

Group Dynamics in Human-Robot Collaboration

Filipa Correia

Postdoctoral Researcher



**Who is Filipa
Correia?**

Who is Filipa Correia?

**Researcher on
Human-Robot
Interaction**

Who is Filipa Correia?

**Researcher on
Human-Robot
Interaction**

Computer Science

Robotics

Psychology

**What is my
research
mission?**

What is my research mission?

**How can we develop
social behaviours for
robots?**

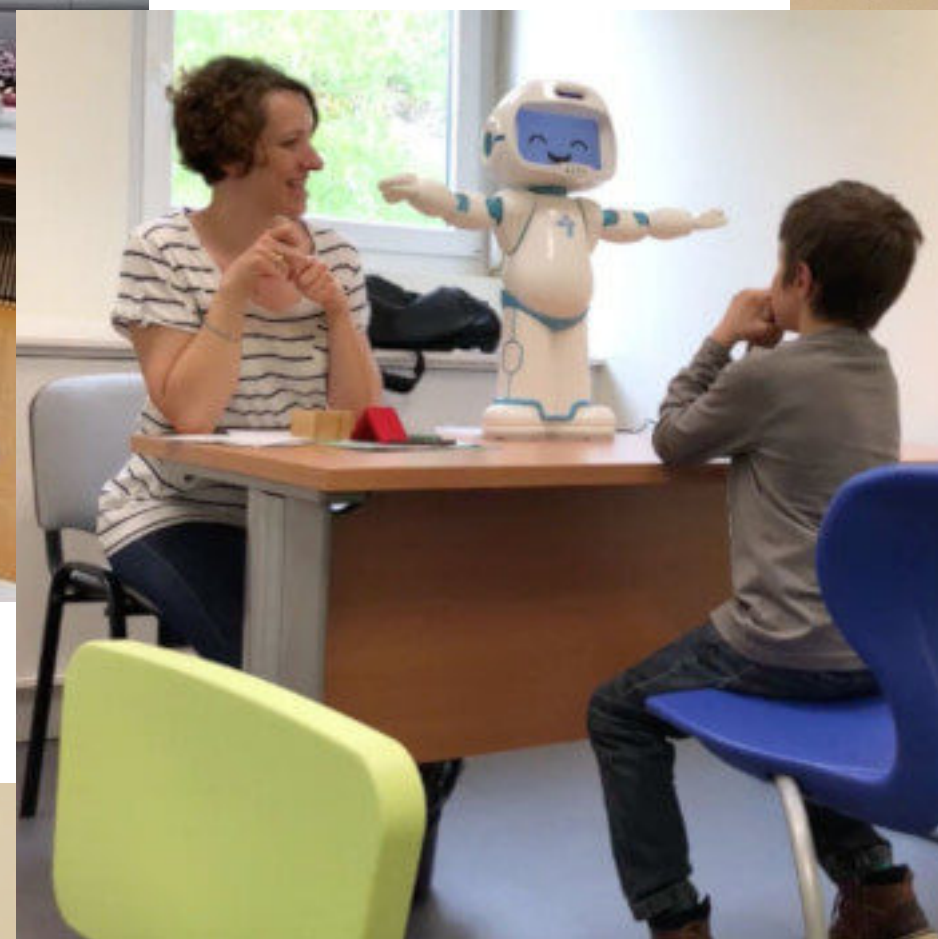
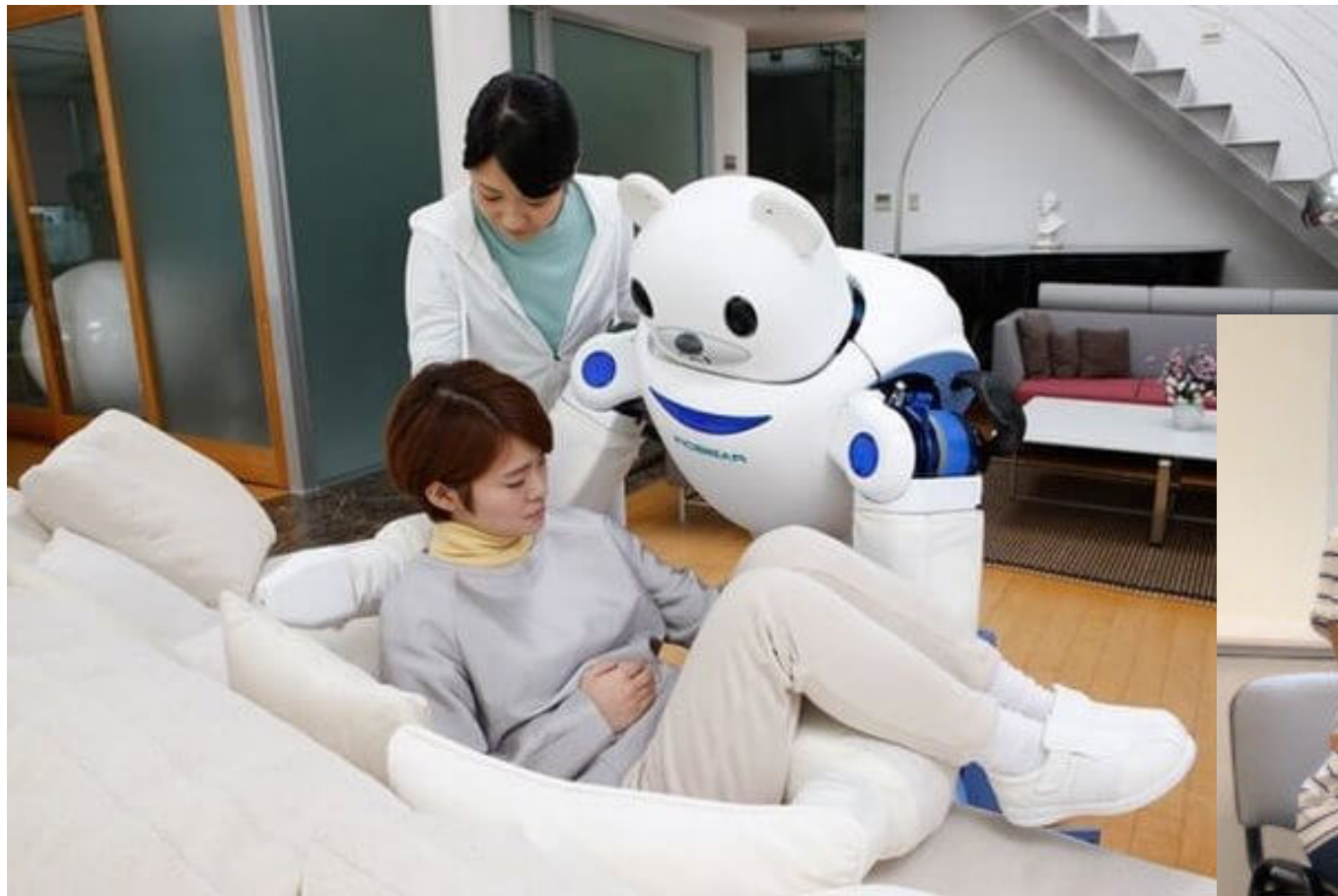
What is my research mission?

