

Table 1 Research Themes for the NEST Fellows 2026

Feb.9,2026

No.	Organisation	Research Theme			Number of NEST Fellows	Term	Radiation Worker/ Non-Radiation Worker	Field
		Title	Summary					
1-1	Japan Atomic Energy Agency (JAEA) Japan	Robotics & Remote System	Remote Radiation Sensing and Robotics for Fukushima Decommissioning	This project invites a motivated NEST Fellow to explore the intersection of robotics and radiation measurement technologies in the context of nuclear decommissioning. The focus will be on developing and testing field-oriented ideas that support remote radiation sensing and data collection in high-radiation, hard-to-access environments such as the Fukushima Daiichi Nuclear Power Station. Specific activities will be adjusted based on the Fellow's interests and background, with opportunities to engage in system concept development, sensor integration, basic field experiments, or data analysis. The fellow can conduct tests at the facilities of JAEA's Naraha center for Remote Control technology development.	1 person	1-3 months (Sep.-Nov.,2026)	Non-Radiation Worker	Radiation measurements & robotics
2-1	The University of Tokyo Japan	Robotics & Remote System	Innovative sensing technologies for disaster response robots under severe environments	In decommissioning of Fukushima-daiichi nuclear power station, it is essential for the disaster response robots to know their surrounding environments. In this theme, the participant will work on development of new sensing techniques for robots using camera, RGB-D sensor, LiDAR, or radiation detector. Research topics will be flexible to some extent.	Max. 2 people	1-4 months (Sep.-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information
2-2		Robotics & Remote System	Development on multiple robot platform for task planning and teleoperation	Radioactive contamination does not allow humans to access contaminated environments to conduct inspections and measurements in the case of nuclear disasters. Considering these situations, mobile robots are expected to replace humans to carry out safety inspections. Our research group has planned to use multiple robots equipped with laser range finders etc. The participant will work on development of robot platform for radiation mapping and teleoperation, especially, coordination and planning for multiple robots operation. Research topics will be flexible to some extent.	Max. 3 people	1-4 months (Sep.-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information
2-3		Robotics & Remote System	Development of haptic teleoperation system	Teleoperation is essential for decommissioning tasks, where haptic feedback plays a critical role in enhancing operability. This research project aims to develop an advanced haptic teleoperation system utilizing pseudo-force and/or tactile feedback. Participants will contribute to the development of key system components, including haptic stimulators, tactile displays and sensors, and GUIs. Specific research topics can be tailored to the participant's interests and expertise.	Max. 2 people	1-4 months (Sep.-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information
2-4		Robotics & Remote System	Modular robot systems for decommissioning task	Our research group is conducting research of distributed/integrated robot systems based on the concept of environmental structuring. Robots are anticipated to play an active role in severe environments where it is difficult for humans to enter, such as the decommissioning of the Fukushima Daiichi Nuclear Power Station. However, for robots to demonstrate their true value, it is important to structure an environment where they can work actively. We propose an idea that robots themselves become the operating environment for other robots. To realize this idea we are conducting research and development of modular robot systems; Modularize rail structures, Rail DRAGON, and Rail Spider. In this program, we expect program participants to conduct research on some extracted elements of these modular robot systems. Research topics will be flexible to some extent.	Max. 2 people	1-4 months (Sep.-Dec.,2026)	Non-Radiation Worker	Robotics, Mechanical Design, Human Machine Interaction

