Coding and digital workshop

Duration	2 hours	Mode	Physical
Nr. of Facilitator(s)	2	Nr. of Participants	23

Session objectives	To be able to program Damerino, an educational social robot capable of expressing emotions, speaking and listening and being programmed to interact with users, expressing emotions, speaking, listening, giving advice, helping, …
Room requirements	One big room
Supplies and equipment	Computers (1 for each group), projector/Smartboard, pencils, paper
Materials	Powerpoint presentation: Coding and digital workshop

Description

Include Instructions facilitators, step by step description, time schedule

Duration	Instructions
10 min	Introduction - Robots: definition and kind of robots

20 min	Social robots
	    - meaning, examples
	    - what is essential for a social robot to work well with humans?
	Decision Tree VS Natural Language Processing

1 hour	Activity: - Form 5 groups - Try and imagine a scenario for a social robot - Write out a possible decision tree for your robot - Program your Demerino according to your decision tree
25 min	Trying out different things on the social robot: - Facial expressions - Question & Answer (casual access to answer) - Say and listen (sequential access to answer; repeat)
5 min	Final restitution

Coding and digital workshop

Robots: some definitions

A robot is a machine—especially one programmable by a computer—capable of carrying out a complex series of actions automatically.

They're divided in
Industrial robot and Service robot

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Industrial robots

Used for automating precise and repetitive manufacturing processes. They commonly automate jobs that are undesirable or unsafe for humans.

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Service robot

Service robots are considered to be any robot used outside of manufacturing. They can be used in both domestic and commercial settings.

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Service robot

Unlike industrial robots, service robots are not designed to replace humans. Instead they are designed to help humans or perform tasks for humans.

The design of service robots varies considerably and depends upon their use. Some consist of small circular machines, while other may resemble a touchscreen on wheels, and other may resemble small motorized vehicles.

Social robot

A social robot is an autonomous robot that interacts and communicates with humans or other autonomous physical agents by following social behaviors and rules attached to its role.

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Social robot

Like other robots, a social robot is physically embodied (avatars or on-screen synthetic social characters are not embodied and thus distinct).

Some synthetic social agents are designed with a screen to represent the head or 'face' to dynamically communicate with users.

In these cases, the status as a social robot depends on the form of the 'body' of the social agent; if the body has and uses some physical motors and sensor abilities, then the system could be considered a robot.

Social robot

Henn na ("Weird") hotel

in Japan

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Social robot

Clerk robot

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Social robot

Amy waitress

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Social robot

Amy waitress, in Italy

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Social robot

Amy waitress, in Italy

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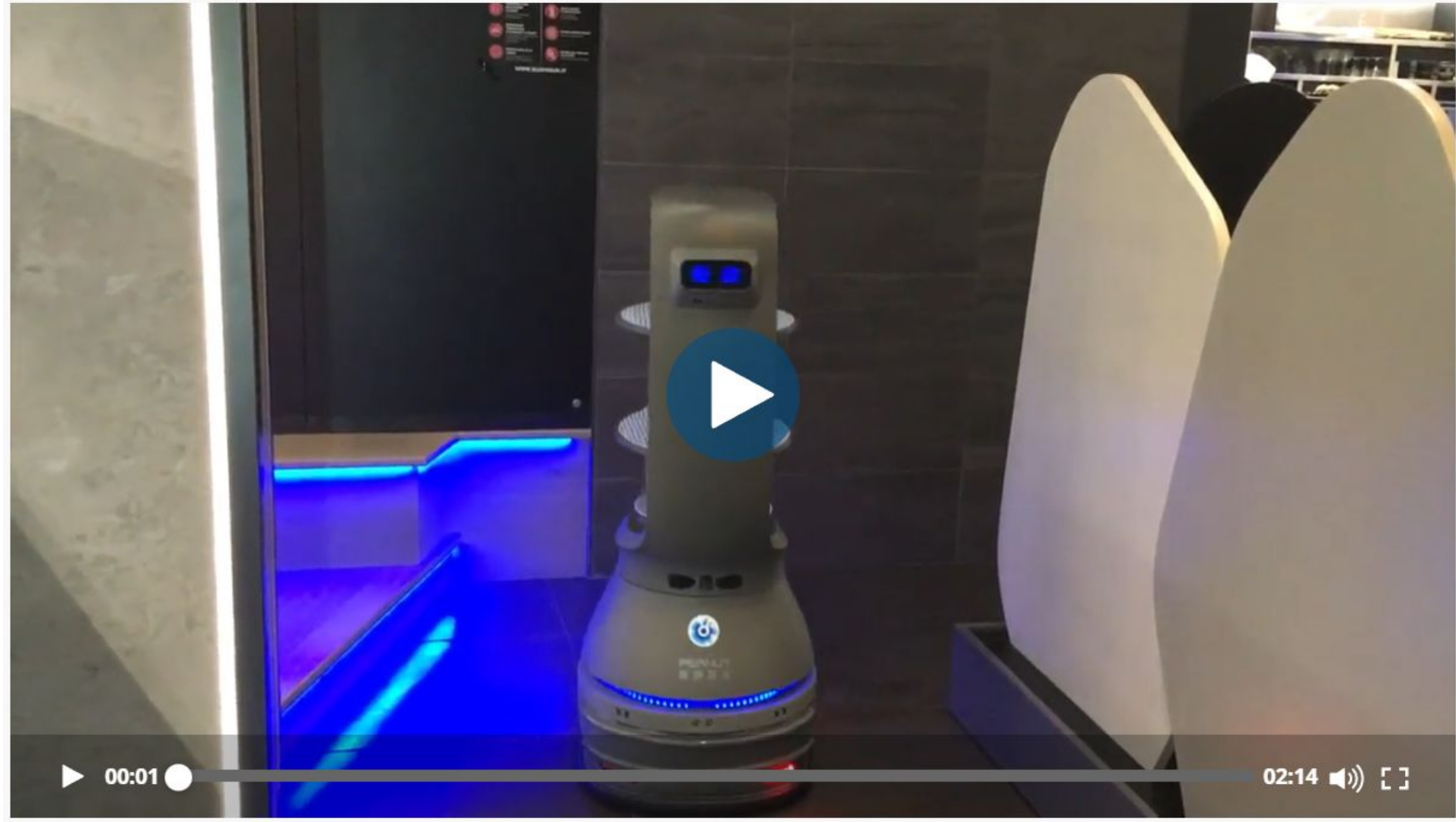
MecWilly

