DES) models to simulate complex system workflows, queuing networks, logistics, and operational state changes within the digital twin environment
- Developing deep learning architectures for time-series forecasting, anomaly detection, and predictive maintenance of the physical asset
- Designing and training Physics-Informed Neural Networks (PINNs) and hybrid models that respect the physical laws governing the real-world system
- Applying Deep Reinforcement Learning (DRL) algorithms to optimize processes within simulation environments
- Utilizing Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and diffusion models to augment sparse datasets and simulate edge-case operational and clinical scenarios
- Implementing Bayesian networks and uncertainty quantification techniques to account for sensor noise and model confidence limits
- Designing, training, and fine-tuning computer vision models to extract clinically relevant information from medical imagery, video feeds, and operational sensor streams.
- Building and integrating multi-modal models that fuse vision, text, audio, physiological signals, and structured telemetry to support holistic situational awareness and decision support in combat casualty care
- Adapting large vision-language models (VLMs) and multi-modal foundation models, including prompt engineering, fine-tuning, and retrieval-augmented approaches, to enable natural language interaction with visual and clinical data
- Developing scalable annotation, preprocessing, and augmentation pipelines for image and video datasets, including handling of imbalanced, noisy, and low-resource medical data
- Creating evaluation protocols for vision and multi-modal models, including bias assessment, robustness testing, explainability, and clinically meaningful performance metrics
- Optimizing computer vision and multi-modal models for efficient, low-latency inference on resource-constrained or edge devices relevant to point-of-injury and field telemedicine environments
- Building automated pipelines to ingest multidimensional and multi-modal data to feed the digital models
- Implementing continuous, bi-directional data flow required to keep the digital twin



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synchronized with the physical state in near real-time

- Connecting predictive ML models, computer vision systems, and simulations with visualization platforms to provide actionable insights to human operators
- Implementing frameworks for continuous model monitoring, retraining, versioning, and deployment to ensure the digital twin and associated AI models adapt to degradation or changes in the physical system over time

Where will I be located? Fort Detrick, Maryland

What is the anticipated start date? The USAISR is ready to make appointments immediately. Exact start dates will be determined at the time of selection and in coordination with the selected candidate. Applications are reviewed on an ongoing basis and internships or fellowships will be filled as qualified candidates are identified.

What is the appointment length? Appointments are initially for one year with the option to extend the appointment for up to four additional years, contingent upon project needs and funding availability.

What are the provisions? You will receive a stipend to be determined by USAISR. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other provisions may include the following:

- Health Insurance Supplement (*Participants are eligible to purchase health insurance through ORISE*)
- Relocation Allowance
- Training and Travel Allowance

About USAISR: The U.S. Army Institute of Surgical Research (USAISR) is one of six research laboratories within the U.S. Army Medical Research and Development Command of the U.S. Army Medicine Command (USAMRDC). The Institute is the Army's lead research laboratory for improving the care of combat casualties. The mission of the Institute is to "Optimize Combat Casualty Care". For more information about the USAISR, please visit <https://usaisr.health.mil/>

About ORISE: This program, administered by Oak Ridge Associated Universities (ORAU) through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and DoD. Participants do not enter an employee/employer relationship with ORISE, ORAU, DoD or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the [ORISE Research Participation Program at the U.S. Department of Defense](#).

Qualifications The qualified candidate will hold a PhD in a STEM field listed in the opportunity's eligibility section. Degree must have been received within five years of the appointment start date.

Security Clearance

While participants will not enter an employment relationship with DoD or any other agency, this opportunity will require a suitability investigation/background investigation. Any offer made is considered tentative pending favorable outcome of the investigation.

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Preferred Skills:

- Discrete Event Simulation for workflows/logistics
- Deep learning for time-series forecasting & anomaly detection
- Computer vision (detection, segmentation, classification, pose) using Vision Transformers & CNNs
- Multi-modal models fusing imagery, video, text, audio & physiological data
- VLMs, multi-modal foundation models, fine-tuning & prompt engineering
- Physics-Informed Neural Networks & hybrid models
- Deep Reinforcement Learning for process optimization
- GANs, VAEs, diffusion models for synthetic data & simulation
- Bayesian networks & uncertainty quantification
- ML frameworks (PyTorch, TensorFlow, Hugging Face, OpenCV) & Python
- Automated pipelines for multi-modal data
- Continuous, bi-directional data flow for real-time sync
- Edge/real-time inference optimization (quantization, pruning, ONNX/TensorRT)
- Visualization platforms (e.g., NVIDIA Omniverse)
- MLOps (monitoring, retraining, deployment)
- Model evaluation, explainability & responsible AI

Application Requirements

A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - Please upload a copy of a transcript for your current or most recent degree program that meets the disciplinary qualifications of the opportunity. [Click here for detailed information about acceptable transcripts.](#)
- One Recommendation. We encourage you to contact your recommenders as soon as you start your application to ensure they are able to complete the recommendation form and to let them know to expect a message from Zintellect. Recommenders will be asked to rate your scientific capabilities, personal characteristics, and describe how they know you. You can always log back in to your Zintellect account and check the status of your application.

If you have questions, send an email to ARMY-MRMC@orise.orau.gov. Please list the reference code of this opportunity [<>] in the subject line of the email. Please understand that ORISE does not review applications or select applicants; selections are made by the sponsoring agency identified on this opportunity. All application materials should be submitted via the "Apply" button at the bottom of this opportunity listing. Please do not send application materials to the email address above.

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Point of Contact [Kimberly](#)

Eligibility • **Citizenship:** LPR or U.S. Citizen

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- Requirements**
- **Degree:** Doctoral Degree received within the last 60 month(s).
 - **Discipline(s):**
 - **Computer, Information, and Data Sciences** ([5](#) 👁)
 - **Engineering** ([2](#) 👁)
 - **Life Health and Medical Sciences** ([2](#) 👁)