How do we develop
social robots?
*Do robots need
social behaviours!?*

What is my research mission?

**How can we develop
social behaviours for
robotic collaborators?**

What is my research mission?



Past Research

Past Research

PhD (2017-2021)

Past Research

How can we develop
**social behaviours for
robotic teammates?**

Robotic Collaborator

Robotic Teammate

Past Research

**What personalities
do people prefer
for a robotic teammate?**

Past Research

Do people mind if a
robotic teammate
has selfish actions?

Past Research

Can a **robotic teammate**
express group-based
emotions?

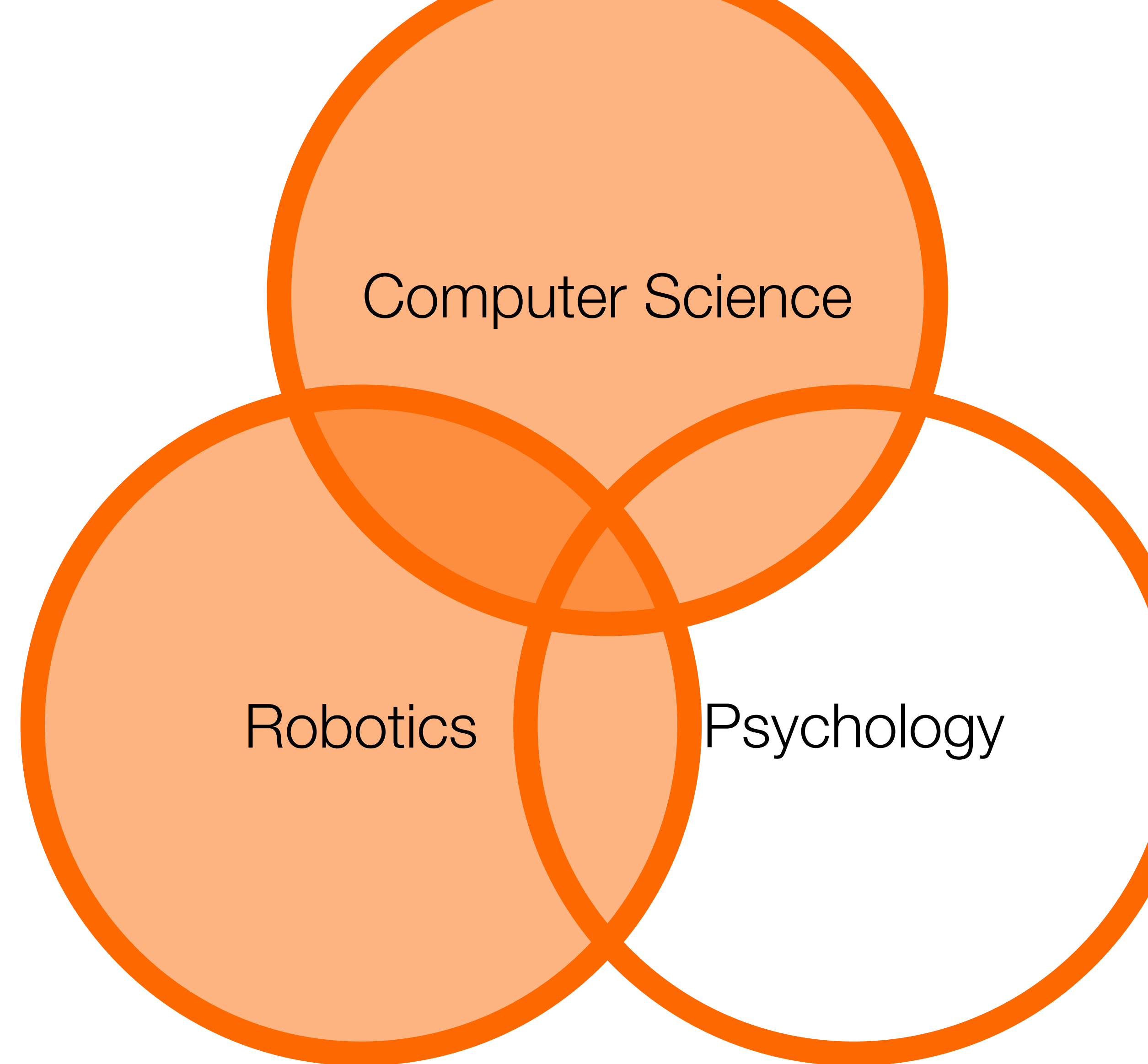
