GENERATING VISUALISED FLOW-BASED PROGRAMMING FOR ROBOTS USING VERBAL/LANGUAGE-BASED USER DESCRIPTIONS

CHALLENGE OWNER

The Challenge Owner KABAM Robotics was founded in December 2020 to address global labour shortage and rising manpower costs. The company aims to revolutionise the security industry by leveraging robotic connectivity technologies to build

KABAM's current system presents the

Able to interpret language statements. Engage with the user through either voice or text inputs, to interpret statements referring to objects in the real world, specific to deployment sites e.g. stairs, infodesk, elevators, etc. For the purposes of the prototype, the solution will need to be contextualised to robot platforms and deployment sites.

Seek clarification. To avoid AI hallucinations, the solution should be able to identify information gaps when it encounters unknowns and prompt the user for clarification.

Generate visualised and editable flow based programming. The output of the process flow should be visualised on a user interface, making it easy to programme and edit.

Accommodate complexities. Generate missions across a range of complexities, from basic process flows (e.g. standard template process as foundation to generate more instructions) to fully customised and complex missions involving triggers.

Version control and history. Users should be able to undo or redo actions and access past versions of the generated process flows.

Embeddable into existing Smart+ web app. Ideally, users should be able to access the solution through

Customer retention and robot utilisation. 30 50% increase as customers experience higher mission success rates and increase ease in mission creation, leading to higher robot utilisation rates.

POSSIBLE USE CASES

1. Customer creates mission independently. Sam is a site operator working at a train station. He wants to programme the robot to execute a security mission to patrol the platform and report any abnormal activities. He is onboarded to the new programming tool by KABAM's customer success team. He goes into the Smart+ web app to access the mission creation tool, which shows him sample statements, and he inputs the statements he believes encapsulates his intended mission for the robot. The mission creation tool prompts Sam for further clarification, including definitions of some terms he used, before generating the first iteration of the visualised process flow. Sam analyses it and gives the system a thumbs down to indicate that the process flow is not what he needs. The tool generates a different process flow. Sam assesses that it is 90% right and edits it manually to finalised the exact mission he wants.

   Sam applies the mission to the robot which begins patrolling. The robot meets an obstacle on site and reports the mission failure, prompting Sam to edit the mission to account for the obstacle. Sam notices that he made an error previously and edits the process flow. The process flow is refined and reapplied to the robot which then completes a perfect mission.

2. On site mission creation and execution. Elly is a member of public, visiting a new mall with her family. She notices that it is time to nurse her child and she is looking around to find the nearest nursing room. As she is unfamiliar with the mall, she walks up to a robot and asks where is the nursing room. The robot receives her verbal instructions and prompts Elly for clarification on which nursing room she would like to go to. Elly responds that she would like to get to the nearest nursing room on level two. The robot receives the clarification and generates the mission backend. The robot proceeds to guide them to the nursing room on level two.

WHAT'S IN IT FOR YOU

SGD50,000 of prize money for each winner of this challenge (see Award Model)
SGD150,000 A*STAR funding for technology development*
3 year ROS Industrial Consortium Membership
Access to IMDA's PIXEL corporate innovation hub and complimentary innovation consultancies (e.g. Design Thinking, Digital Storytelling) for the prototype development/f0 0 1 T f [ ) 6 6 (the)] T J f 0

Solution Readiness (30%)	Maturity: How ready is the proposed solution to go to the market? Scalability: Is there any evidence to suggest capacity to scale?
Solution Advantage (20%)	Quality of Innovation: Is the solution cost effective and truly innovative? Does it make use of new technologies in the market, and can it potentially generate new IP?
Company Profile (20%)	Business Traction: Does the product have user and revenue traction? Team Experience: Do the team members possess strong scientific/technical background?

AWARD MODEL

30% of the prize money will be awarded to each selected finalist at the start of the POC/prototype development process. The remaining 70% will be awarded after completion of the POC/prototype solution, based on milestones agreed between Challenge Owner(s) and the solver. Prize money will be inclusive of any applicable taxes and duties that any of the parties may incur.

Note that a finalist who is selected to undertake the prototype development process will be required to:

- Enter into an agreement with Challenge Owner(s) that will include more detailed conditions pertaining to the prototype development;
- Complete an application form with IMDA that will require more financial and other related documents for potential co funding support.

DEADLINE

All submissions must be made by 13 Sep 2024, 1600 hours (SGT/GMT +8). Challenge Owner(s) and IMDA may extend the deadline of the submission at their discretion. Late submissions on the OIP, or submissions via GeBIZ, will not be considered.