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1. Introduction

- Entertainment is an important aspect of a social robot
- Robot as a communication platform
- Cognitively stimulating games

Goals

- Implement computer game with multiple interaction channels
- Speech control
- Human-like gaze behaviour

2. Robotic Platform ALIAS

- ALIAS: Adaptable Ambient Living Assistant
- AAL-JP project ALIAS [1]
- Mobile robot system
- Communication platform for elderly people
- First experiments with elderly users [2]

Functionalities

- Ground lighting & guidance at night
- Telephone
- Gaming
- Alarm Call
- Remote control
- Net-based services

Hardware

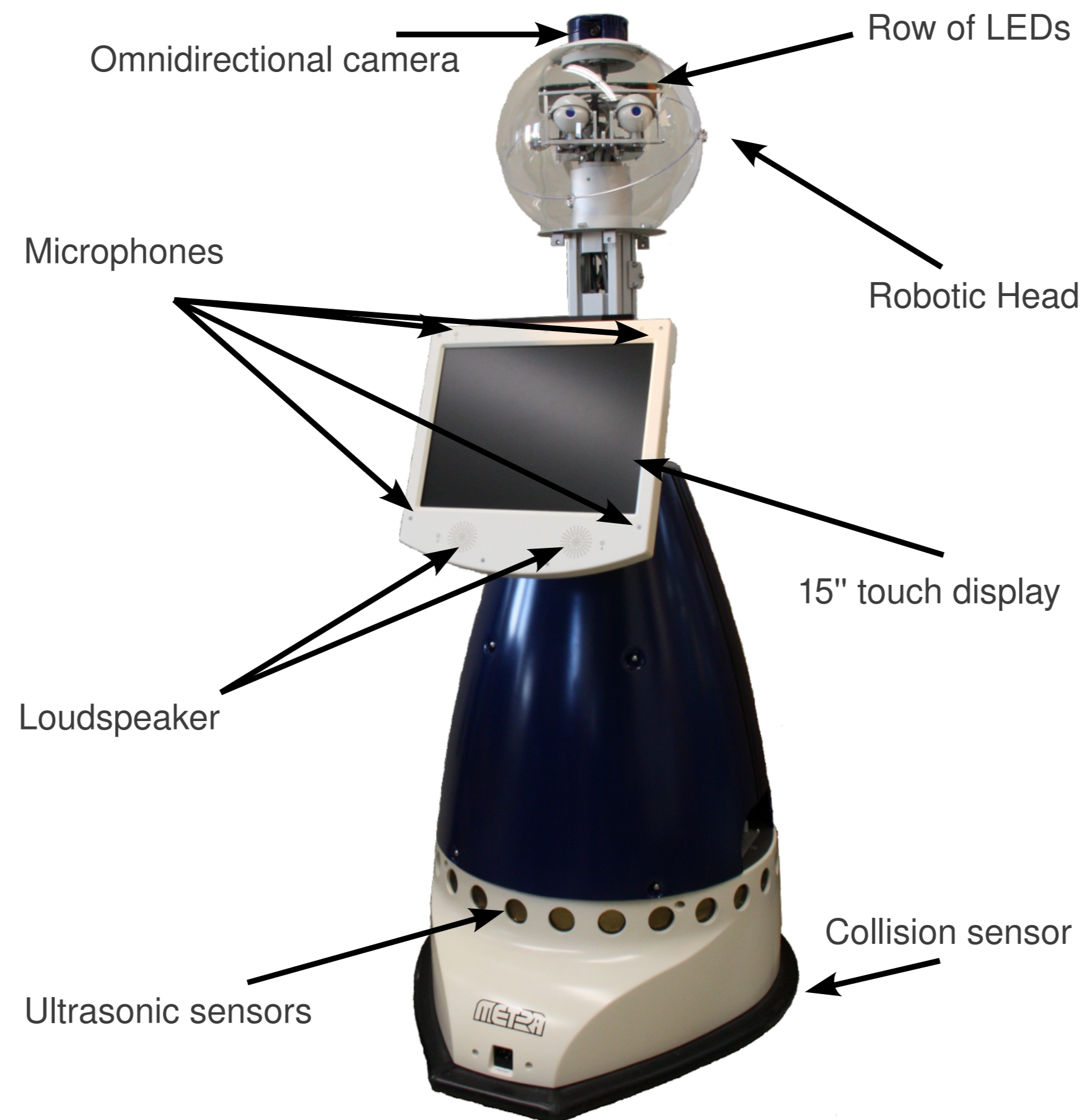
- 1.50 m tall
- Driving unit with differential drive system
- Movable robotic head
- 15" touch screen
- Omni-directional camera
- Four microphones
- Two loudspeakers