Past Research

**Can the gaze cues of a
robotic teammate
impact the teamwork?**

Past Research

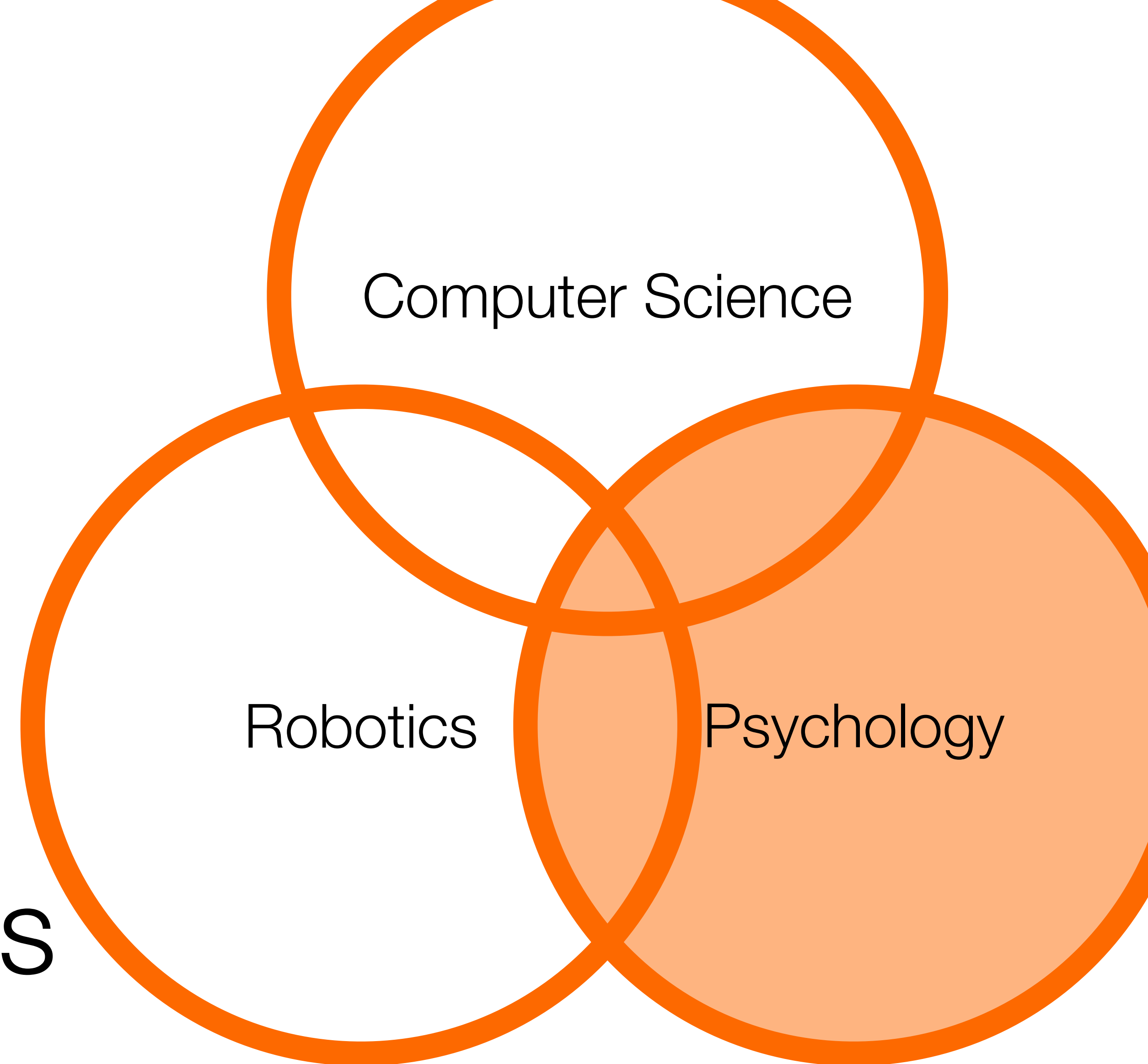
Contributions:

1. Development of autonomous social behaviour



Past Research

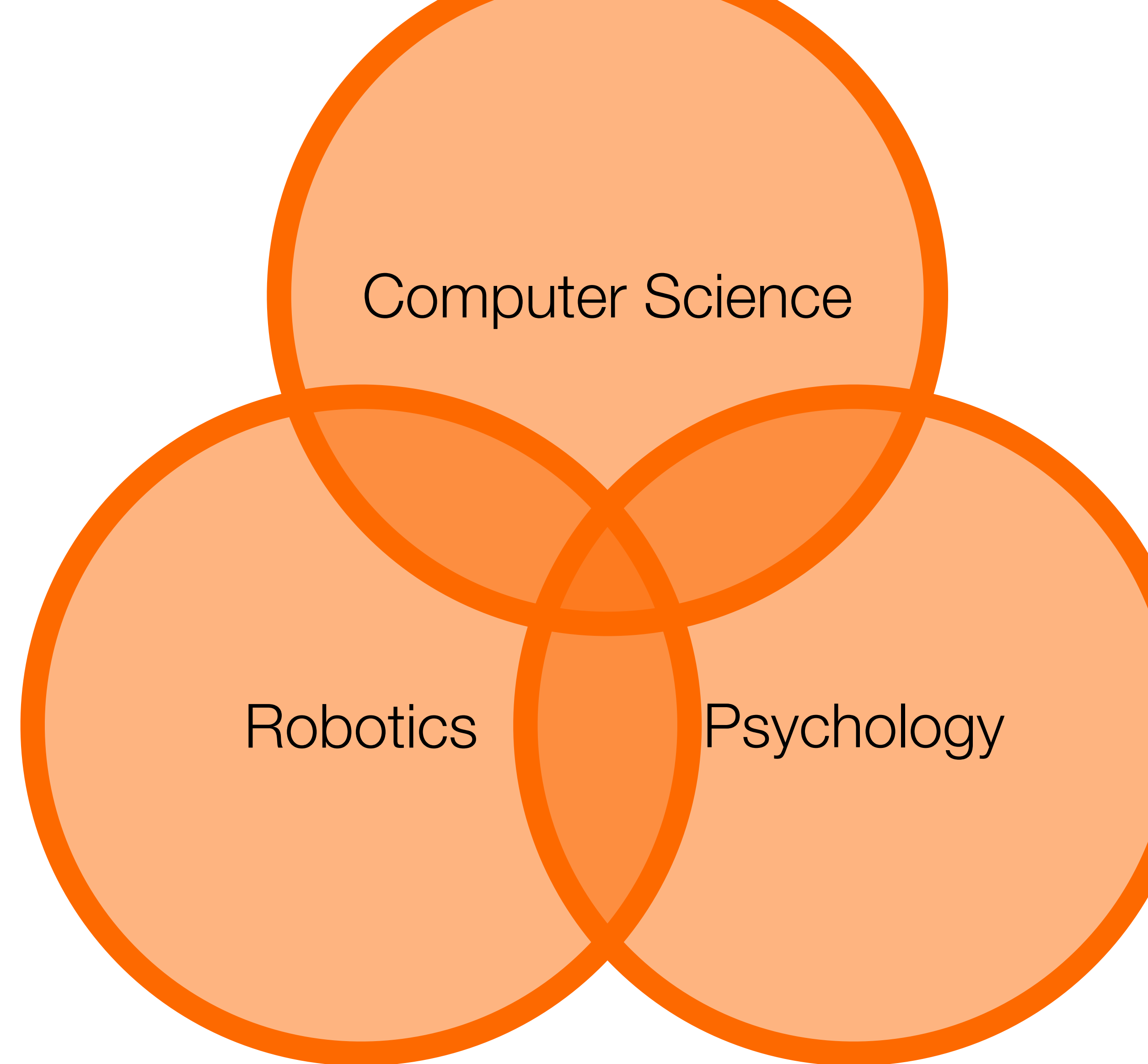
Contributions:
2. Evaluation of
people's perceptions



