

Design of a Multisensory Device

to facilitate interaction between cobots and autistic workers

Carla Dei
Scientific Institute IRCCS E. Medea



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Carla Dei - carla.dei@lanostrafamiglia.it



01 . Background: Autism and the labour market



Several studies report that people diagnosed with **autism spectrum disorders (ASD)** have low employment rates.

01 . Background: Industry 4.0



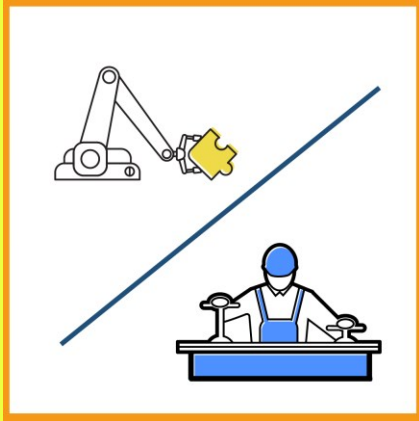
Industry 4.0 promotes new socio-technical infrastructure for workplaces and new workers' roles (*Xu et al., 2021*).

01 . Background: Collaborative robots (cobots)

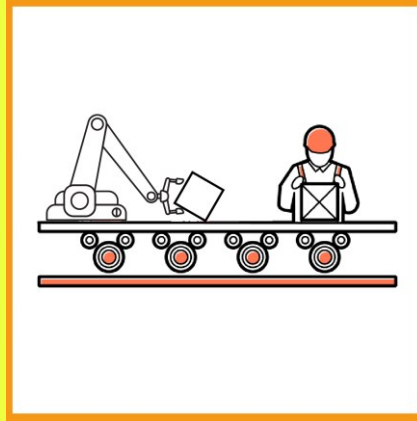


A cobot works in the same space at the same time with the worker and should be considered almost as a colleague (*Weiss et al., 2021*).

