# Automated Agents that Interact Proficiently with People

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Intelligent Agent, Interaction & Modelling Lab

European Research Council
erc

# Automated Agents

- Autonomous
- Plan
- Adaptive
- Able to learn
- Cooperate with other agents or people
- Can face adversary

# Support People

Climate Control
28 C°
AUTO
Fan Only
ECO
Comfort
AUTO
AUTO
20 °
ON
OFF

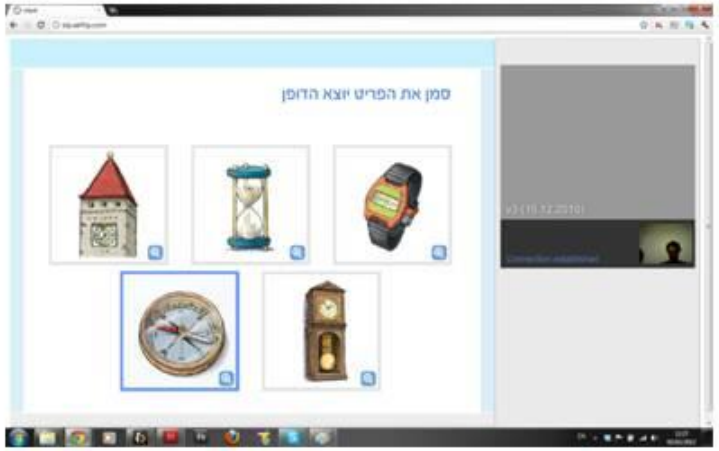
SUBJECT
TO
SEARCH
SPEED
LIMIT
25
SOUTH
To
105

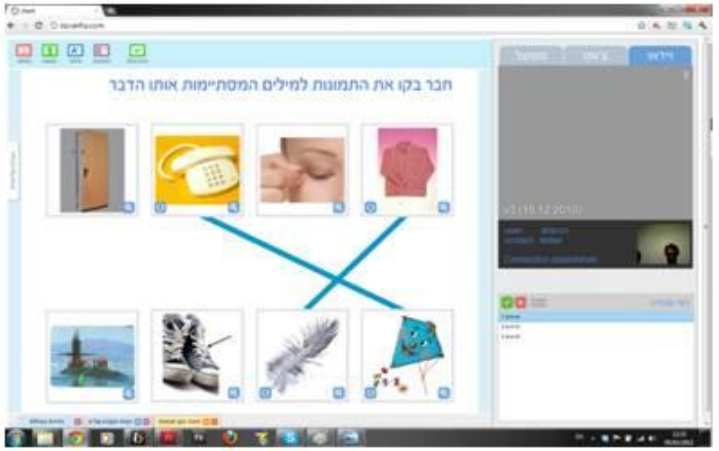
# Replace People

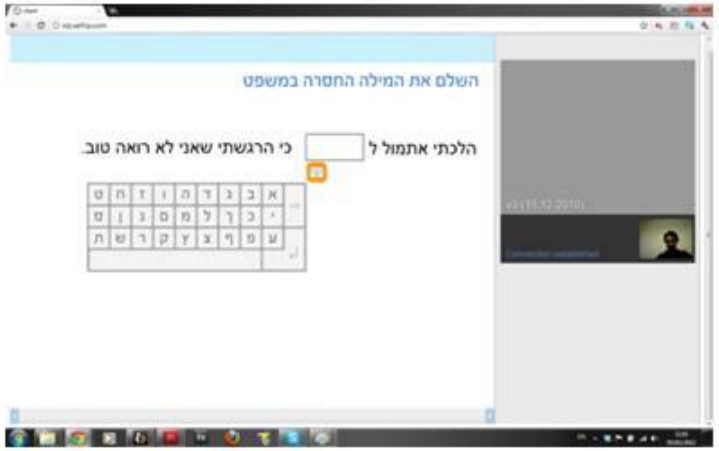
Free
החופש לנשנש
69
קלוריות ליחידה
חטיף דגנים תמרים וקינמון
ללא חומרים משמרים
ללא גלוטן
מכיל 40% דגנים בתוספת סיבים תזונתיים
ללא צבעי מאכל
ללא תוספת סוכר
5 חטיפים 110 גרם

