

# TRIK: A Talking and Drawing Robot for Children with Communication Disabilities

## Purpose

To give disabled children an opportunity to explore linguistic communication.

To play and in the same time learn to use a method for alternative and augmentative communication.

## Target audience

Children with severe communication disabilities, such as:

- autism spectrum disorders, having extensive difficulties with representational thinking
- physical disabilities, for example, Cerebral Palsy (CP)

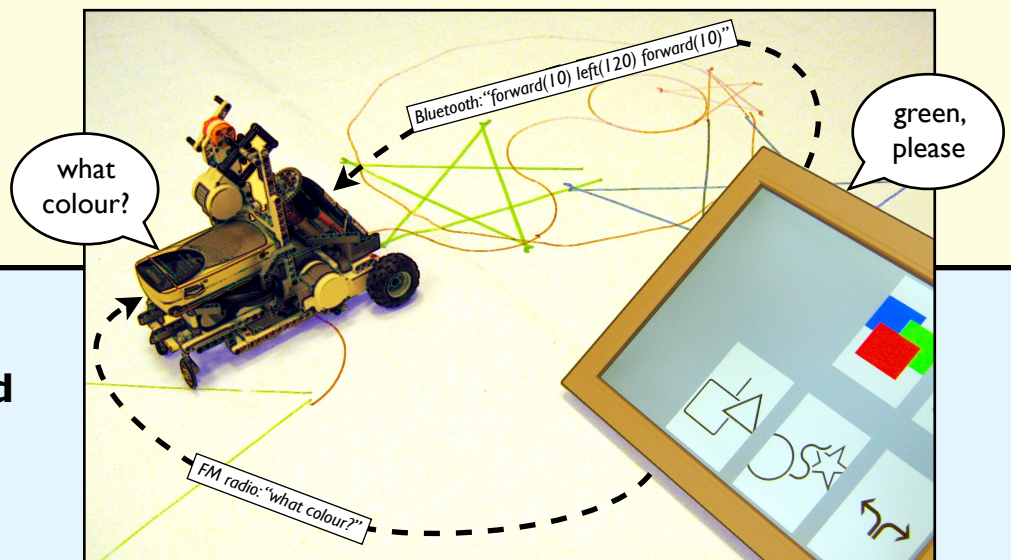
## Evaluation

We are evaluating two children with CP, and one child with autism.

- they play with the robot for about 20 minutes each, once every week, during 2 months
- the interaction is filmed and logged
- their communicative abilities are estimated, both before and after

## Lessons learned

- the design of the input panel depends on the specific disability
- the touchscreen can be difficult for children with CP
- flexible dialogue can be a problem for autistic children
- it is difficult to steer a turtle robot (what is right/left/forward/backward when the robot is facing you?)



## Communication board

- speech synthesis (different voices for the robot and the board)
- touchscreen
- computer speakers
- FM transmitter
- bluetooth

## Robot

- LEGO® Mindstorms NXT
- FM radio
- ink pens (red, green, blue)

## Perfect speech recognition

The robot does not actually have to listen for the speech generated by the communication board.

Both the robot's speech and the drawing commands are instead transferred wirelessly.

## Future plans

- more children to evaluate, and for a longer period
- a more robust system that can be started and maintained by teachers
- a plotter instead of a moving robot needs less space and can draw more complex pictures



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