3-1	Oregon State University United States	Robotics & Remote System	Develop Multi-purpose Payloads for UGVs and UAVs	OSU's current fleet of robots includes a Boston Dynamics Spot robot, a Aurelia X6 drone, and a customized wheeled robot. The participant will contribute to the development of multi-purpose payloads for these robotic platforms for applications such as radiation sensing and mapping, remote monitoring, and plant digitization.	1 person	up to 3 months (Sep.-Dec.,2026)	Radiation Worker	Master or PhD degree, interest in robot mechanics, electronics, radiation detection, and programming
3-2		Remote Spectroscopic Analysis	Spectroscopic Measurements for Remote Monitoring	LIBS can be used to analyze any material regardless of its physical state. It can identify any elements present in the sample in principle. LIBS has also been recommended by the International Atomic Energy Agency (IAEA) for process monitoring. Another laser spectroscopy technique, namely tunable diode laser absorption spectroscopy (TDLAS), deserves more investigation because of its low detection limits and high specificity. In this project, the participant will develop and demonstrate in-situ elemental and isotopic analysis via laser spectroscopy on remote samples.	1 person	up to 3 months (Sep.-Dec.,2026)	Non-Radiation Worker	Master degree, interest in laser spectroscopy, remote sensing, nuclear engineering, physics.
3-3		Advanced Radiation Measurement	Sensor Fusion for Enhanced Radiation Detection and Measurement	The participant will develop high-performance sensor fusion using advanced algorithms. Data from contextual sensors, such as video cameras, LIDAR, and meteorological sensors, will be analyzed alongside radiation sensor readings to enhance radiation detection and measurement.	1 person	up to 3 months (Sep.-Dec.,2026)	Radiation Worker	Master or PhD degree, interest in radiation detection, electronics, machine learning, and computer vision
4-1	McMaster University Canada	Environmental Radiobiology	Dose reconstruction for field data-sets of non-human species in the Fukushima Exclusion Zone (FEZ)	The environmental risks associated with radiation exposure in the FEZ are far from clear. Much of the data correlates abnormalities or effects with ambient dose of radiation at the time the organism was examined but we now know that cumulative dose and dose experienced by ancestors of the current population can induce changes that are transgenerational. Calculating the historic dose is therefore important. This project will reconstruct the dose for data obtained from field radioecologists working in the FEZ and will validate effects seen by comparing results with laboratory data. The training for a student will involve dose modelling and at least two established methods of dose reconstruction. Hands on training will also involve laboratory experiments using tissue culture in our Level 2 biosafety laboratory and exposure of arthropods to radiation in the Tandem Accelerator facility at McMaster which is a world class centre with multiple radiation sources. This is in order to validate the data generated from modelling exercises. Further training will involve preparation of presentations and papers for publication.	1 person	1-3 months (Aug.-Nov.,2026)	Non-Radiation Worker	Radiobiology, interested in modelling effects
5-1	Technical University of Munich Germany	Robotics & Remote System	Design, Assembly and Programming of a 3D Printed Low-Cost Robot Arm	In the project, participants learn to design a robot with an arm length of about 700mm, a self-weight of 2.5 kg (without power supply/battery) and a payload of 500g with Matlab, to manufacture it with 3D printing, to assemble the components and to equip a PC-independent controller with Arduino microcontroller. After the end of the project, the goal is to further develop these robots independently and to be able to produce such robots in large quantities in 3D printing within a few days in the event of a disaster.	1 person	2-4 months (Aug.-Nov.,2026)	Non-Radiation Worker	Master degree, interest in robot mechanics, microcontroller electronics, and programming in C and Matlab
5-2		Robotics & Remote System	Mechanisms Design and Precision Engineering of Revolute Joints	In this project the participants shall learn to design motion machines, mechanisms like four-joint with Matlab and to realize them in 3D printing. Besides mathematical basics it is also necessary to gain knowledge about the production of mechanical fits and articulated joints with 3D printing. Precision joints between 1mm and 3mm are taught and their production in additive manufacturing from standard parts.	1 person	2-5 months (Aug.-Dec.,2026)	Non-Radiation Worker	Master degree, interest in higher mathematics, mechanism design, and fundamental problems in precision engineering and micro engineering
6-1	FH Aachen University of Applied Sciences Germany	Robotics & Remote System	Robotic Dismantling Strategies and Techniques for Activated Reactor Components	In this project, the participant will gain insight into both the strategic and technical approaches required for complex dismantling tasks. The primary focus lies in developing safe and efficient robotic methods for dismantling, conditioning, and packaging intricate multi-material components of the MTR-DIDO reactor at Jülich, such as the highly activated top shield. Key challenges include the remote or robotic handling at higher radiation levels, precision multi-material cutting, and the safe and precise remote loading of dismantled sections into waste containers.	1 person	6 weeks (Oct. 2026~ Dec. 2026)	Non-Radiation Worker	Master's degree, interest in robotics and mechanical design. A background in precision engineering, remote handling systems, or nuclear technology is desirable. Familiarity with radiation safety considerations, and experience CAD systems would be advantageous.