Technology

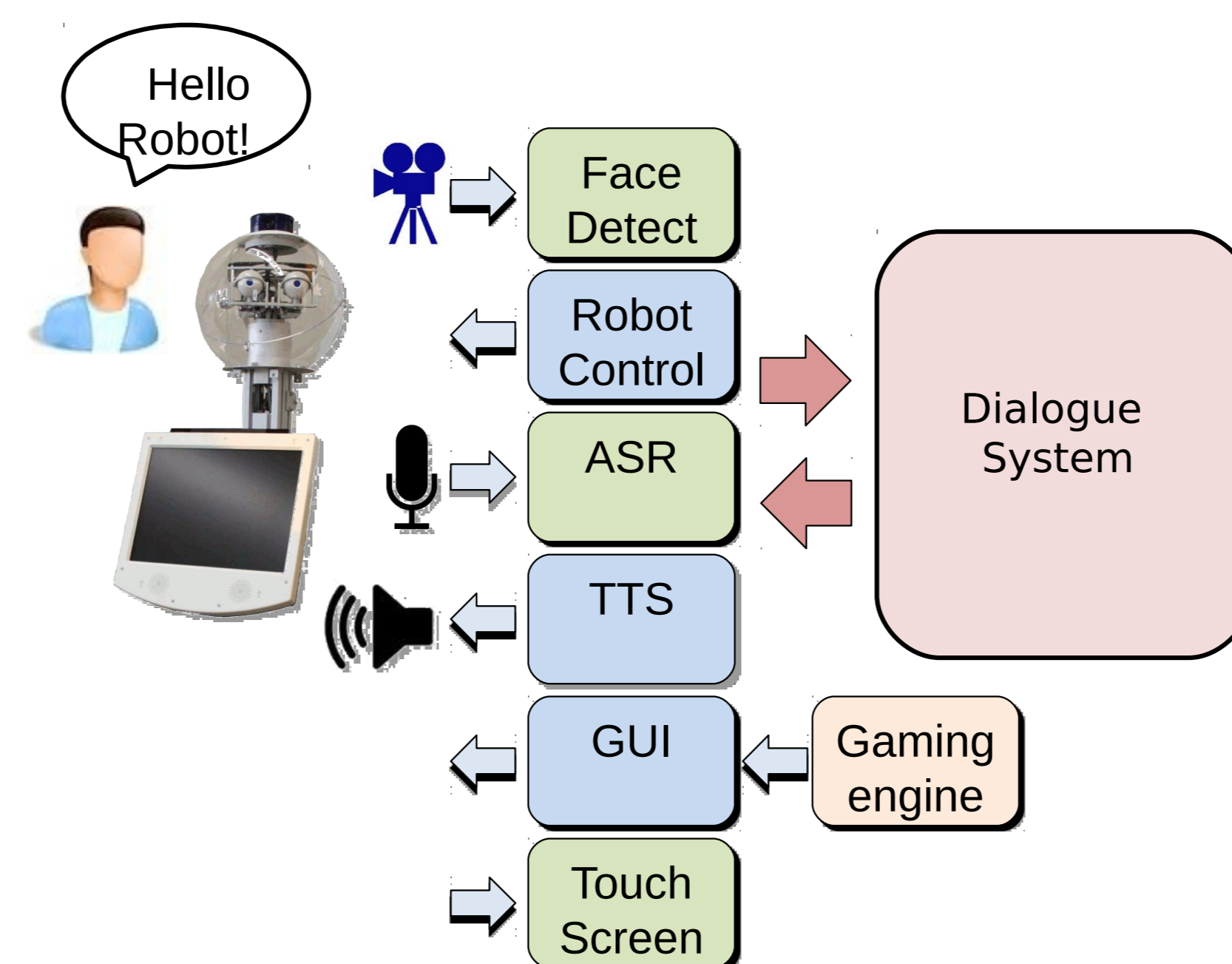
- Automatic speech recognition with natural language understanding
- Person identification using voice, face and leg-pair detection
- Services for net-based linking in order to promote social inclusion
- Autonomous, socially acceptable navigation
- Brain-Computer Interface

