Demonstration of a Social Robot for Control of Remote Autonomous Systems

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ABSTRACT

There are many challenges when it comes to deploying robots remotely including lack of situation awareness for the operator, which can lead to decreased trust and lack of adoption. For this demonstration, delegates interact with a social robot who acts as a facilitator and mediator between them and the remote robots running a mission in a realistic simulator. We will demonstrate how such a robot can use spoken interaction and social cues to facilitate teaming between itself, the operator and the remote robots.

KEYWORDS

Remote robots; autonomous systems; conversational agent

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1 INTRODUCTION

Robotic and autonomous systems are being deployed in remote, hazardous locations. In such scenarios, human operators need to be kept continuously in the loop with the remote robots for safety reasons [4]. Studies have shown that keeping situation awareness high is particularly challenging with robots that are out-of-sight, thus decreasing trust [2] and creating a barrier to adoption for these key systems that keep humans out of harm's way [6]. We propose a mediator robot that is able to portray social signals to break down these barriers through human-robot interaction.

We present recent work, as part of the EPSRC ORCA Hub [3][1], in the form of a demonstration of a voice-enabled automated assistant to help manage these types of scenarios, where robots are doing tasks autonomously and remotely. Here, we embody the voice-enabled assistant as a Furhat Robot [1] to enable natural interaction and facilitate research into whether social signals can help manage trust and increase adoption.

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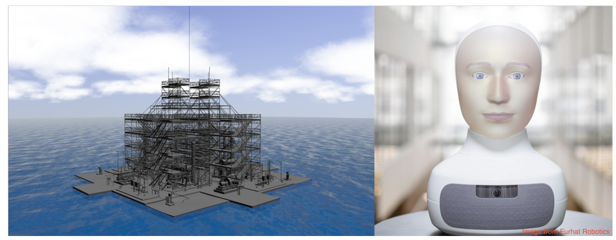

Figure 1: The Digital Twin of an offshore platform, on the left, where an emergency scenario will play out with the social Furhat robot, on the right.

2 THE DEMONSTRATION

In the demonstration, delegates will interact with the fully autonomous Furhat robot (see right of Figure 1) and be involved in a short game scenario. This scenario involves an emergency on an offshore energy platform, where there are two types of robots available to facilitate the task: Husky land-based robots and Quadcopter Unmanned Aerial Vehicles (UAVs). Specifically, participants are given a limited time (3 minutes) to extinguish a fire and assess the damage. If they do not complete these tasks within the time, they are told to evacuate the platform. This scenario will play out on a laptop next to the robot running a realistic Digital Twin simulator [5] (see left of Figure 1). This demonstration will provide a fun, immersive experience for delegates, who will be able to interact with a social robot, as well as, gain an understanding of the challenges of remote robots and autonomous systems.

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