# Language Tele-Rehabilitation

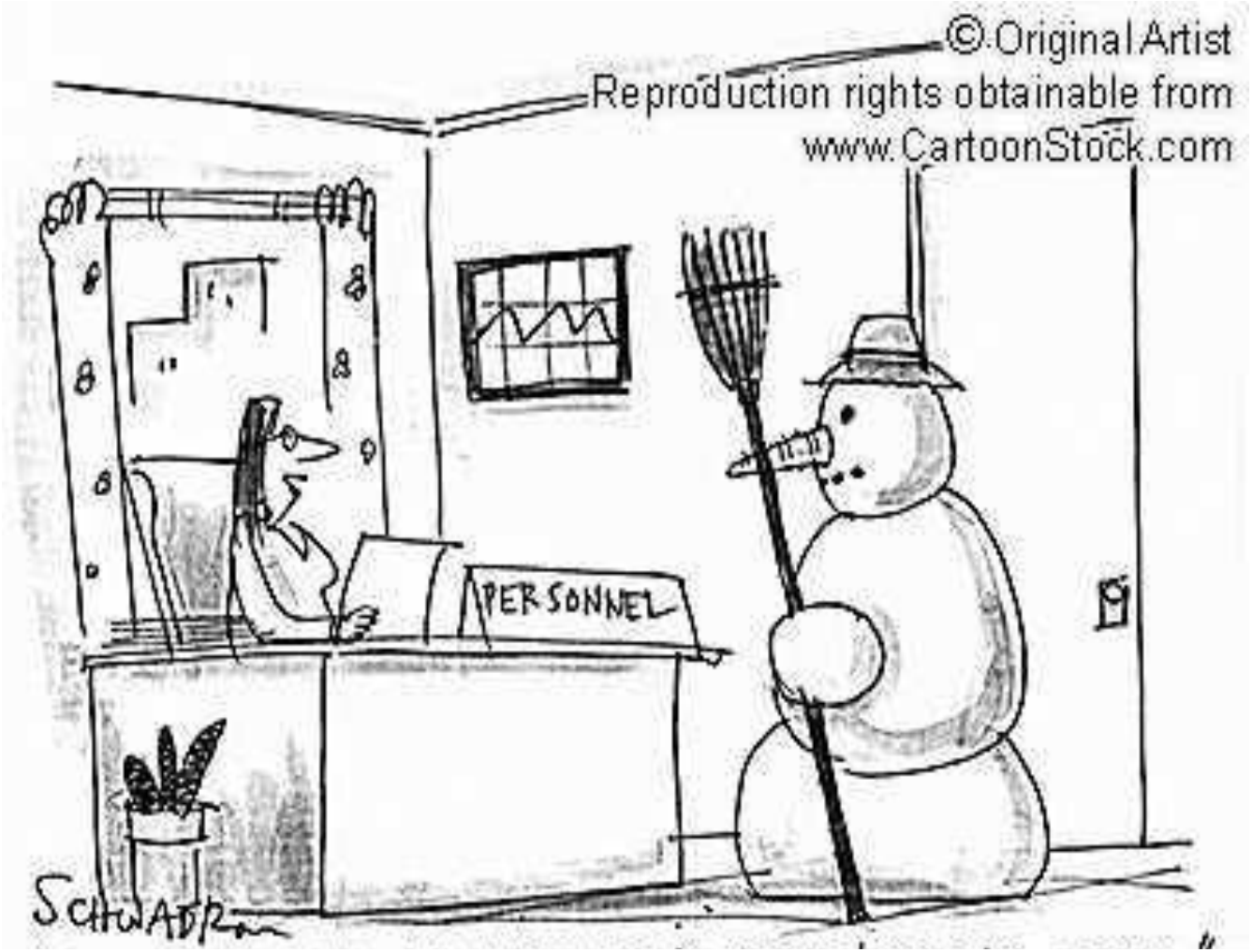
## Speech therapy based activities for aphasia



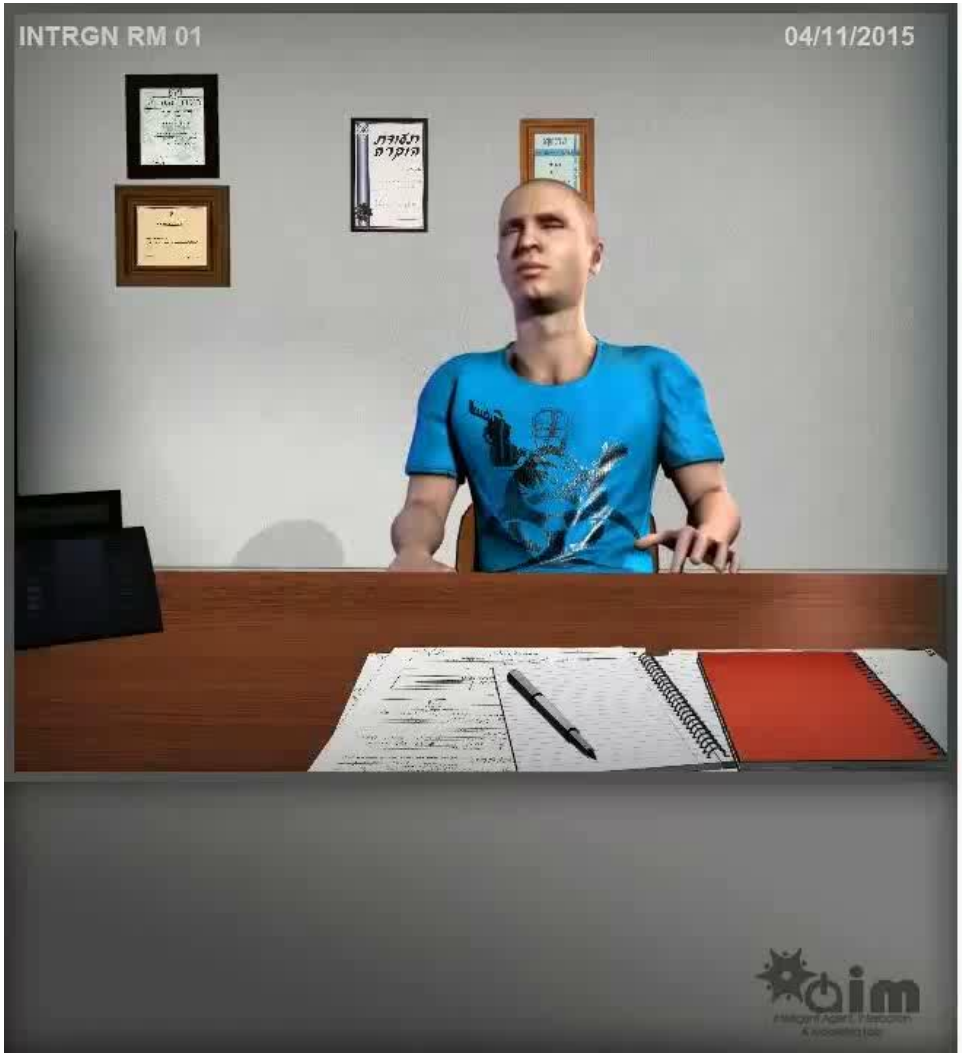



# Train People




"You must be the one inquiring about the 'TEMP' position…"




Training

Step 4

## חדר חקירות

שרתך היגד

השאלה הנבחרת תופיע כאן

Finish

Send

1 אתה חשוד ב{action} ב{date} ב{location}.