Target users

- People living alone at home
- Care facilities such as nursing homes



Software Modules:

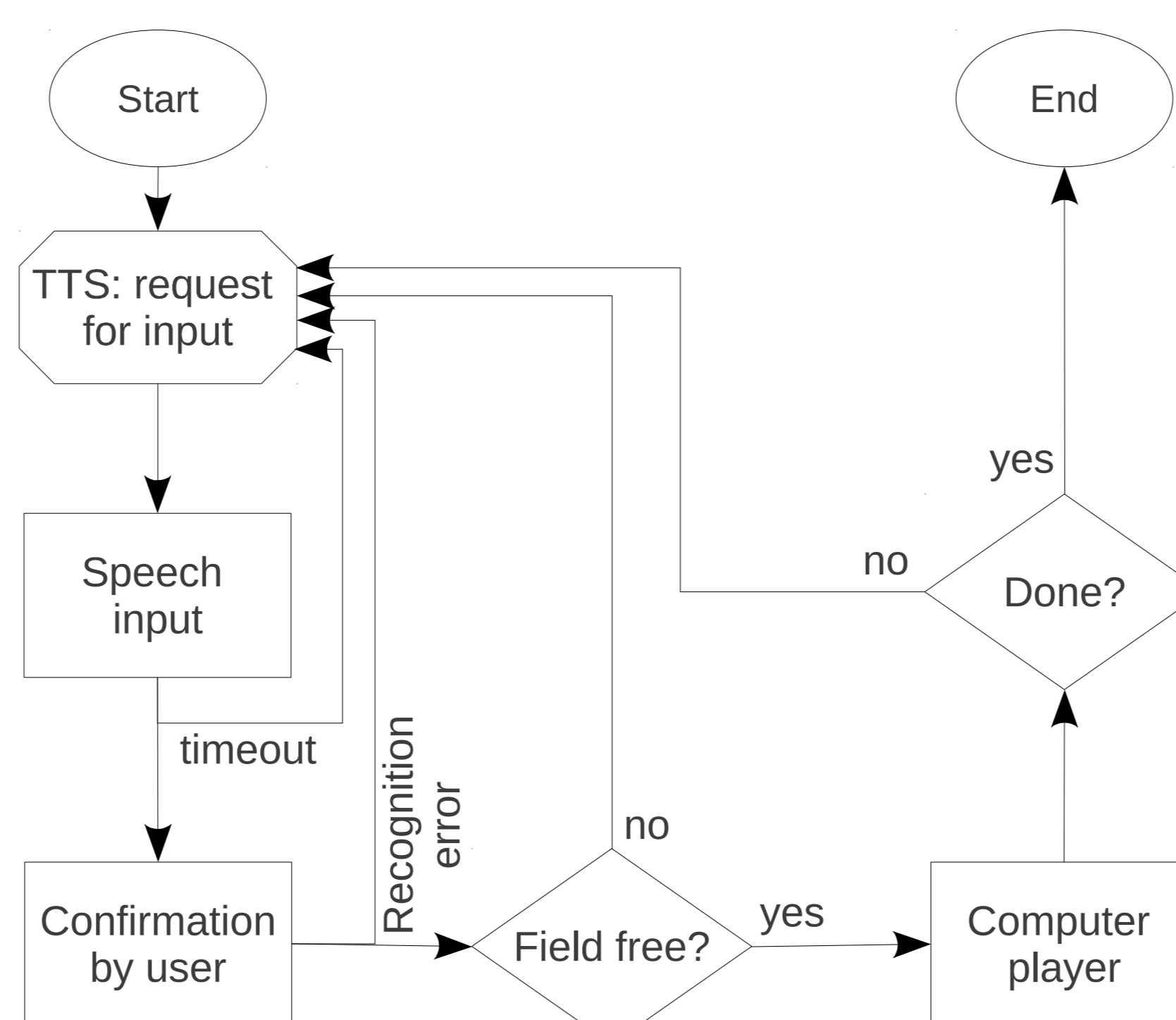


- Multiple input modalities
