Using AI-Enhanced Social Robots to Improve Children's Healthcare Experiences

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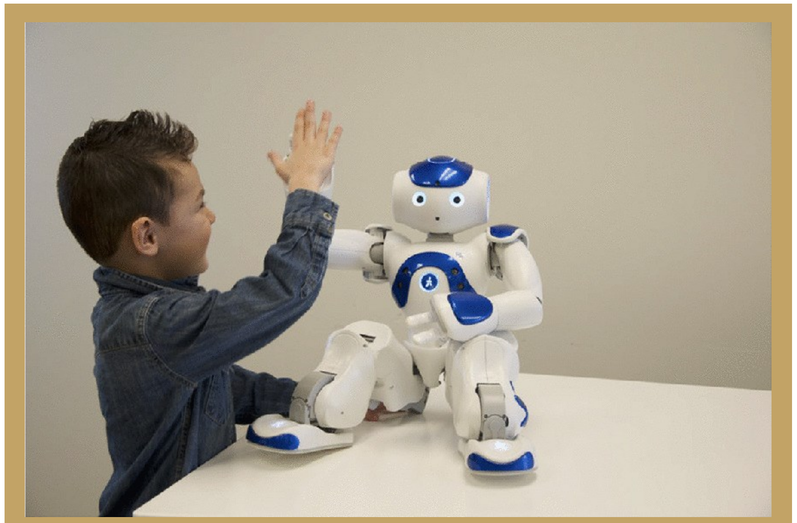

Children experience **pain and distress** in clinical settings every day, with negative short– and long-term consequences

Socially assistive robots have been tested in this context with promising initial results, but most have been **teleoperated**, limiting the flexibility and adaptability.

In a new project, we are developing an **autonomous and responsive** social robot designed to help children cope with painful clinical situations.

Task 1: Co-design and usability studies

Robot behaviours are being developed and refined in collaboration with children, parents, caregivers, and healthcare providers, using principles of user-centred interaction design.

Co-design: explore possible robot behaviours; investigate perceptions and views of all stakeholders

Usability: test integrated robot prototypes for robustness and appropriateness in context

Task 2: Technical development

Robot system is being developed to automatically and flexibly adapt its behaviour to the needs of the children.

- Social signal recognition
- Goal-directed epistemic planning
- Social signal generation
- Execution monitoring and recovery

Software will be developed as ROS components to allow interoperability and reuse.

Task 3: Clinical trial

Two-site randomised clinical trial involving paediatric emergency departments in Canada (same sites as for co-design/usability studies)

Compare observed distress and reported pain between two conditions (randomised):

- With robot present
- Existing standard of care

Goal is to recruit at least 80 patients

Task 4: Ethical and social implications

Examining the role of social robots in children's healthcare settings and linking results to the robot system developed in project

1. Literature review on AI, ethics, and healthcare
2. Extract questions and design input for co-design and usability studies; conduct content analysis
3. Include results from content analysis in final clinical trial design

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