7-1	Pohang University of Science and Technology (POSTECH) Korea	Robotics & Remote System	Motion Planning of Ground Robot	This research focuses on safety inspection and emergency response missions in nuclear power plants using quadruped walking robots or tracked robots. By leveraging Physical AI, the robots are required to navigate narrow and steep staircases or inclined surfaces, avoid unexpected obstacles, and plan motion strategies to reach designated target locations. Upon arrival, the robots assess the situation at the target site and generate environmental maps to support situational awareness and decision-making.	Max. 2 people	1-3 months (Aug.-Dec.,2026)	Non-Radiation Worker	Robotics	
7-2		Robotics & Remote System	Nuclear Power Plant Safety Inspection Using Underwater Robots	This research involves the inspection of water tanks, reservoirs, and other submerged facilities within nuclear power plants using underwater robots. High-precision underwater lasers mounted on the robots are employed to generate detailed three-dimensional surface maps. In addition, underwater non-destructive testing (NDT) sensors are utilized to detect micro-cracks and perform comprehensive safety inspections of submerged structures.		1-3 months (Aug.-Dec.,2026)	Non-Radiation Worker	Robotics	
8-1	CEA France	Robotics & Remote System	Development of technology to support remote operation of the robot. (*1)	Introduce a fellow to the tool box developed in our lab for simulating, in VR, tasks related to the different operations needed during decommissioning. Namely Teleoperation with Haptics feedback, laser cutting, fine manipulation and point cloud handling. Simulation may serve as validating mission parameters and de-risking as well as training.	1 person	1-3 months (Aug.-Nov.,2026)	Non-Radiation Worker	Computer & Information	
9-1	The University of Manchester United Kingdom	Robotics & Remote Inspection	Development of cooperative underwater robots for decommissioning operations	This project supports the development of a system for cooperative manipulation using underwater robots equipped with grippers for decommissioning operations such as retrieving and transporting large pieces of debris. The research will focus on various aspects related to control and multi-agent coordination, including real-time obstacle avoidance and servo-visual control, depending on the researcher's skills.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	
9-2			Development of robotic gloveboxes for decommissioning operations	This project supports the development of robotic gloveboxes, e.g., for post-operational clean-out operations (POCO). The research will focus on the use of manipulators with a large number of degrees-of-freedom and investigate important aspects in robotic control, such as dexterous teleoperation in cluttered environments, assistive teleoperative strategies, and their combination with machine-learning methodologies and simulation, depending on the researcher's skills.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	
9-3			Development of a robotic inspection system for exploration and characterisation of unstructured environments	This project aims to contribute to the development of an advanced robotic inspection system, specifically designed for environment exploration and characterization in nuclear decommissioning. The system will enhance the sample retrieval process, functioning in collaboration with human operators. The research will focus on one of the following aspects: the design of tactile end-effectors, robotic navigation and control, contaminant detection, the design of artificial sensory feedback, and human-robot shared control strategies, depending on the researcher's interests and expertise.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	
9-4			Development of a Unmanned Aerial Systems capable of inspection in confined spaces	This project aims to contribute to the development of an unmanned aerial system (UAS) capable of inspections in confined spaces. Confined spaces pose a significant challenge for autonomous exploration using an UAS. This is particularly true as UAS needs to fly as quickly as possible to preserve flight time and thus increase the inspection area. This project aims to explore methods of mitigating of some of the risk associated with high speed flight in such a confined environment. The research will focus on various aspects, such as path planning, obstacle avoidance, autonomous exploration, mission planning, machine learning and SLAM depending on the candidate preference and experience.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	
9-5			Development of Nvidia Omniverse Digital Environments for Corroborative Verification of Robotic Systems	This project aims to develop photorealistic Nvidia Omniverse digital environments which can be used as part of a Corroborative Verification and Validation (CV&V) process for robotic inspection systems. V&V is a critical element of developing assurance cases to allow the deployment of autonomous robots onto nuclear sites, however the gap between abstract modelling for formal verification and real-world deployments is quite large. The development of photorealistic environments with realistic physics, able to simulate deployable robot code, could significantly enhance the V&V process and speed up the deployment of robots.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	
9-6			Development of a Sample Retrieval Robot for Confined and Restricted Access Areas.	This project aims to contribute to the development of a reconfigurable robot which can be deployed into restricted access areas to retrieve environmental samples. Using the MIRRAX robot as the base platform, this research will explore the integration of a manipulator and vision system to enable sample retrieval, either tele-operated or semi-autonomously.	1 person	3-4 months (-Dec.,2026)	Non-Radiation Worker	Robotics, Computer & Information	