01 . Background: Human – Robot Interaction

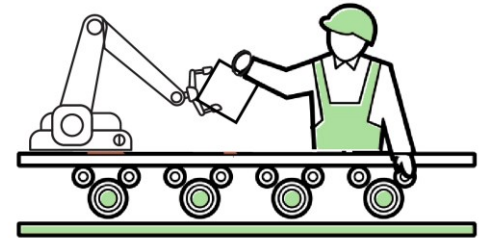


COEXISTANCE



COOPERATION

COLLABORATION

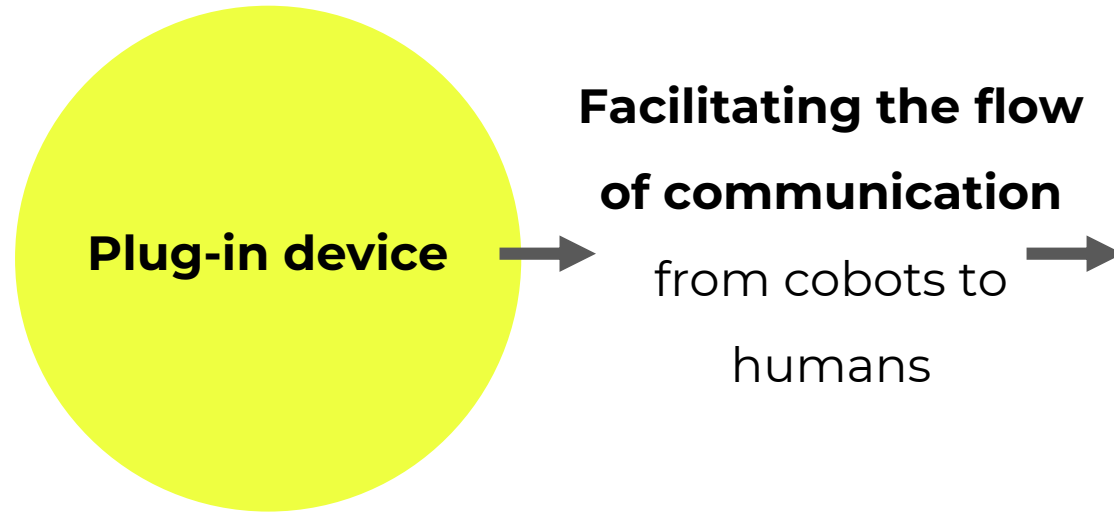


02. Research Proposal

Plug-in device

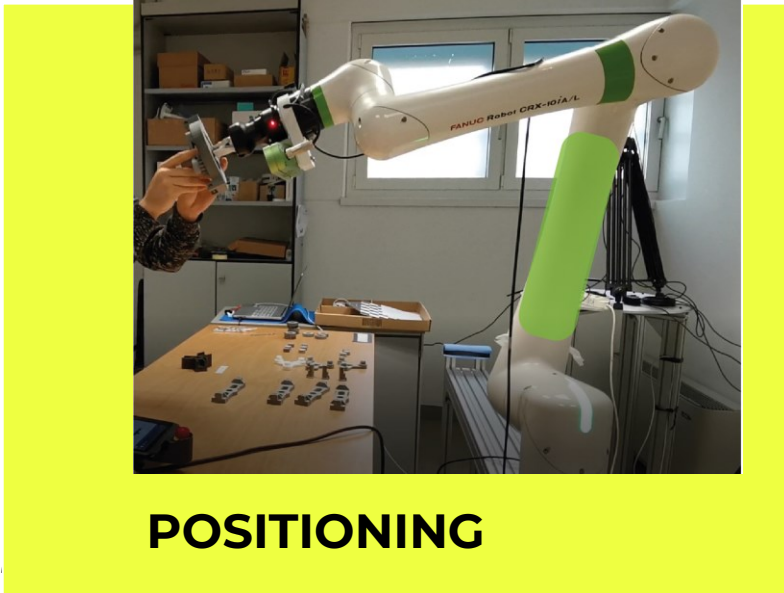
to facilitate the user experience of
ASD workers involved in activities
with collaborative robots (**cobots**).

03. Research Questions



- 01** . What kind of information should be transferred?
- 02** . Which is the best modality to do it without generating a negative impact on ASD workers?

04. Design Creation: Product Requirements



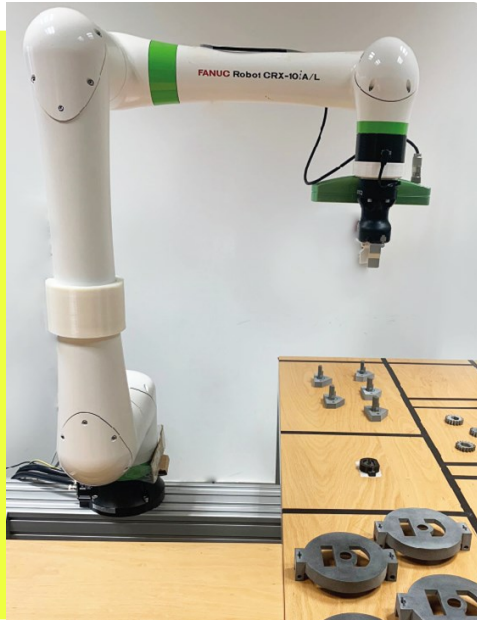
TECNICAL FEATURES:

- Colored LED strips;
- Speaker;

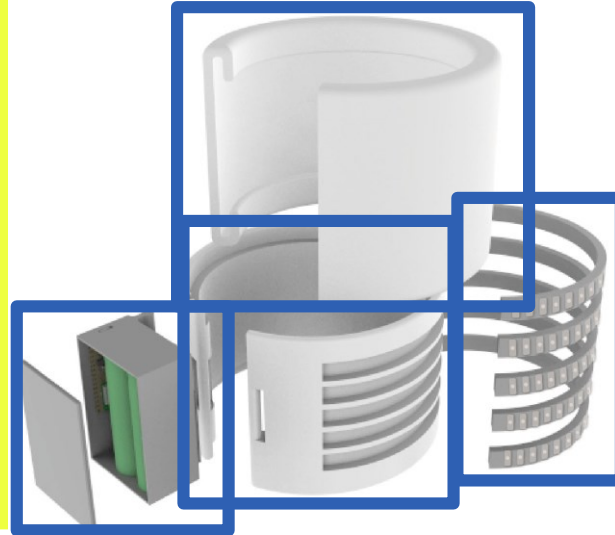
SHAPE'S CHARACTERISTICS:

- Adaptable to cobots of different sizes;
- Easy and intuitive to use;

04. Design Development: Final Shape



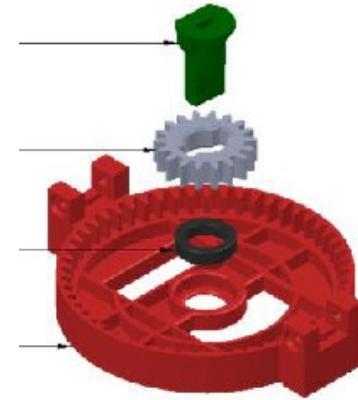
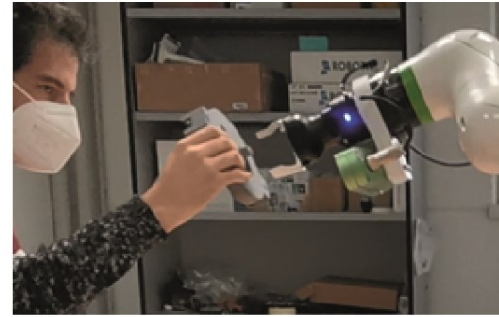
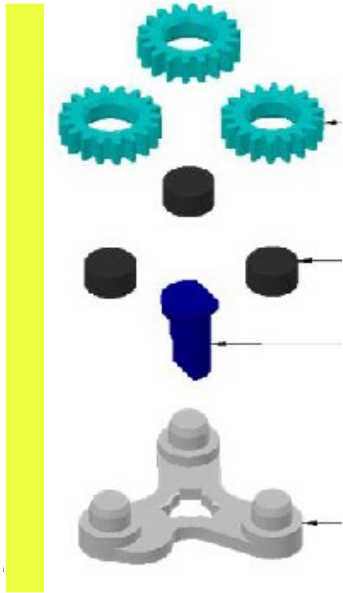
FLEXIBLE RING



