Testing HospiBot at OUH

TZ5 Work package

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HospiBot

Interreg Deutschland – Danmark

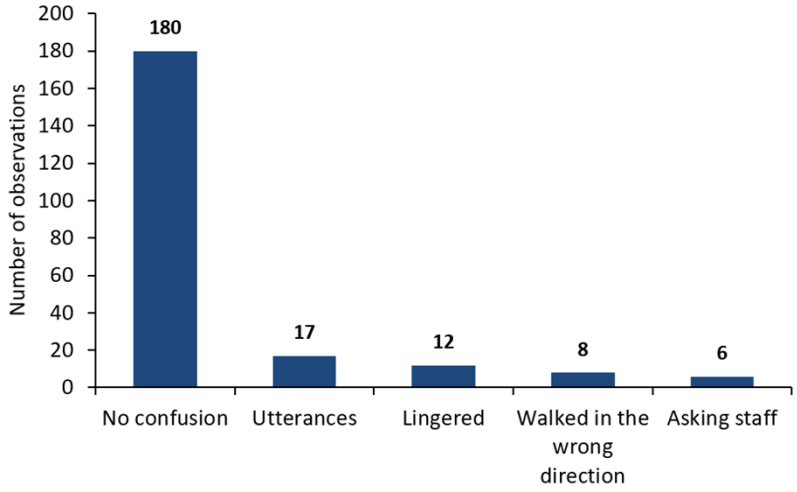
SDU

Introduction

- Our focus – testing the humanoid robot payload in the wild
  - OUH's Children's Department
- Conducting observations of patient behavior
  - Registration of parking
  - Checking in
  - Confusion on navigation
- Interviewing healthcare staff
- Testing HospiBot

Observations

- Observations
  - Fly-on-the-wall
  - Peak hours (8 AM – 2 PM) over three separate days
  - Conducted at the entrance
    - Registration and waiting room in sight
- Results
  - 224 observations, 458 people in total
  - Categories of expressed confusion
    - Few confused entrants
    - Time expended was high when asking staff



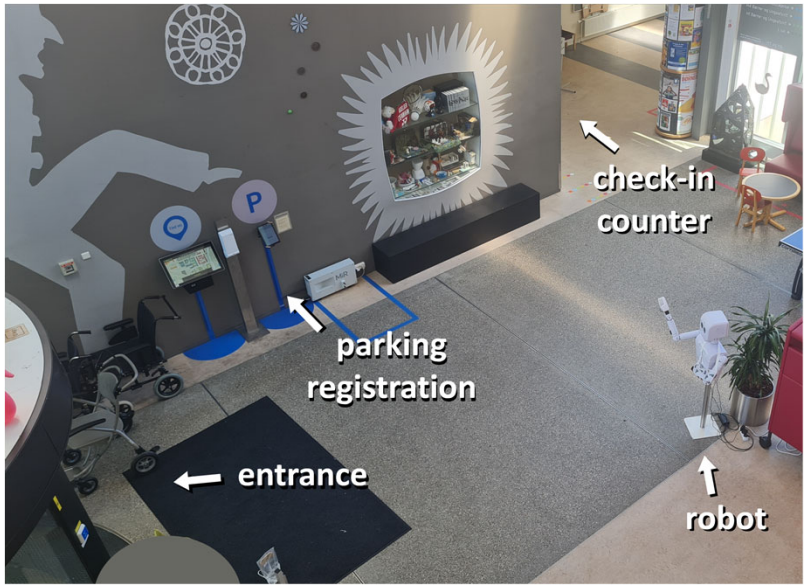
Interviews

- Interviews
  - Two-fold focus
    1. Verify the assumption of patients and their families having trouble navigating
    2. Clarify the degree of the interruptions caused by entrants asking
  - A variety of participants
    - 20 participants
    - Medical secretaries, service receptionists, service workers, volunteers, nurses and a doctor
- Results
  - Parents to the patients are often ill-prepared for navigating
    - Stressed consultations
  - 13 of 20 often help distressed parents (10-20 times a day at the max.)
  - Uncertainty as to who should help the entrants navigate