Social robot

Personalised machine learning helps human-like robots interact with autistic children during therapy

Automated Measurement of Engagement Level of Children with Autism Spectrum Conditions during Human-robot Interaction

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What do you think is essential for a social robot to work well with humans?

It must understand what you say

It must "hear" well

It must infer the meaning of what you are saying/asking

It must be able to respond

Good signal to noise ratio

Natural-language understanding

Verbal (GPT-3) and Non verbal communication

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Decision Tree Vs Natural Language Processing

DECISION TREE CHATBOT	FEATURE	NATURAL LANGUAGE PROCESSING CHATBOT
Keyword-driven	FUNCTIONALITY	Context-driven
Acts on manually created rules	MECHANISM	Training from quality data
Quick to setup	EASE OF SETUP	Longer setup
Harder to scale as bots get complex	SCALABILITY	Easier to scale with as it learns continuously from user interaction
Lower, especially for simpler bots	COST	Higher
Requires human intervention for logical tweaks	RESOURCE EFFICIENCY	Requires heavy and quality initial training but easier to maintain in long run without human intervention
Less personalized experience	PERSONALIZED EXPERIENCE	More personalized experience

Let's try it!

- form 5 groups
- try and imagine a scenario for a social robot
- write out a possible decision tree for your robot
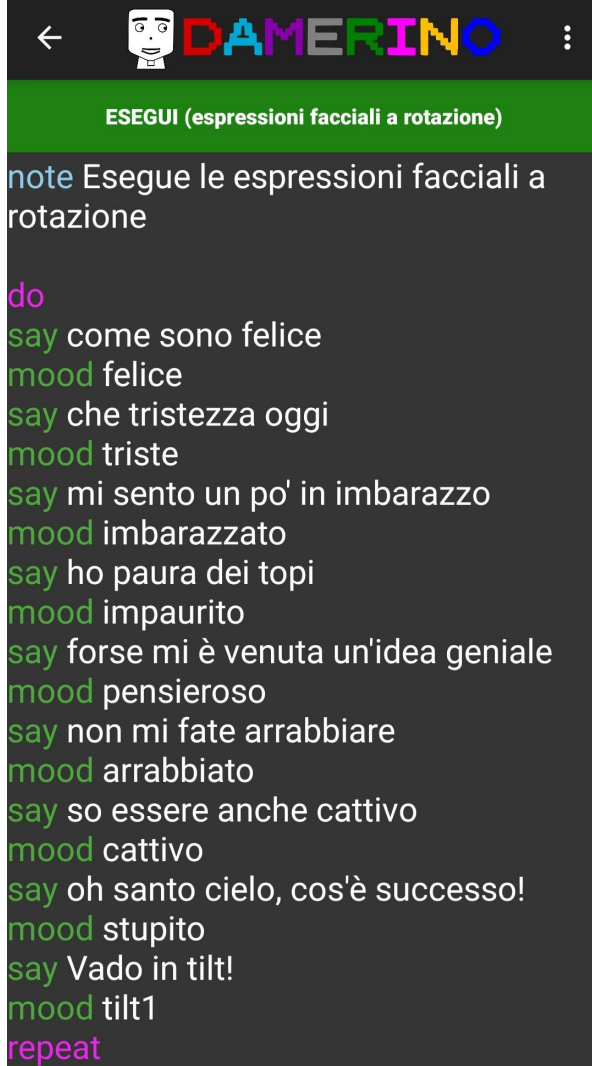- program your Damerino according to your decision tree

Let's try it!

