Robot Student Ambassadors: Using Service Robots for Community Engaged Events

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Abstract

Universities are increasingly exploring how service robots can be used as tools for public engagement and outreach with communities. This work investigates the use of service robots deployed at outreach events such as open days and community events like STEM Festivals to promote the university and engage positively with the public. Two service robots, Cruz and Marshmallow, have been deployed across multiple community-based events. Observations focus on visitor interactions and explore the different uses for these robots in community settings. Early results demonstrate strong user engagement and facilitated discussion about university research. The presence of these robots lowered barriers for community members, particularly children, who engaged naturally through touch, speech and playfulness. Findings suggest that robot ambassadors can enhance community outreach and enrich campus experiences. They appear to be valuable for engaging with young audiences and supporting informal learning, generating awareness of cultural and community perspectives.

Author Keywords

Social robots; service robots; communities; human robot interaction



(a) Cruz and the Cultural Narrative Tour



(b) Marshmallow at NerdFest

Figure 1: Robot Student Ambassadors

CCS Concepts

•Human-centered computing → Human computer interaction (HCI); •Computer systems organization → Robotics;

Introduction

At the University of Waikato in 2023 Au Reikura School of Computing and Mathematical Sciences purchased two service robots, specifically KettyBots by Pudu Robotics[1], fondly named Cruz and Marshmallow (see figure 1). The purpose of these purchases was to enable human-robot interaction research, support teaching in human-centred computing and allow the School and consequently the University to engage with the community in meaningful ways. Both robots are used as "robotic student ambassadors" one for each of the University's campuses, Cruz being based in Tauranga and Marshmallow in Hamilton respectively.

[1] See https://www.pudurobotics.com/product/detail/kettybot.

Community Engagement

With the purchase of the new robots, it became clear that exploring new modes of interaction with the community was necessary. KettyBot's were primarily designed as service robots. Some of their functions include serving in restaurants, advertising in malls or even giving guided tours of a business. However, using these commercially developed robots for community events creates new challenges. We outline our early results below.

STEMFest '23

The Tauranga STEM Festival (STEMFest) is a free, multi-award winning community event that brings together exhibitors to offer hands-on STEM activities [2]. Cruising mode allowed the robot to explore a loop of the event, giving information about the Computing programmes on the advertising screen as well as handing out free brochures and lollies. The event demonstrated its ability to engage meaningfully with children, who took advantage of its obstacle avoidance to "herd" the robot. Furthermore, all lollies were gone within approximately 30 minutes of the event starting. Marshmallow was similarly rolled out at NerdFest, featuring a costume as it took place on Halloween (see figure 1b).

Tauranga Campus Cultural Narrative Tour

The self-guided Cultural Narrative Tour guides visitors through artworks by award-winning local artists that express the campus' woven cultural heritage, identity and relationships across Tauranga-Moana and the Bay of Plenty[3]. To explore the guiding capabilities of the robot in a community setting, we set up a guided tour throughout the campus using Cruz. The robot would stop in front of each artwork and play an audio clip telling the user the narrative of the piece. We ob-

[2] See https://www.taurangastemfestival.co.nz/

[3] See https://www.waikato.ac.nz/about/campus/tauranga/cultural-tour/#introduction

served users naturally following the robot from artwork to artwork and listening to the cultural significance and the stories of the local indigenous people.

Workshop Relevance and Reflections

Our early deployments of Cruz and Marshmallow across community events offer concrete insights into how community-oriented interactions can be developed to engage meaningfully with diverse users.

Collective Needs and Goals

Our observations show that robots can act as scalable social tools, holding attention, delivering consistent scripted information and encouraging exploration that human guides cannot always sustain regularly. At STEMFest and NerdFest, autonomous looping allowed the robots to interact with hundreds of children and families, capitalising on the novelty factor and distributing more resources than our human student ambassadors usually achieve. The Cultural Narrative Tour further demonstrated the robot's ability to guide large groups and engage with significant stories to the area when Māori elders or guides are unavailable. These deployments highlight community robots' unique ability to service as persistent touchpoints for education, outreach and cultural storytelling.

Benefits from Shared Community Robots

The Cultural Narrative Tour with Cruz showcases how robots can help surface indigenous narratives, making cultural learning more widely accessible. Across both cases, the robots function as "public digital infrastructure", being mobile and visible embodiments of the University's identity that strengthen a sense of connection and shared community experience.

Evaluation, Governance and Sustainability of Community-oriented Robots

In community settings, robots may interact with a large volume of people, where health and safety becomes important. For each deployment we ensured a human "spotter" was used to ensure safe interactions, particularly at large community events such as STEMFest or NerdFest. In the case of the cultural narrative tour, there are distinct governance considerations. Cultural narratives must be conveyed respectfully, accurately and with appropriate permissions, especially when representing indigenous stories. To evaluate community robots effectively, metrics should explore cultural appropriateness, inclusivity, trust and long-term community-value.

Computational and Interaction Design Challenges

Our deployments highlighted interaction-design challenges inherent to robots intended for broad public use. Navigation is unstructured, high-traffic environments require predictable behaviour for users to follow and multi-modal communication (audio, visual and movement cues). Children "herding" the robot revealed unexpected interactions and emphasises the importance of designing behaviours resilient to playful interference. Using an off-the-shelf service robot also limited how deeply the robot itself could participate in the cultural narrative it was guiding. A purpose-designed community robot, with input from local communities and the artists from the tour, could become an artwork in its own right, amplifying the cultural experience rather than merely facilitating it. This demonstrates the opportunity for future community-oriented robots to embody local identity, not only present it.