2025 START Program
CFP Brief

THEME: **05. Robotics**

SUB-THEME: **5.1 Robotic foundation models with seamless human robotic interaction**

Context/ Overview

The future of robotics is exciting and promising, with advancements in artificial intelligence, machine learning, and computer vision. These technologies will enable robots to become more autonomous, flexible, and adaptable to different environments. However, today's robots still could not interact with human smoothly. Robot could finish some specific tasks for humans and walk like a human being on the street based on advanced locomotion. But it is difficult for robots to feel our emotion. It is still difficult for robot to collaborate with human to finish some tasks together. It is almost impossible for robots to remember your preference and interact with you like your true friend. These are the problems we try to solve together with you.

Problem Statement

This call for proposal is to develop technology to enable smooth human robot interaction (HRI) so that robots can talk and work with you as your true friends. In order to achieve this goal, robots will have to understand you, know your emotions, gestures, your facial expressions via all the sensors installed such as microphones, cameras, tactile sensors and so on. Furthermore, after perception, robots may have to reason and take corresponding actions based on detected emotion, gesture or facial expressions and so on. Robots should also remember your preferences and maintain a long-term memory about what happened at home so that it could smoothly talk with you.

Objectives & Scope

To solve the problem above, please consider the following selected topics and focus areas. Feel free to come up new ideas to enable smooth human robotic interaction.

Specific Topics & focus areas

1. Develop multi-modal human emotion/gesture/facial expression recognition solution.
2. Develop foundation model or embedding encoders for robot control taking the emotions/gestures etc. as input so that the human robot interaction could be smooth.
3. Develop solutions to enable robots with long-term memory.
4. Develop solutions to enable robots to reflect human preference when finish tasks.
5. New areas and technology to enable smooth human robotic interaction.

※ The topics are not limited to the above examples and the participants are encouraged to propose other original ideas.

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