2 אין אתה חייב לומר דבר. כל שתאמר עשוי לשמש ראיה נגדך. הימנעות מלהשיב לשאלות עשויה לחזק את הראיות נגדך.

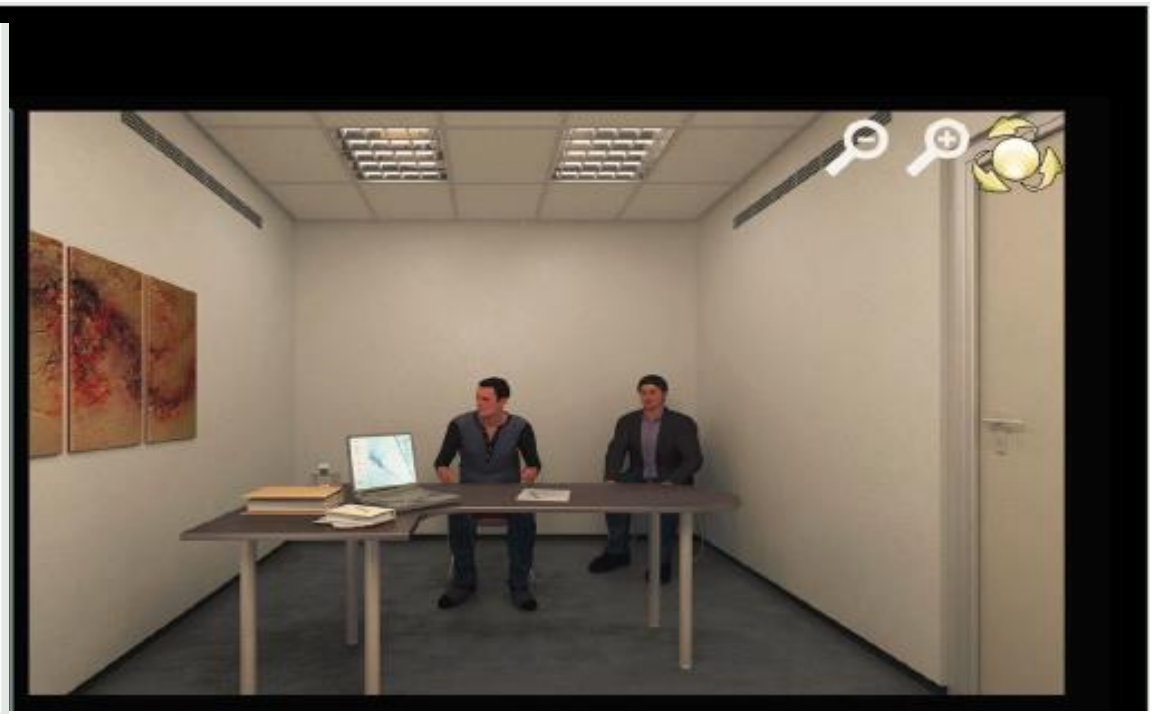
3 הנך רשאי להתייעץ עם עורך דין בטרם גביית העדות.

4 מה שלומך?

6 מה השם שלך

# Virtual Interrogation Game

LAW-TRAIN

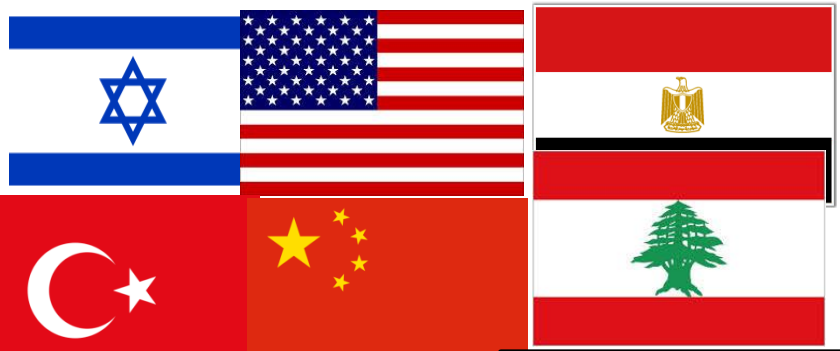


# Computerized Agents that Interact with People

Persuading people to save energy

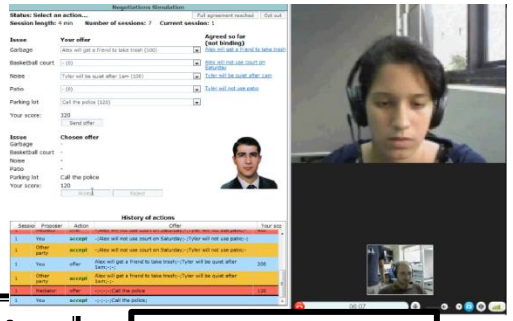
Training people in negotiations

Intelligent randomization for Physical Security



Culture sensitive negotiation agent

Agent supports Argumentation



Automated Speech Therapist

Automated mediators

# Common to all Settings

**Predicting user's behavior is necessary**

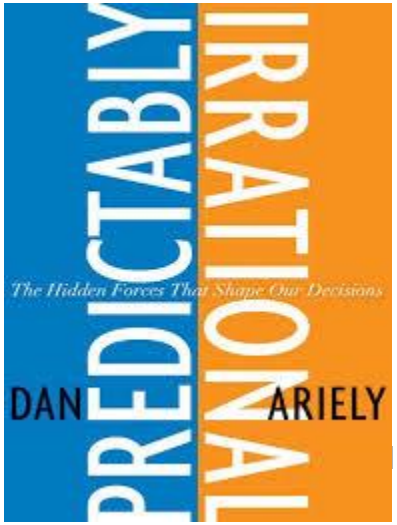
Allows the agent to choose its best actions

