Project Title: Enhancing Neuroaffective Intelligence in Human-Robot Interaction for Mental Health Support.

Supervisory Team:
Dr Diego R. Faria, Reader in Robotics and Intelligent Adaptive Systems - Main supervisor
Prof. Farshid Amirabdollahian, Professor of Human-Robot Interaction, Co-supervisor

Project Summary: In the post-pandemic scenario, marked by a significant increase in the diagnosis of alterations in the mental health of children and adolescents, there is an evident need for integrated actions that address not only emotional symptoms such as stress, anxiety, and depression but also consider the implications on cognitive functions and children's ability to concentrate. This research aims to evaluate the effectiveness of therapeutic interventions, such as the use of human-robot interaction and assistive technology (facial expressions and brain-computer interfaces) to support the early diagnosis of mental health. The field of mental health has seen a surge in interest in recent years, with increasing recognition of the importance of innovative approaches to support individuals' well-being. Human-robot interaction (HRI) has emerged as a promising avenue for delivering mental health interventions due to its potential to provide personalized and accessible support. Neuroaffective intelligence, which involves the ability to perceive, interpret, and respond to human emotions and affective states, plays a crucial role in facilitating effective HRI for mental health. Statistical analysis of attention focus and engagement, along with facial expression detection, will be conducted through the use of Human-Robot Interaction. This practical stage will allow for the analysis and measurement of the emotional state and engagement of neurotypical and children with neurodevelopmental disorders in various contexts. This project will validate the idea that early detection and the application of assistive technologies represent significant contributions to understanding and promoting means to enhance mental health in children and adolescents.

Objectives: This project aims to leverage advances in neuroaffective intelligence and robotics to create empathetic and effective tools for mental health support. By developing robots' strategies capable of perceiving and responding to human emotions, we can augment existing mental health services and provide accessible support to individuals in need. Thus, the specific objectives are:
1. Development of machine learning models for enhanced neuroaffective intelligence capabilities for mental health support.
2. Development of machine learning models, including supervised and reinforcement learning models, to enable robots to respond appropriately to human stimuli and optimize interaction.
3. Insights into the effectiveness and user acceptance of the robot in delivering mental health interventions.

Person Specification: The successful applicant should have a first class or upper second-class honours degree or equivalent qualification in Computer Science or Electrical Engineering or other related degrees. Preferred skill requirements include basic knowledge of one or more topics such as machine learning, bio signals computation, artificial perception and/or robotics. We would particularly like to encourage application from women seeking to progress their academic careers. University of Hertfordshire is committed to the principles of the Athena SWAN Charter, and we pride ourselves on our vibrant, friendly, and supportive environment and family atmosphere.