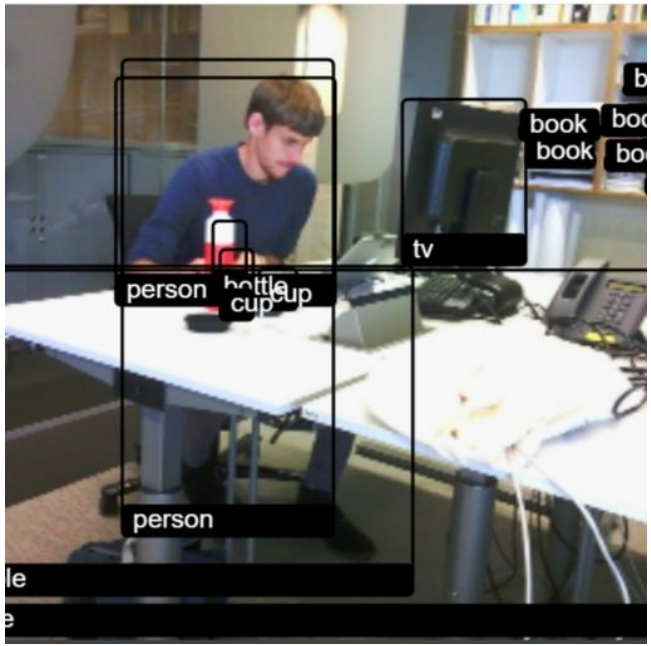
From dialogue to kinship and back

Communicative robots project - Jaap Kruijt

About me

- Started in September on the “Alani” project
- “Robot communication evoking affective bonding”
- How can we build a robot which responds empathetically to conversation partners, can act upon their needs, enables the conversation partner to form a bond with the robot and builds a personalised speech style with a conversational partner?
- First year: focus on kinship relations
- j.m.kruijt@vu.nl

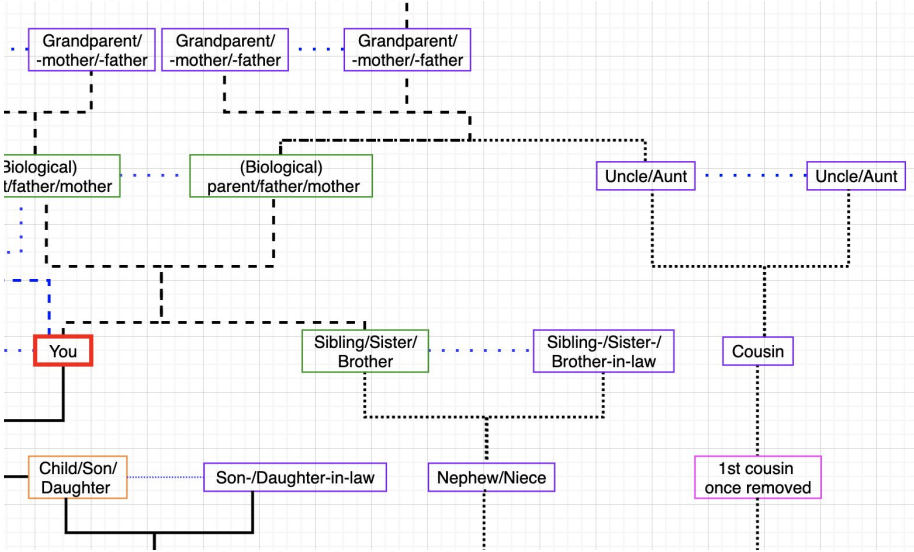


Patterns in the world: hard for robots to compute

- Relations and patterns are grounded in world knowledge
- Relations and patterns are based on multimodal input: vision, speech, muscle movements, …?
- Humans use pragmatic reasoning to deal with uncertainties

Kinship relations: not as easy as you might think

- “Last night I became a grandmother”
- Uncle: male sibling of (one of) your parent(s) OR male partner of the sibling of (one of) your parent(s)
- What is a sibling? What is a parent?
- How much does the robot need to know? For instance: whose grandmother?