# People Often Follow Suboptimal Decision Strategies

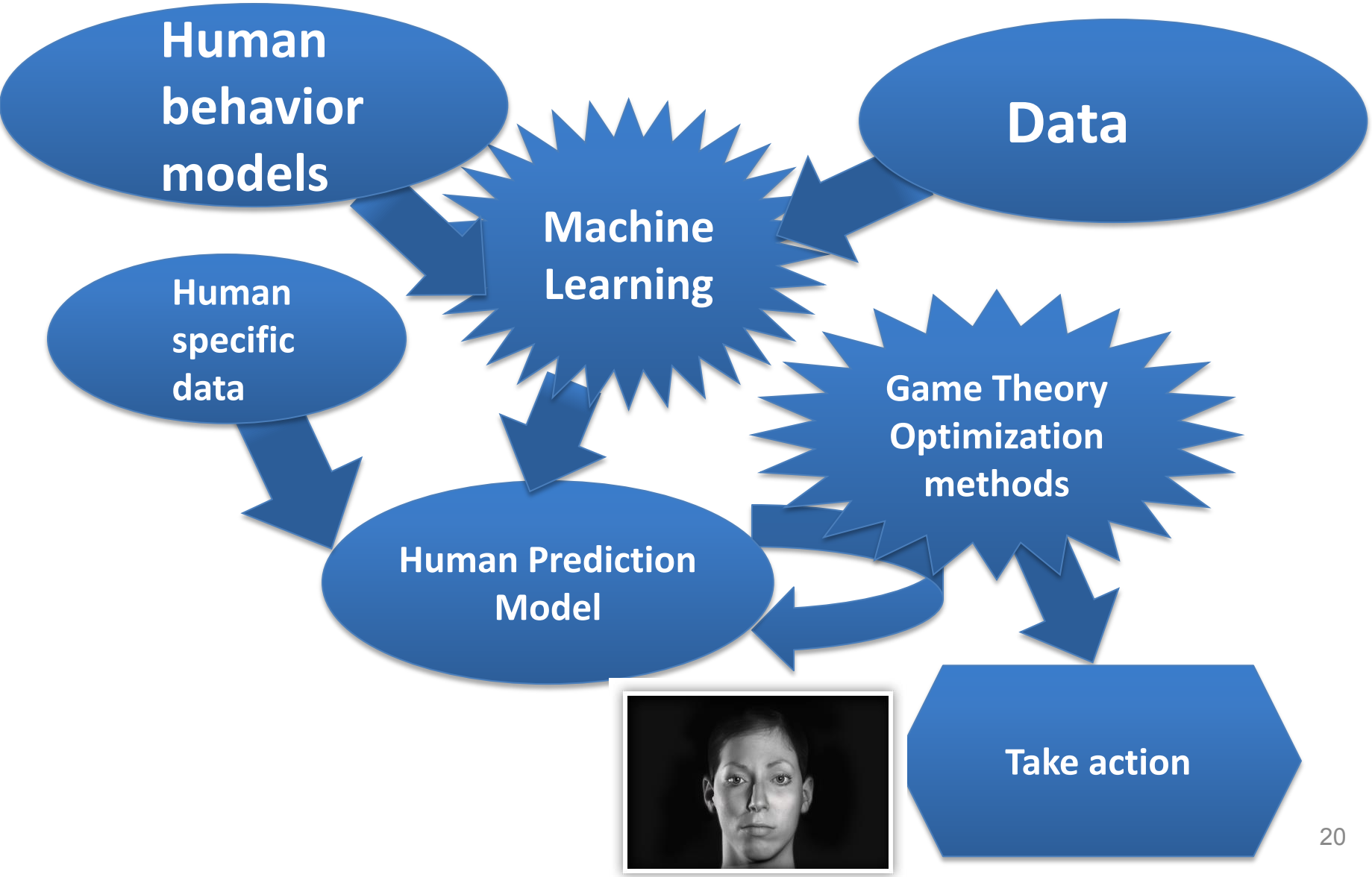
- Irrationalities attributed to
  - sensitivity to context
  - lack of knowledge of own preferences
  - the effects of complexity
  - the interplay between emotion and cognition
  - the problem of self control
-

Selten

Kahneman



# Methodology



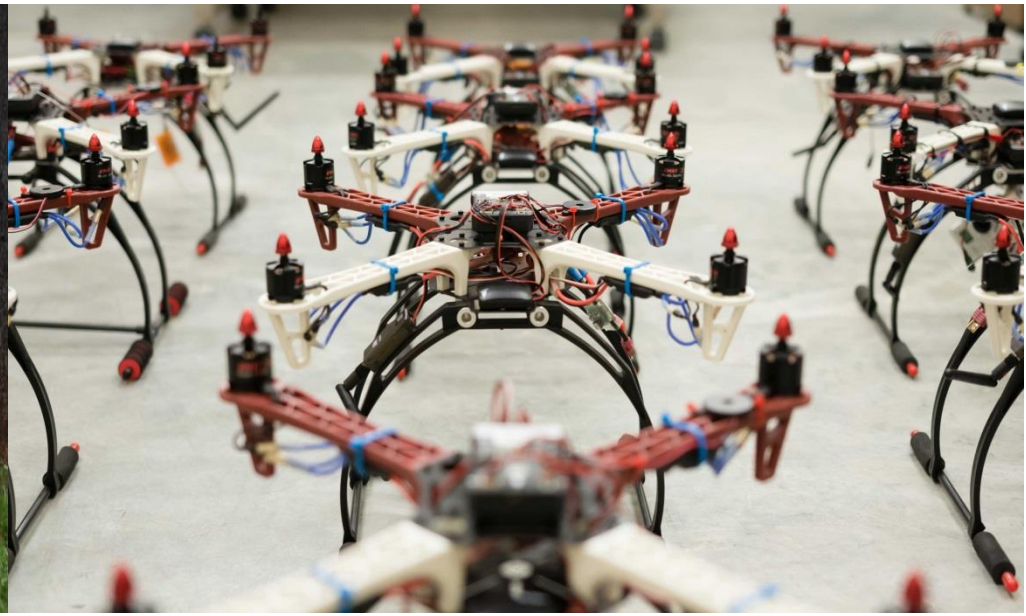
# Intelligent Agent Supporting Human-Multi-Robot Team Collaboration