- Speech control
- Touch screen

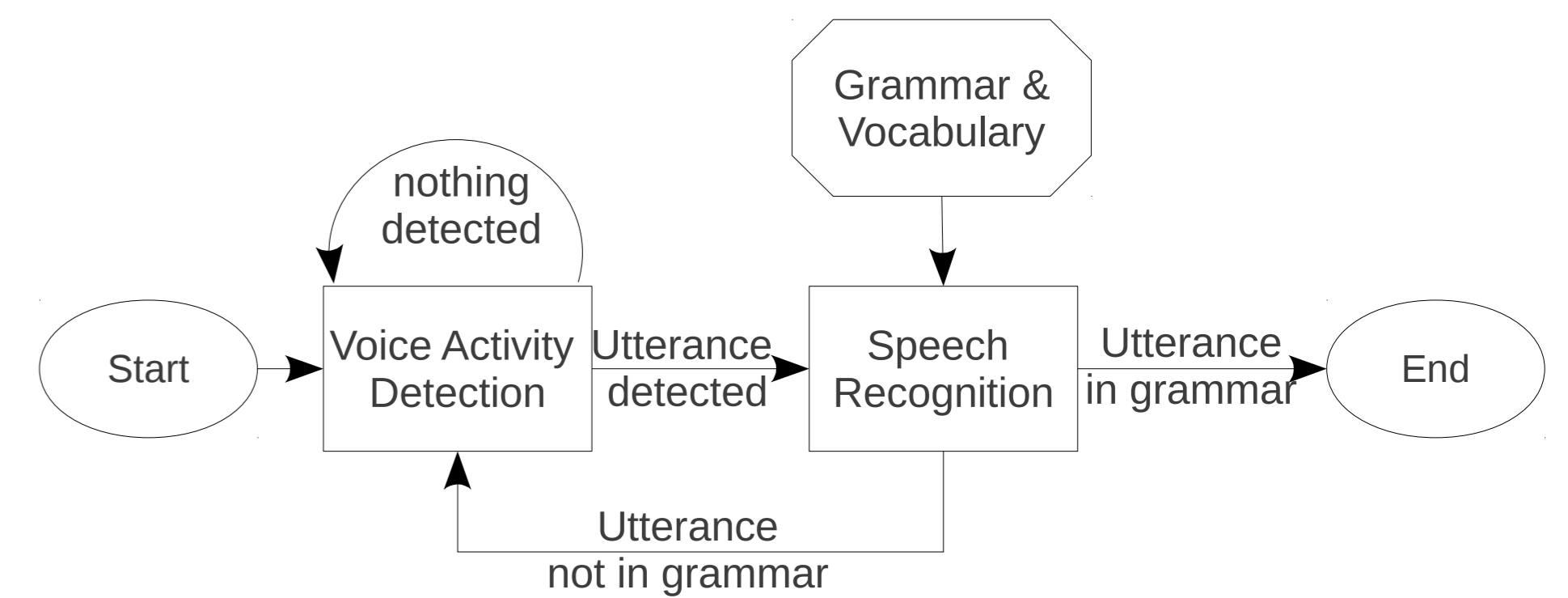
3. Dialogue System

- Automatic speech recognition
- Speech synthesis
- Dialogue control
- Linked to game engine