Initial HRI Experiment

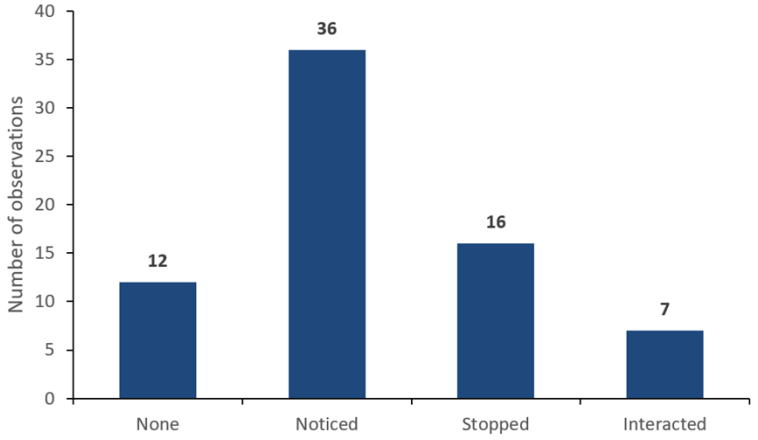
- Robot facing the entrance to the hospital
- Remote-operation
  - Pre-recorded arm movements and voice lines

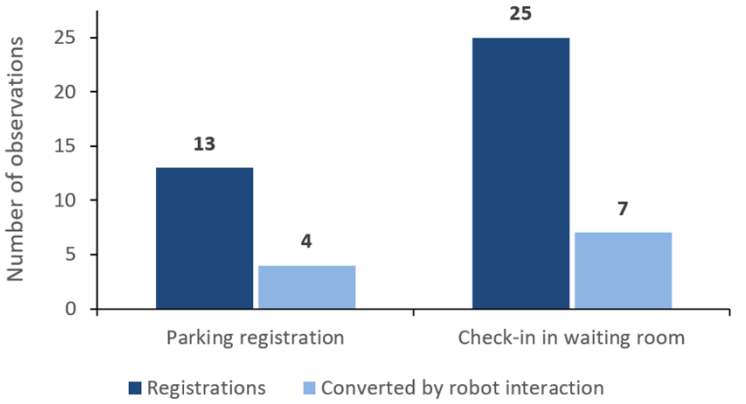
1. Welcoming the entrant
2. Notifying the entrant of the location of the parking registration and check-in screens
3. Interaction dialogue



Initial HRI Experiment results

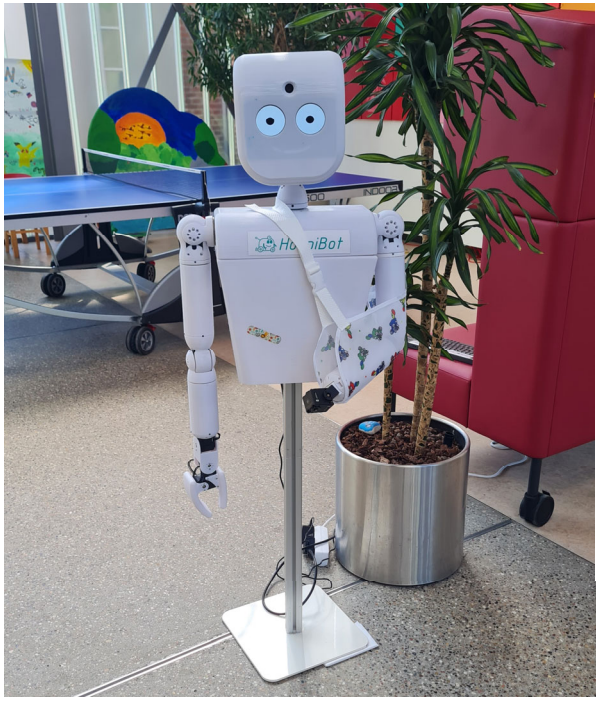
- Behavior around the robot
  - 75% noticed the robot
  - 14% interacted with the robot
- Action conversion
  - 31% of those registering their parking did so after being prompted by the robot
  - For check-ins 28% did so after being prompted by the robot
- Other observations
  - Entrants avoiding the robot