Ariel Rosenfeld , Noa Agmon,
Oleg Maksimov, Amos Azaria,
Sarit Kraus

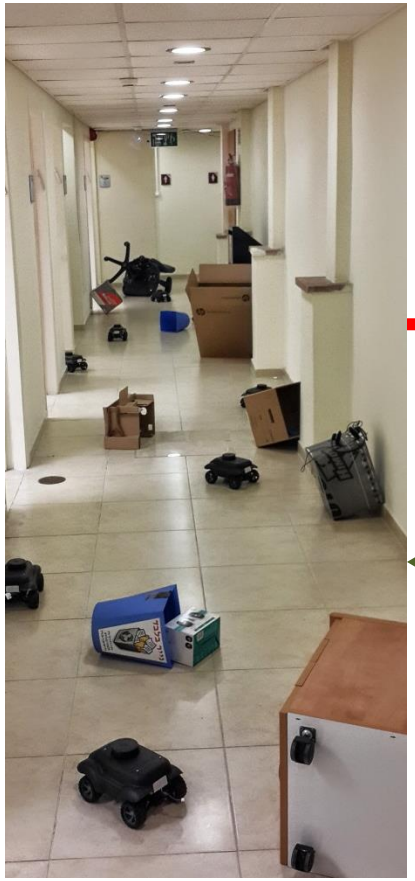
Tradition of Excellence
Bar-Ilan University