Dialogue flow chart



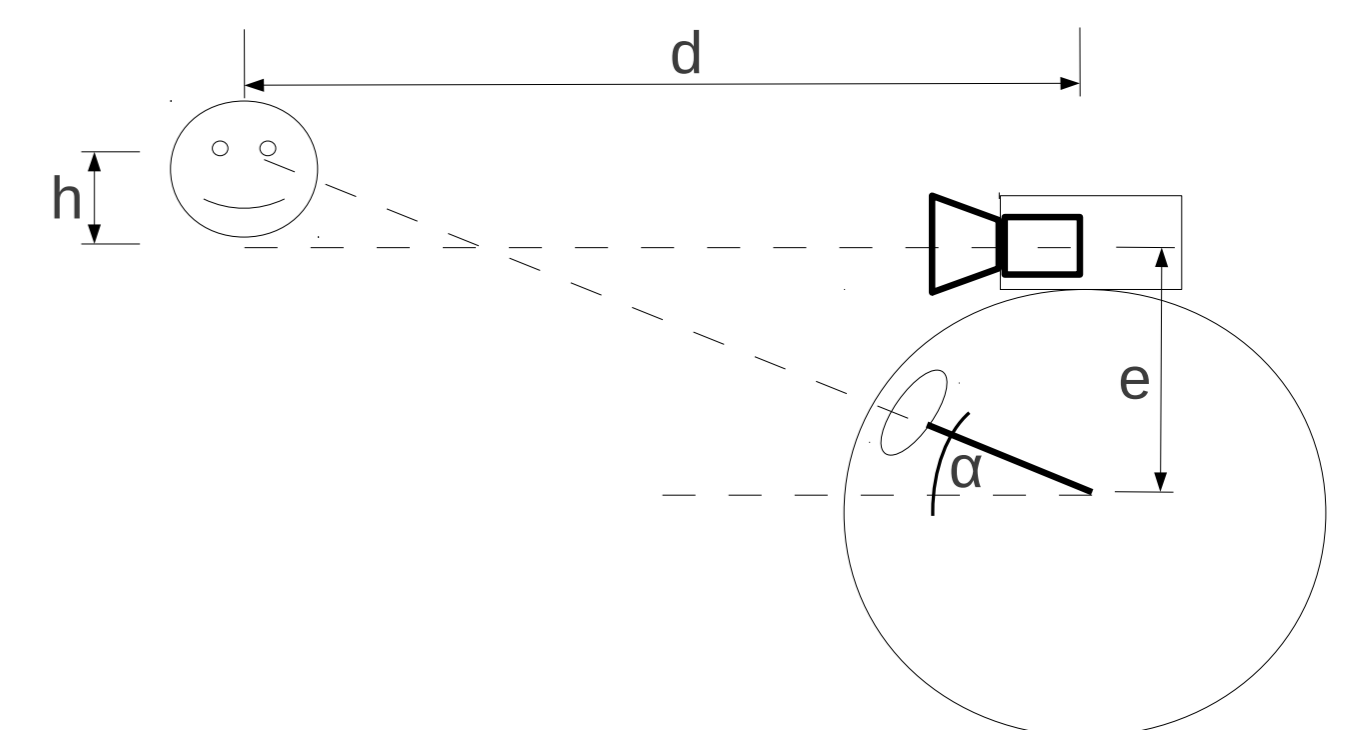
Speech Recognition



Gaze Behaviour

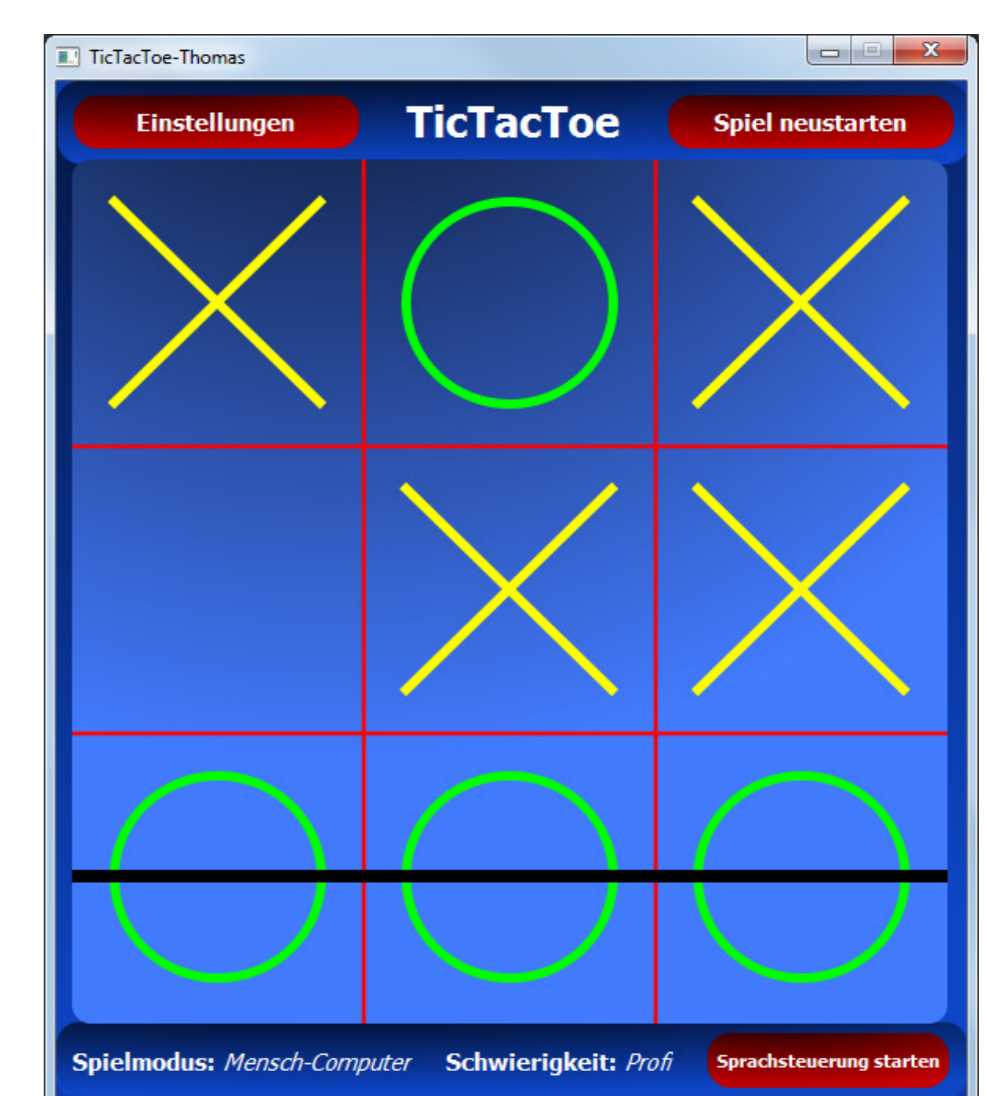
- Keep eye contact with user
- Face detection module
- Viola-Jones algorithm for face detection
- Turn head and eyes towards user

Face Detection



4. Use case: Tic-tac-toe game

- Two-person strategy game
- Simple rules
- Perfectly suited for speech control
- Two difficulty levels



5. Conclusions

- ALIAS as a communication platform
- Computer game with easy-to-use interface
- Natural gaze behaviour

This work was supported by the project AAL-2009-2-049 "Adaptable Ambient Living Assistant" (ALIAS) cofunded by the European Commission and the German Federal Ministry of Education (BMBF) in the Ambient Assisted Living (AAL) programme.



[1] T. Rehl et al., "Alias: Der anpassungsfähige ambient living assistant," in Proc. Deutscher AAL Kongress, 2011.

[2] K. Scheibl et al., "Die Einbindung von Nutzerinnen und Nutzern in den Entwicklungsprozess eines mobilen Assistenzsystems zur Steigerung der Akzeptanz und Bedarfsadäquatheit," in Proc. Deutscher AAL Kongress, 2012.