**STATIONARY
BASE**

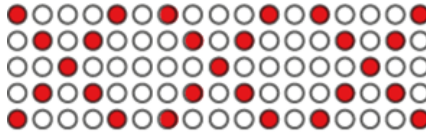


05. Case Study: Collaborative Task

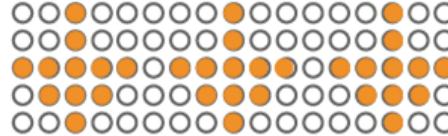


06. Feedback system: co-design with ASD users

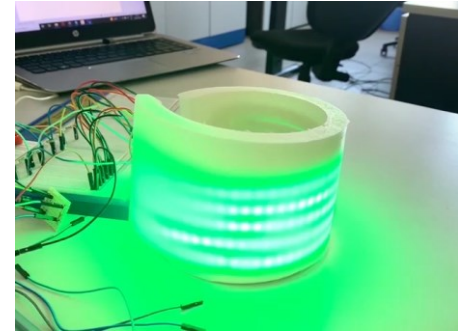
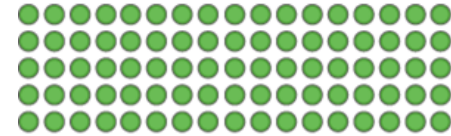
COBOT STOPS



SEARCHING PHASE



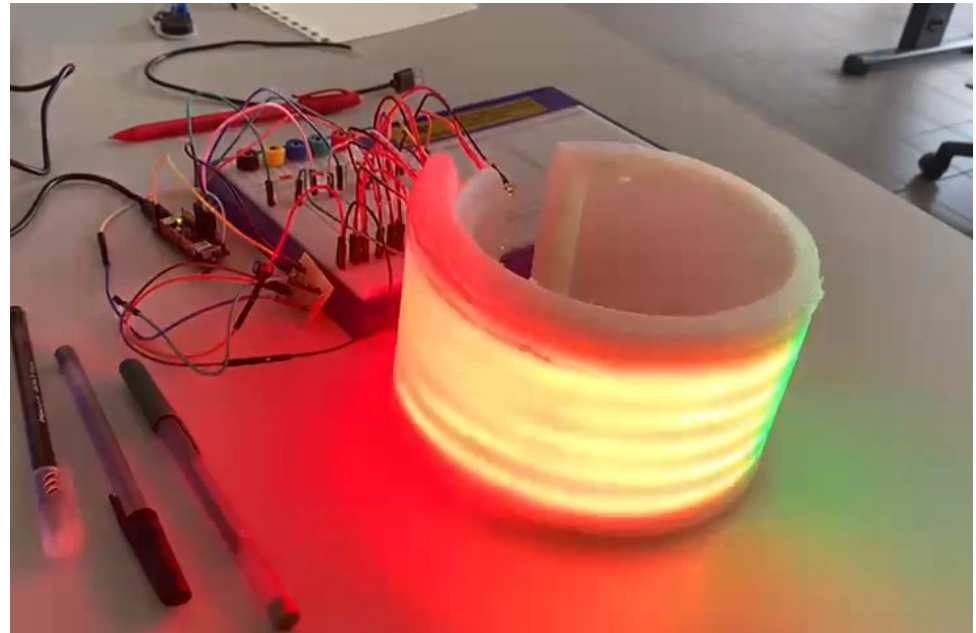
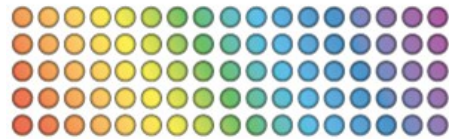
FINDING PIECE



06. Feedback system: co-design with ASD users (2)

WORKFLOW

(10 assemblies completed)



07. Next Steps

01.

Observation of the
user experience

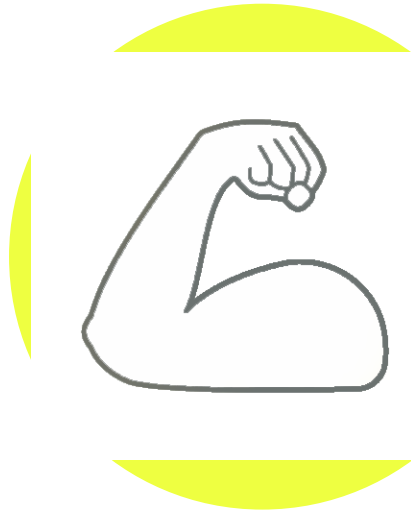
02.

Definition of
product identity

03.

Interface creation to
customise feedback

08. Research Challenges



01.

Recruiting more ASD users to involve in development of the feedback's design;

02.

Define the best modality to spread the sound feedback, considering the industrial noisy environments

09. Acknowledgements



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Thank you!



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