# Cognitive Interaction with Robots

**BRIEFING DOCUMENT**
**Academic Year 2025-20256**

## 1. GENERAL AIM

This project not only aims to validate the technical functionality of robotic interaction but also seeks to explore the social implications of human-robot interaction. The robot will serve as a platform to test how embodiment, communication strategies, and environmental factors influence user acceptance and overall interaction quality.

The main goal of this project is to implement and test an interactive behavior in a robot or electronic device, enhancing its ability to communicate and interact effectively with users.

## 2. SPECIFIC GOALS

The objectives are designed to cover both technical and social aspects of the project. By the end, students should be able to demonstrate the ability to integrate hardware, software, and human-centered methodologies into a coherent and testable solution.

1) Define system requirements.
2) Exploit the potential of the robot's embodiment.
3) Implement strategies to enrich communication.
4) Apply User-Centered Design principles.
5) Consider interpersonal and social rules in communication and space management.
6) Establish goal standards and metrics.
7) Define an Evaluation Plan.
8) Test the system.
9) Provide recommendations for redesign.

## 3. MAIN PARTS

This structure ensures that students develop both analytical and practical skills. Requirement analysis establishes the foundation, benchmarking provides a state-of-the-art overview, and

the proposed solution allows for creativity and innovation while remaining grounded in theory.

1) Requirement Analysis
    a) Context analysis: physical scenarios, social environment, and constraints.
    b) Target user profiles.
    c) Purpose of the system.
    d) Activities involved.
    e) Robot's behaviors (communication and motion).
    f) Robot's cognitive skills.
2) Benchmarking
    a) Evaluation of existing solutions, identifying strengths and weaknesses.
3) Description of the Proposed Solution
    a) Detailed description of implementation and tests.
    b) All design decisions must be justified with theoretical frameworks or previous works.

# 4. TEAMS

Team collaboration is crucial, as the project simulates real-world scenarios in which engineers must work in multidisciplinary groups. Communication and role distribution will significantly affect the efficiency and final outcomes.

1) Students will work in groups of up to 3 members.
2) Each student must understand in depth and be able to explain any part of the project.

# 5. DELIVERY

Late submissions may be penalized unless justified and previously agreed with the course coordinator.

The final submission should demonstrate professionalism in both structure and presentation, as it will be evaluated not only on content but also on clarity and readability.

1) Files must be uploaded to the Campus Digital in ONE compressed file containing:
    a) Project Report (PDF)
    b) Slides for the oral presentation

    c) Annexes
2) The report must be written in A4 vertical format.
3) Organization of the content must follow this structure:
    a) Index
    b) Abstract
    c) System Requirements
    d) Description
    e) Tests
    f) Conclusions
    g) References
    h) Annexes

## 6. EVALUATION

Beyond the numerical grading, the evaluation process emphasizes student growth. Feedback will be provided to highlight strengths and suggest improvements, ensuring that students learn from both their successes and mistakes. Active participation and initiative will also be taken into account as part of the holistic evaluation process.

Students will be evaluated individually based on the quality of the report, oral presentation, and performance during the discussion and demonstration.

Criteria include:

1) Report
    - Structure and organization of written outputs.
    - Correctness, clarity, and coherence of text.
    - Relevance and correct citation of references.
2) Presentation & Discussion
    - Active participation by all students.
    - Clear and fluent communication.
    - Ability to defend and explain design choices.
3) Demonstration
    - Functionality of the implemented behaviors must be shown in a live demo.

- Acceptance of alternatives (simulation or video-recorded demos) requires prior approval.

4) Weighted Evaluation
    - Work Defense: 30%
    - Final Report: 70%
    - Evaluation criteria:
        - course content
        - experimental setup
        - workload.
    - Demo