UK Atomic Energy Authority

LONGOPS RESEARCH & DEVELOPMENT OPPORTUNITIES

Supplier Engagement Event – 24th June 2021

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This work has been funded by the UK Government Department for Business, Energy & Industrial Strategy.

Long Reach Mechanisms Technology Development

WBS	Budget	Estimate Tender Publication	Estimate Contract Duration
3.3.1	£100k – £200k	September 2021	December 2021 - April 2023
3.3.2	£100k – £200k	September 2021	December 2021 - April 2023

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WP3.3.1 – Operator Teach-File Planning Assistance

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Aim of the Work Package

To assess and develop techniques for improving operator efficiency during planning remote tasks, and for reduction of effective training time required.

To develop enhanced robot planning tools that leverage the latest advances in robotics and human-robot interaction to improve overall efficiency in predefining robot motion and action plans

To investigate and develop technology with new capabilities such as operator-in-the-loop automated path planning, automated collision avoidance, and improved Operator situational awareness.

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WP3.3.1 – Development and assessment of enhancements to robot planning tools

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Task Requirement

Produce an integrated architecture that encapsulates a combination of technologies into one system to facilitate and improve task planning for Operator.

Integrate proposed task planning solution into the NG-DMU system.

Develop technique that adapts the proposed task planning solution into existing teach files for use at RACE and similar sites.

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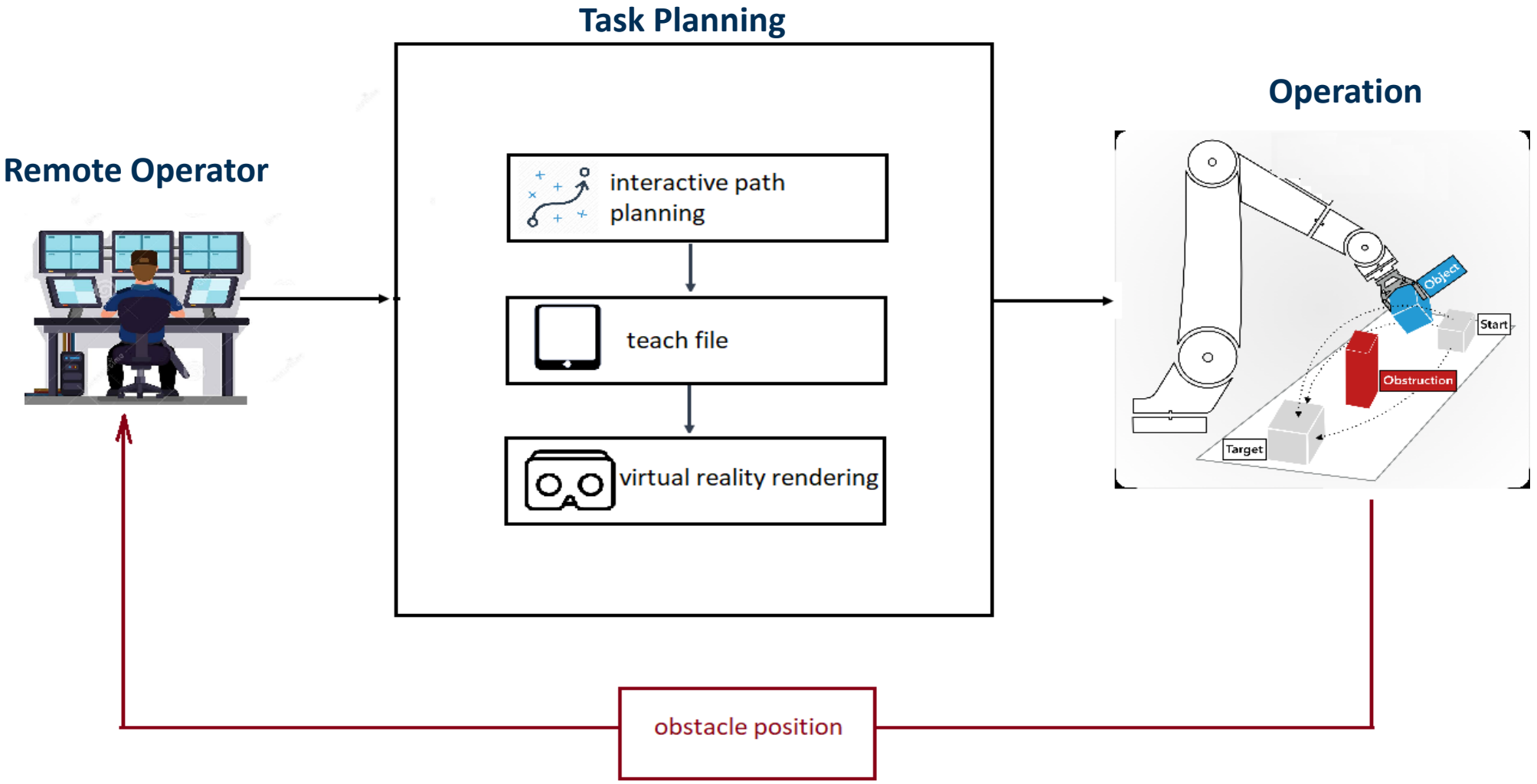
WP3.3.1 – Development and assessment of enhancements to robot planning tools



WP3.3.1 – Development and assessment of enhancements to robot planning tools

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Desired skills:

Robotics

Virtual Reality

Human-robot-interaction

HMI development

Computer vision

Control system

Task planning

Outputs

Control software prototype extensible to RACE RO use case

System demonstration and User manual

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WP3.3.2 – De-risking Long Reach Mechanisms

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Aim of WP

To conduct investigations that identify and evaluate possible solutions to challenges associated with long-reach flexible manipulators.

To investigate and develop technologies for correcting positional inaccuracies and reduce vibration encountered in long reach manipulators especially in cluttered environment

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WP3.3.2 - Technology development for accurate control of long, slender, flexible, high-payload articulated deployment booms

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Some of the possible options include but not limited to:

Kinematics and dynamics models and characterisation that builds in flexible deformation

Control approach for static compensation and vibration damping

Characterisation of physical structure properties for long reach manipulators

Vibration detection, measurement and suppression systems for long reach manipulator

NB. Other potential solutions are welcome

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WP3.3.2 - Technology development for accurate control of long, slender, flexible, high-payload articulated deployment booms

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Desired skills:

Robotics

Vibration and control

Mechanical engineering

Control systems

Virtual reality

Modelling and simulation

Outputs

Demonstration of the system for TEPCO LongOps use Case

Deliverable report (algorithms, codes, etc.)

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