What does the robot need?

- Note: this is the direction I am taking in my research. You can of course come up with alternative solutions!
- Ontology: (formal) definitions of concepts and relations
  - In the Leolani platform we use RDF triples (subject-predicate-object)

```
###  http://cltl.nl/leolani/n2mu/child-is
n2mu:child-is rdf:type owl:ObjectProperty ;
              rdfs:subPropertyOf n2mu:family-is ;
              rdfs:domain n2mu:agent ;
              rdfs:range n2mu:agent .
```

  - There is no adequate ontology for kinhsip yet

What does the robot need?

- Lexicon: defines which words relate exactly to which entry in the ontology
- Other solutions are of course possible, this is up to you

What can we work on?

1. Just the basics: making sure we have an accurate representation of kinship

Source: mentatdgt, https://www.pexels.com/photo/photography-of-a-beautiful-woman-smiling-1024311/

What can we work on?

1. Just the basics: making sure we have an accurate representation of kinship

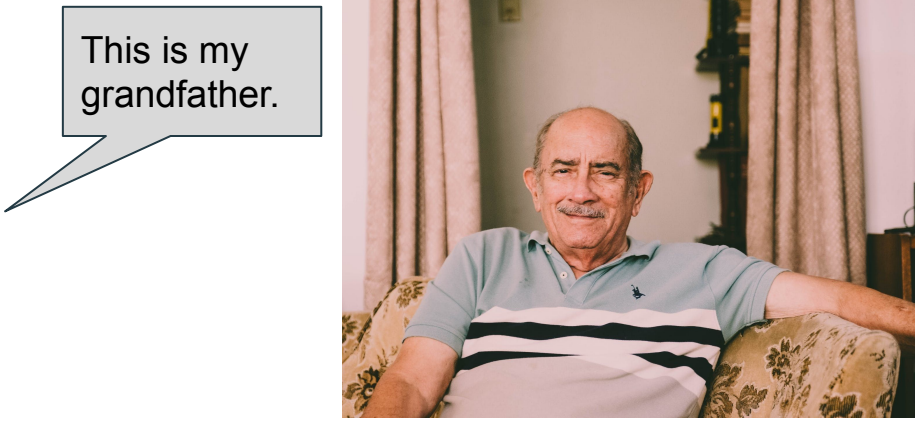
2. Adding ambiguity: who is who?

They are my brother and sister.

Source: Suzy Hazelwood, https://www.pexels.com/photo/a-vintage-photo-of-lovely-siblings-3672871/

What can we work on?

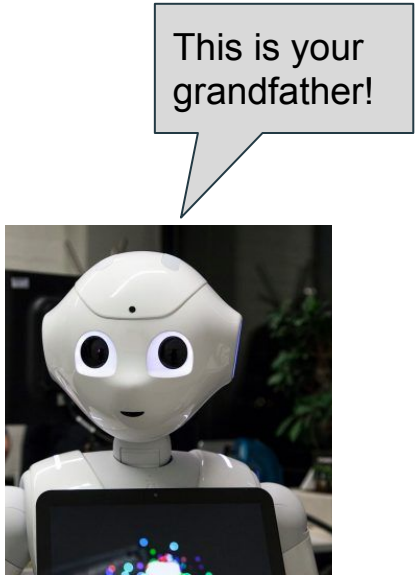
1. Just the basics: making sure we have an accurate representation of kinship
2. Adding ambiguity: who is who?
3. Missing information: should the robot ask?



Source: Steshka Willems, https://www.pexels.com/photo/shallow-focus-photo-of-man-3018993/

What can we work on?

1. Just the basics: making sure we have an accurate representation of kinship
2. Adding ambiguity: who is who?
3. Missing information: should the robot ask?
4. Adding language generation: which words should the robot use?



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Relation to other projects

- Tae: Multimodal signal processing
  - Can the robot use visual information to help disambiguating kinship terms?
- Lea: Ethical considerations
  - Should the robot wait for verbal confirmation before assigning gender?