Let's try one of the examples:
facial expressions

Resources

Guida per l'utente

ESEGUI (espressioni facciali a rotazione)

note Esegue le espressioni facciali a rotazione

do
say come sono felice
mood felice
say che tristezza oggi
mood triste
say mi sento un po' in imbarazzo
mood imbarazzato
say ho paura dei topi
mood impaurito
say forse mi è venuta un'idea geniale
mood pensieroso
say non mi fate arrabbiare
mood arrabbiato
say so essere anche cattivo
mood cattivo
say oh santo cielo, cos'è successo!
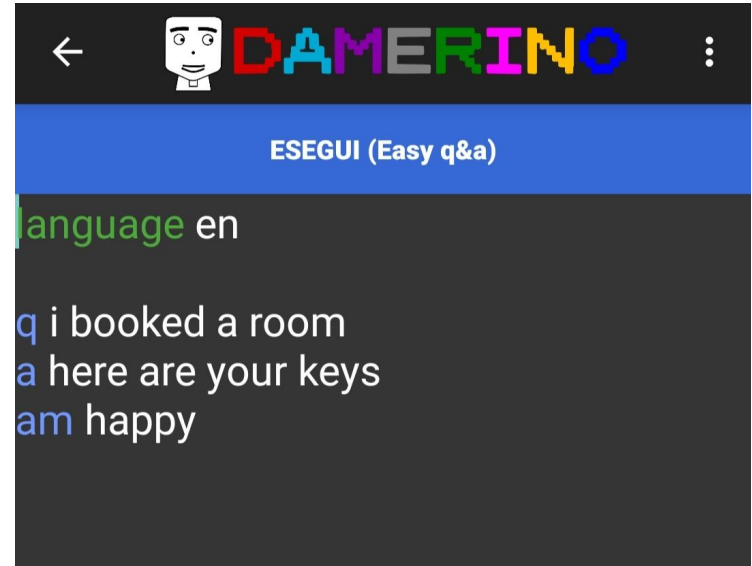mood stupito
say Vado in tilt!
mood tilt1
repeat

Let's try it!

Question & Answer
Casual access to answer
(you can't do dialogue)

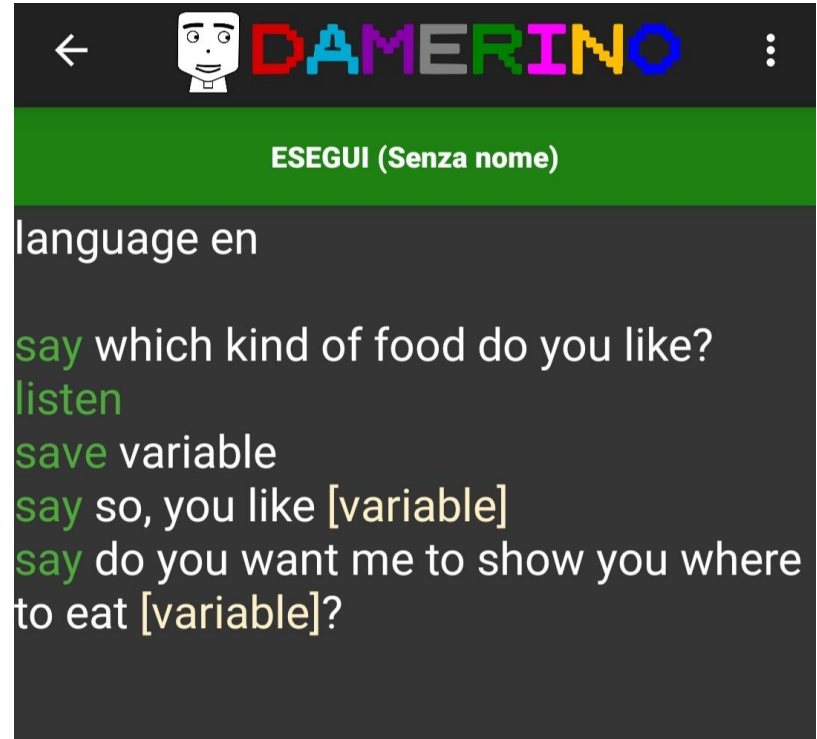q i booked a room
a here are you keys
am happy

Let's try it!

Say & Listen
Sequential access to answer

"listen" makes Damerino listen for a few seconds
"say" makes it speak
you can store a word or phrase in a variable by declaring it
with the keyword "save" and recall it using [ ]

← 🧑 DAMERINO ⋮

ESEGUI (Senza nome)

language en

say which kind of food do you like?
listen
save variable
say so, you like [variable]
say do you want me to show you where
to eat [variable]?

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Let's try it!

**Say & Listen
and you can repeat**

open your program with the keyword "do"
and close with "repeat"

ESEGUI (ripete quello che dici)

```
do
listen
save x
say [x]
repeat
```

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Thank you

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