European Research Council
erc

U.S. AIR FORCE

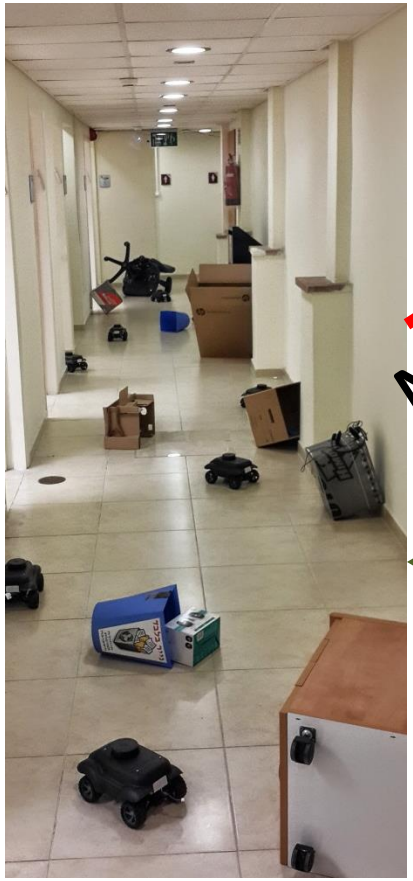


# Semi-Autonomous Robots



**Noisy signals**

**Controls the robots**

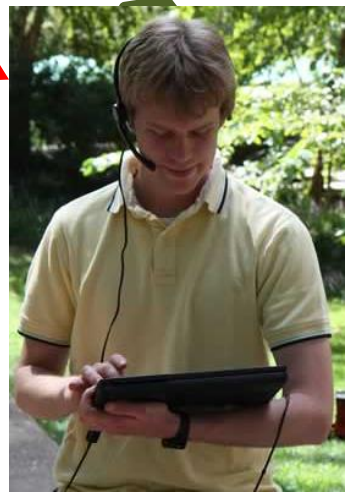


Agent

Prioritize tasks
Provide warnings

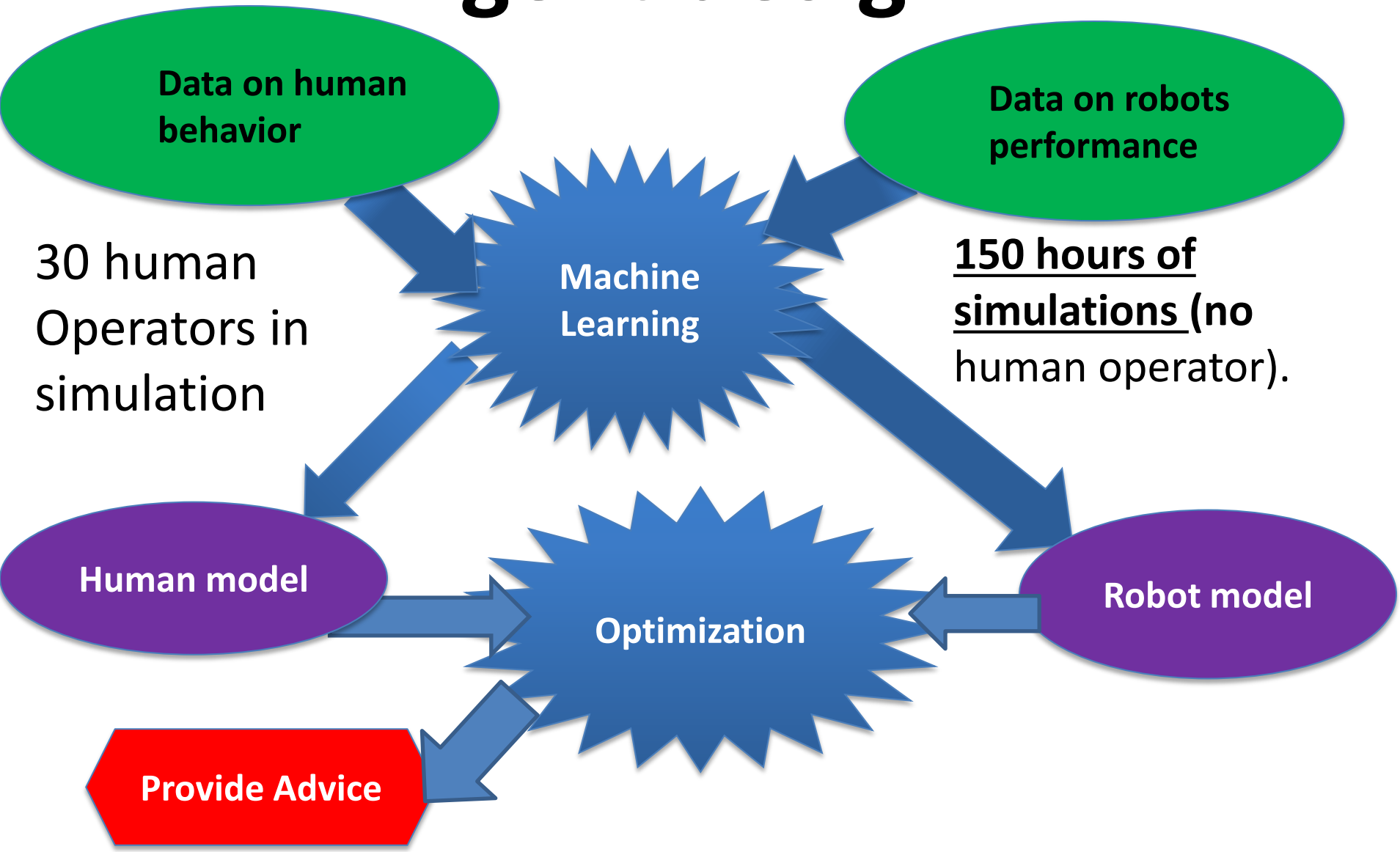
Noisy signals