Past Research

Contributions:

3. Understanding
human-robot
teamwork



Future Research

Future Research

Group Dynamics in Human-Robot Collaboration

Future Research

Group Dynamics

Robots need:

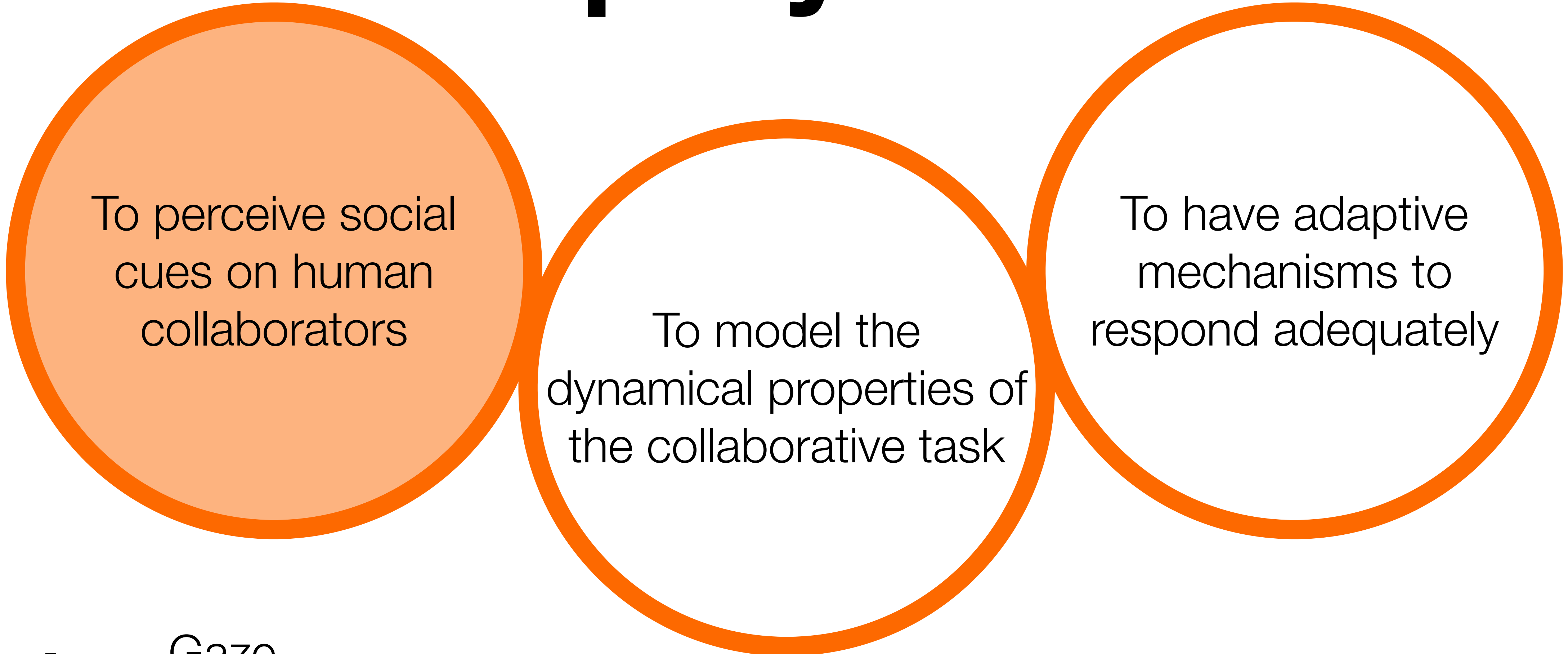


To perceive social cues on human collaborators