Suggestions for future work

- Comparing the current situation vs. with the robot
- Surveying healthcare staff to verify navigational needs are met and identify other benefits



Hospibot development group

Alberto Vicente Chacón
Anthon Kristian Skov Petersen
John Allan Brøndum Holm Øllgaard
Tamás Gábor
Peter Khiem Duc Tinh Nguyen

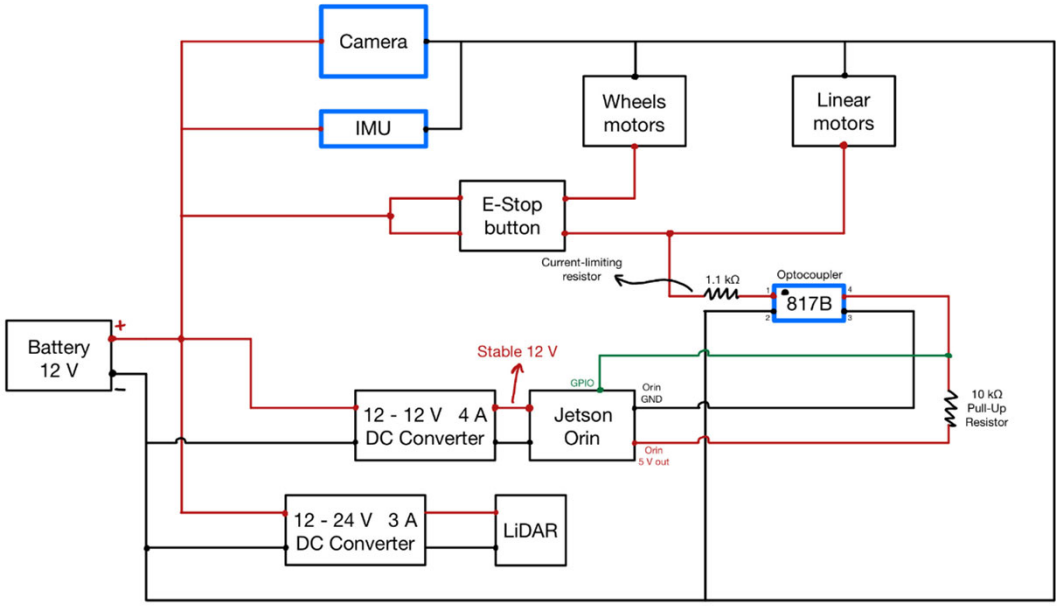
Contents

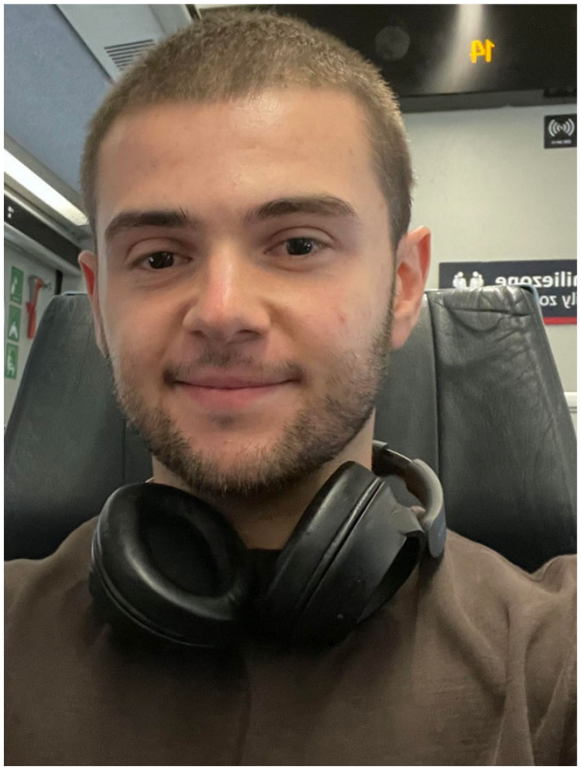
- Introduction to the hospibot (Physical capabilities, and software developed physical features (Emergency stop zone, Camera mount potential, linear actuators for payload lifting)
- Introduction to fundamental inspiration (handirob), its capabilities and its downsides (Capabilites → The handirob pipeline with screen and camera, Downsides → Computational inefficiency, Lidar constraints due to mirrored walls)
- Present the new features that has been developed and is under development on the hospibot, which was not possible on the handirob, due to its downsides (lidar is better, and computational device is stronger, this enables autonomous navigation)