Filtered signals



Controls the robots

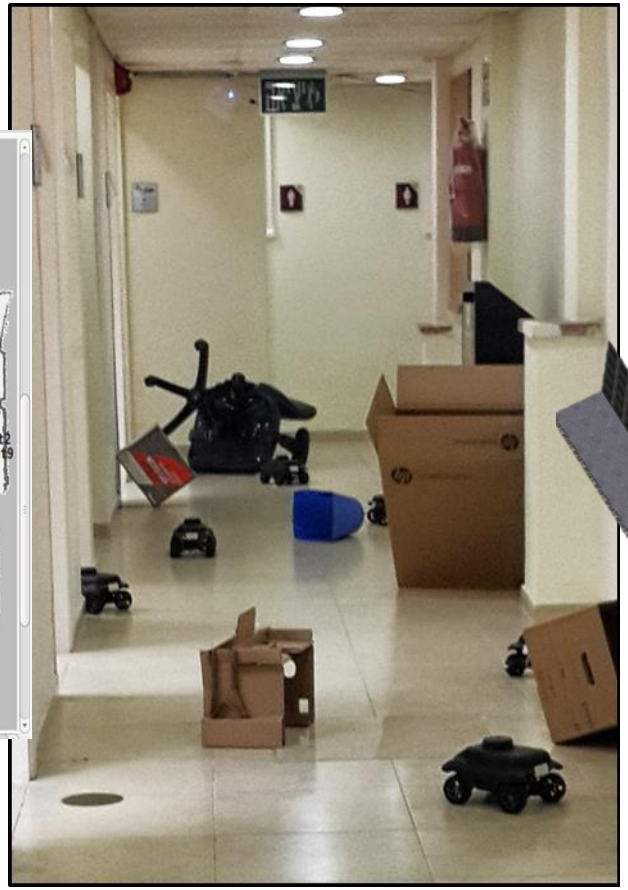
# Agent design



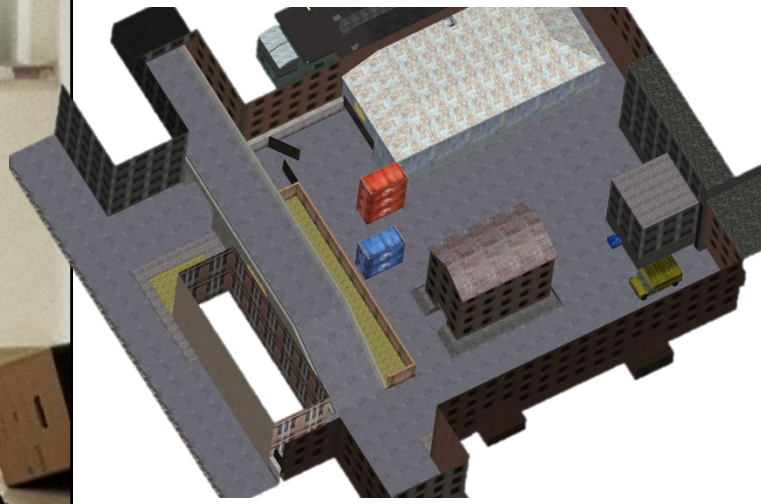
# Evaluation: Three Environments

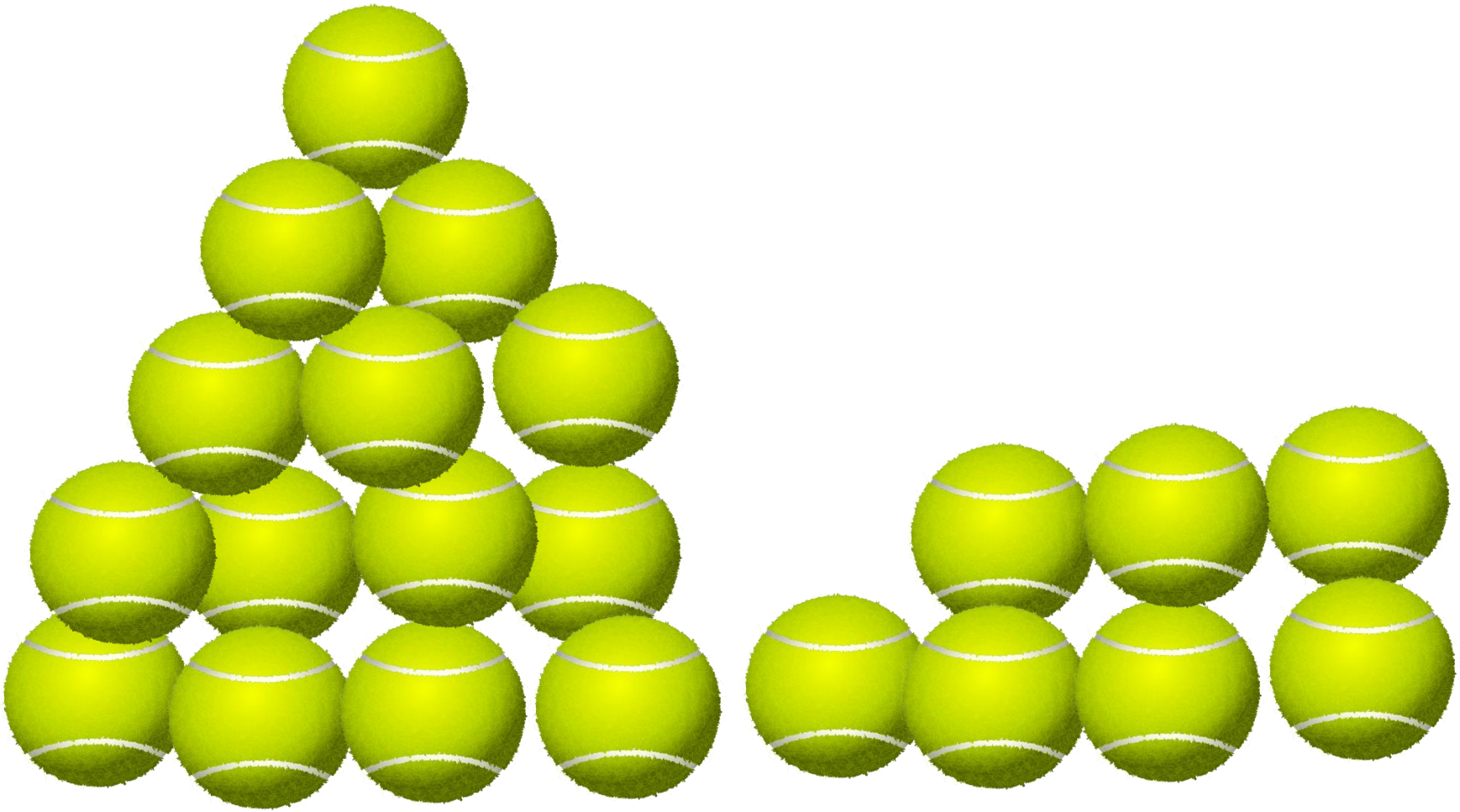
16 subjects

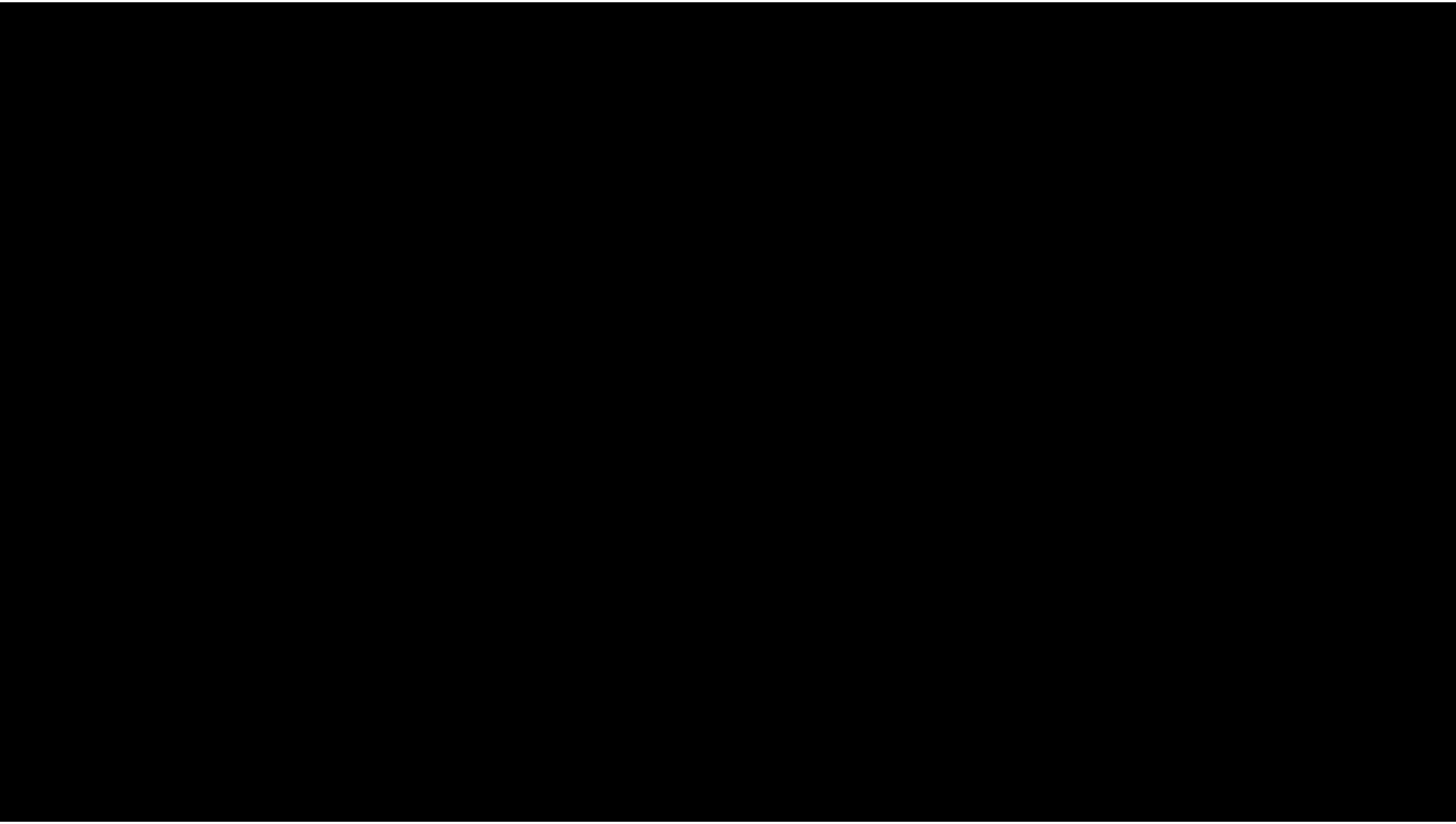
12 subjects

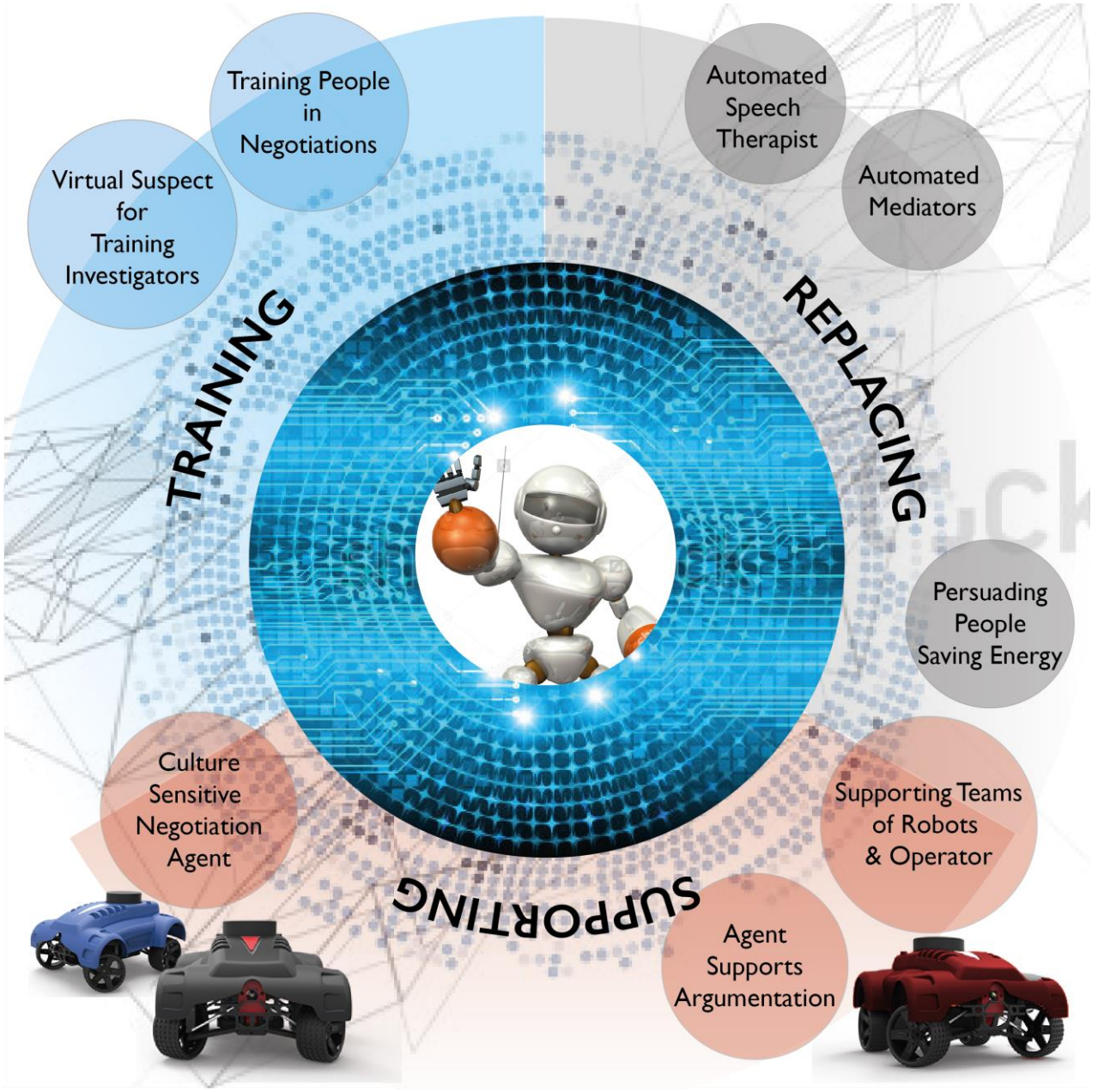


16 subjects








Training People in Negotiations
Virtual Suspect for Training Investigators
TRAINING
Automated Speech Therapist
Automated Mediators
REPLACING
Persuading People Saving Energy
Culture Sensitive Negotiation Agent
SUPPORTING
Supporting Teams of Robots & Operator
Agent Supports Argumentation