To model the dynamical properties of the collaborative task

To have adaptive mechanisms to respond adequately

Group Dynamics



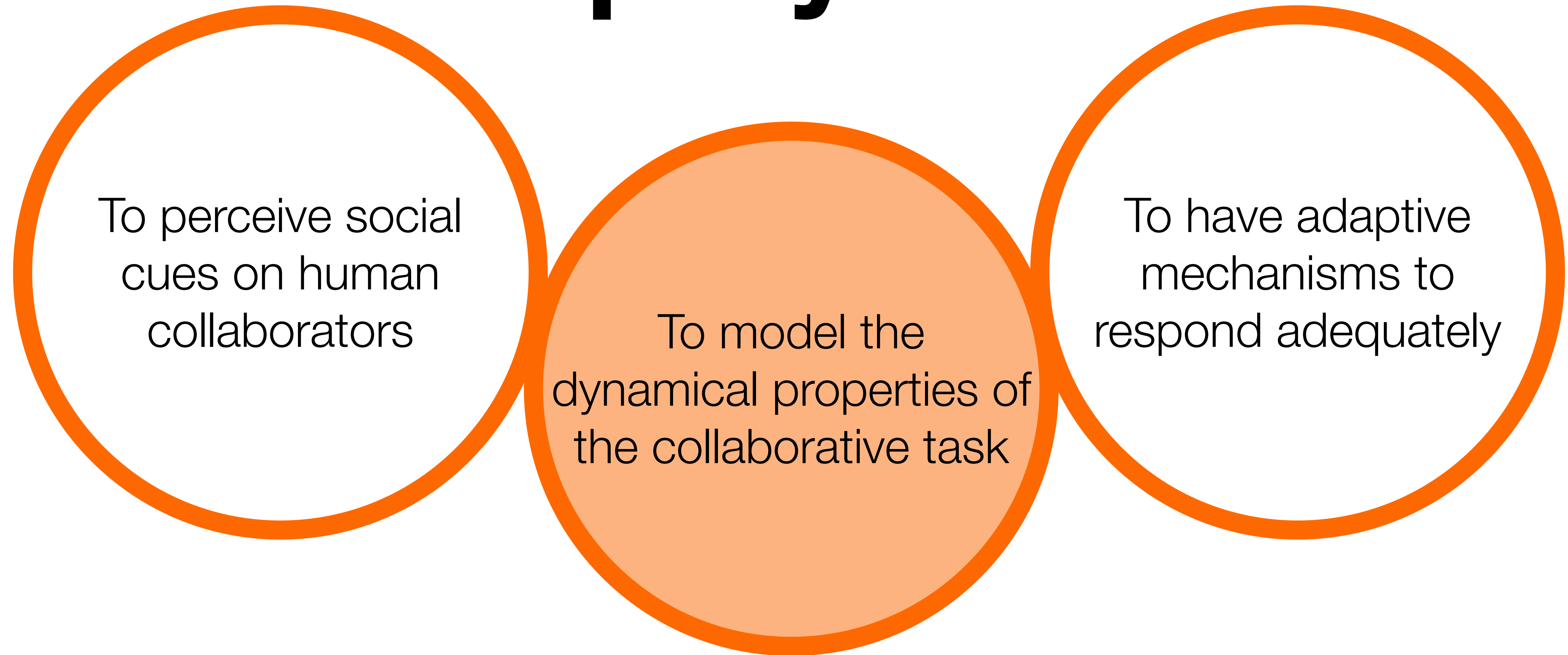
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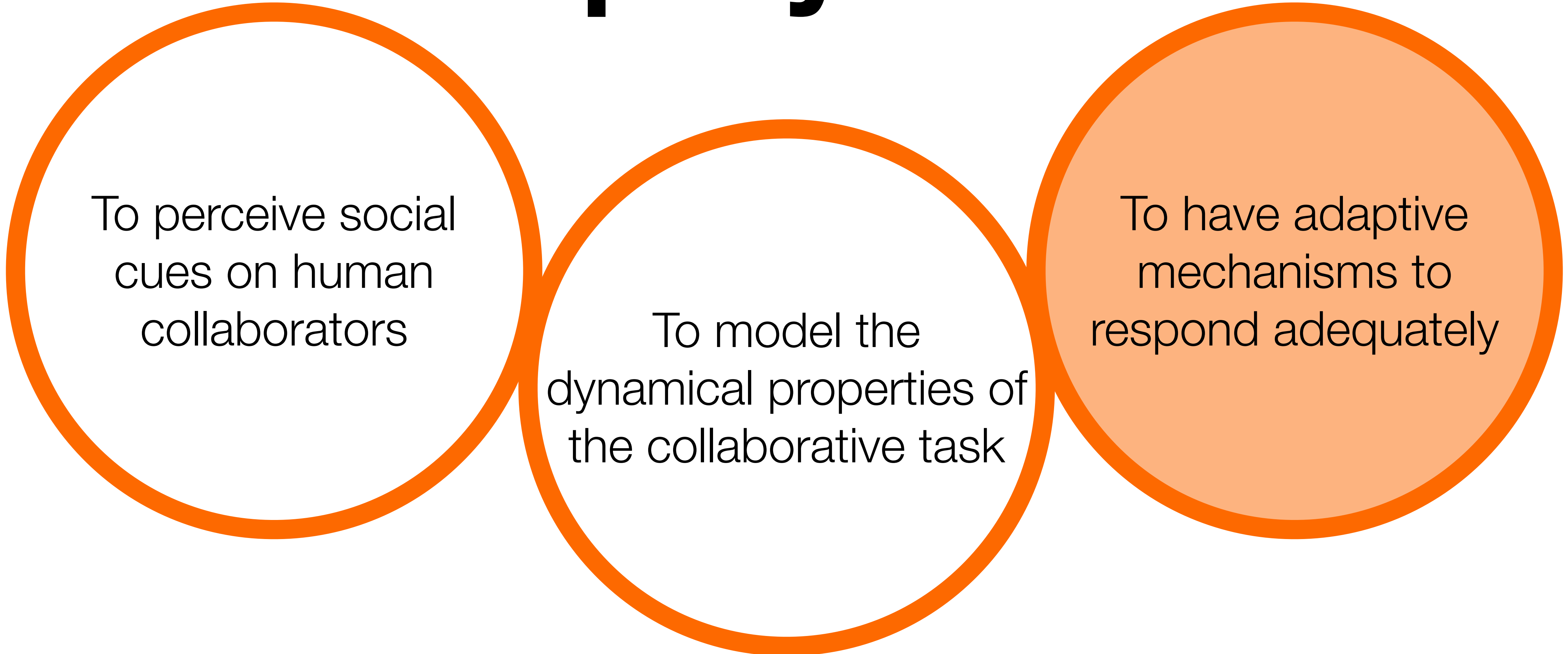
- Gaze
- Attention
- Participation