- **Why did handirob have a lidar if navigation was not possible?**

Alberto Vicente Chacón

- Developing behavior trees for ROS2
- Working on the wiring design of the hospibot.





Electronics and automation engineer

Introduction to the hospibot

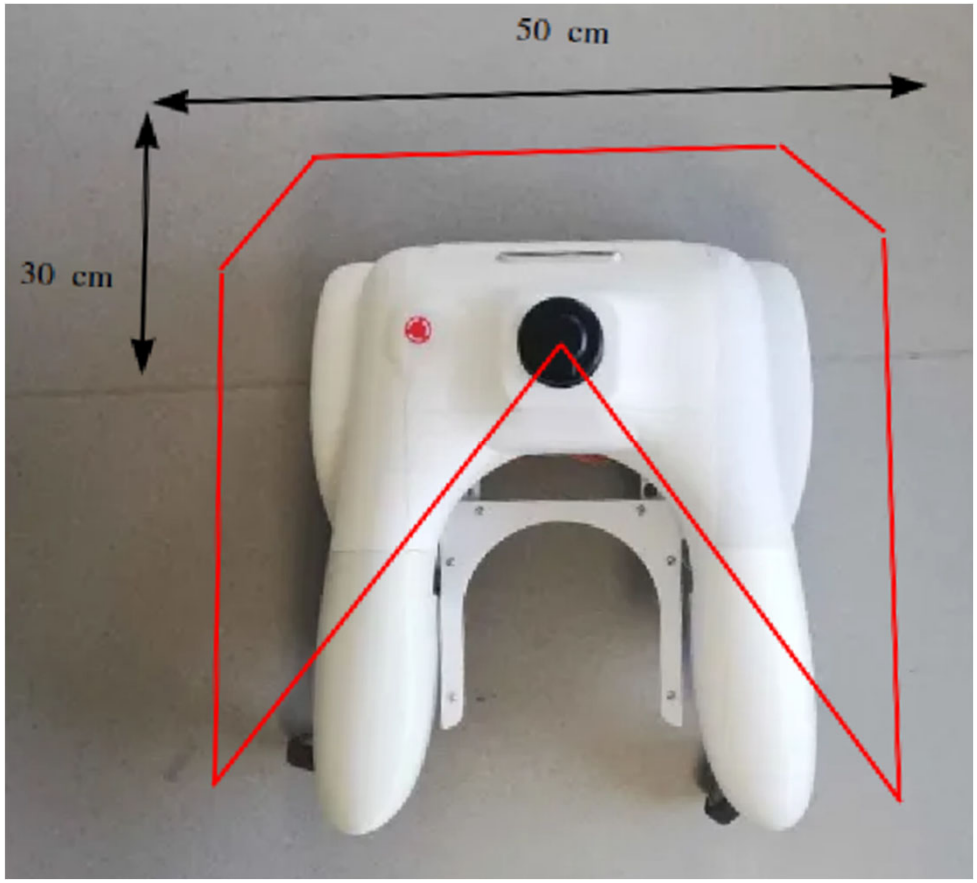
From handirob to hospibot

Handirob

Hospibot

.Stronger onboard computer
.More accurate lidar

Lidar emergency stop zone



Cartographer and navigation

Tested sites

- Mobile robotics LAB

Tested sites

.SDU TEK

Tested sites

.OUH

Tested sites

.OUH – Hallway

Features under development

- Implementing payload lifters
- Adding camera for payload detection
- Solving tasks using behavior trees
- Development of a hospibot version 2.0 with better interior and wiring design