Group Dynamics



- Real-time measures of collaboration (e.g. cohesion, satisfaction, fluency)

Group Dynamics



To perceive social cues on human collaborators

To model the dynamical properties of the collaborative task

To have adaptive mechanisms to respond adequately

- Social Network Analysis (e.g. sociometry)

Research Mission

How can we develop social behaviours for robotic collaborators?

Future Research (short-medium term)

How can we develop social behaviours for robotic collaborators?

Group Dynamics in
Human-Robot Collaboration!

Future Research (medium-long term)

design and



How can we develop social
behaviours for robotic collaborators?

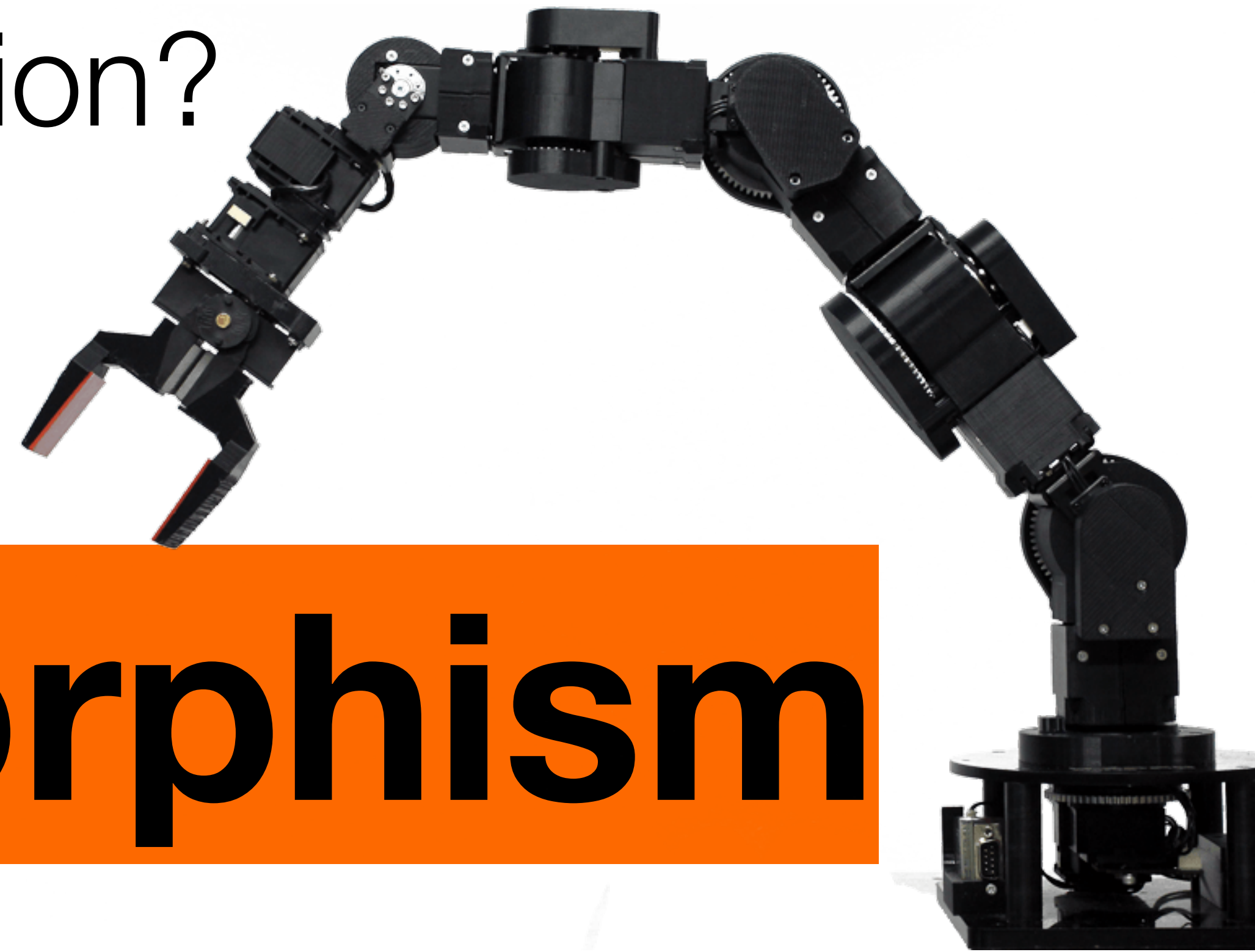
Future Research (medium-long term)

How can we **design** and develop social behaviours for robotic collaborators?

- **Anthropomorphism**
 - **Agency**

Future Research (medium-long term)

Can the behaviours of a non-humanoid robot be considered as anthropomorphic?
Does that facilitate collaboration?



- **Anthropomorphism**

Future Research (medium-long term)

How humanlike should robots be in terms of shape and behaviours?

- **Anthropomorphism**

Future Research (medium-long term)

How should robots act in collaborative-control scenarios (i.e. semi-autonomous or mixed-agency)?

- **Agency**

LARSys

Compatibility

LARSysS Compatibility

Human-Robot
Collaboration

INTERACTION

LIFE

LARSysS Compatibility

Human-Robot
Collaboration

INTERACTION

LIFE

AIR

OCEANS

URBAN

Potential Funding

Potential Funding

2021

2022

2023

- Group Dynamics

FCT Scientific
Employment
Stimulus

FCT R&D
Projects

- Anthropomorphism

Branco Weiss
Fellowship

- Agency

Jacobs
Foundation
Fellowship

ERC

Potential Colaborators

Robotics:

- Malte Jung, Cornell University - USA
- Ginevra Castellano, Uppsala University - Sweden
- Catharine Oertel, TU Delft - The Netherlands
- Sarah Sebo, University of Chicago - USA

Psychology:

- Astrid Rosenthal-von der Pütten, RWTH Aachen University - Germany
- Marlena R. Fraune, New Mexico State University - USA
- Patrícia Arriaga, ISCTE - Portugal
- Pedro Marques-Quinteiro, ISPA - Portugal

International Recognition

H-R Teamwork

H-R Group Interactions

- book chapters
- journal papers
- top-tier conferences
- invitation-only Dagstuhl workshop



RSS
IROS
HRI
AAMAS
ASSETS
CSCW

Thank you!