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IM-TWIN PROJECT "Innovative AI tools to support children with ASD"

IM-TWIN: from Intrinsic Motivations to Transitional Wearable INtelligent companions for autism spectrum disorder is a research project funded by Horizon H2020, the European financing programme supporting research and innovation. The project's main goal is to develop new technology to support the early therapy of children diagnosed with Autism Spectrum Disorders (ASD). The project, with a duration of 24 months (1 November 2020 - 31 October 2022) and a total budget of € 1.9 million, brings together five international partners with different expertise:

- National Research Council of Italy (ITA) – through the Institute of Cognitive Sciences and Technologies – expert in Autonomous Robotics and Machine Learning, and coordinator of the project (www.istc.cnr.it);
- Center for Research and Interdisciplinarity (FRA), expert in Developmental Psychology (cri-paris.org);
- University of Rome *Sapienza* (ITA) – through the department of Human Neuroscience, section of Child and Adolescent Neuropsychiatry – expert in diagnosis and treatment of neurodevelopmental disorders (www.uniroma1.it);
- Utrecht University (NLD) – through the department of Information and Computing Sciences – expert in the study and analysis of emotional and affective physiological states (www.uu.nl);
- Plux Wireless Biosignals S.A. (PRT), a company specialised in the development and production of wearable sensors (www.plux.info).

The ambitious goal of IM-TWIN is to develop a technological system which - through Artificial Intelligence, Machine Learning algorithms and innovative interactive devices - will help to "understand" the emotional states of young children (aged between 24 and 48 months) diagnosed with ASD or other neurodevelopmental disorders, characterised by impairments in the social, communicative and affective areas.

This important information is often unclear in such types of children. This knowledge will then help and support the work of neurodevelopmental therapists and neuropsychiatrists, during the early treatment and early diagnosis of such conditions. To achieve its goal, the project will build an "IM-TWIN system" formed by several integrated components:

- wearable sensors, embedded in sensorised garments suitable for small children (e.g. t-shirts or socks), to detect and record physiological signals, as heart rate and electrodermal activity, related to the affective states;

- the latest algorithms, based on Artificial Intelligence and Machine Learning, to decode the physiological data into clear emotional categories as stress, boredom and enjoyment;
- interactive "intelligent" toys (called Transitional Wearable Companions), to be used as support tools during the therapeutic activities, to stimulate the children curiosity and motivate them to naturally engage in social interactions.

During the implementation of the project, the most successful components will be proposed, through dedicated dissemination activities, to interested therapists, neuropsychiatrists, rehabilitation and research centres, and the wide public.

Moreover, they will be proposed to companies and other economic agents for evaluation of their potential market exploitation. This exploitation activity will be supported by Quantum Leap IP (www.quantumleap-ip.com), a company sustaining research centers and startups to transform research outputs to market products.

IM-TWIN was born as a scientific spin-off of "GOAL-Robots", a previous European funded project (www.goal-robots.eu), investigating the importance of Intrinsic Motivations (the drives to learn new behaviours, based on curiosity) in the cognitive development of both natural and artificial agents.

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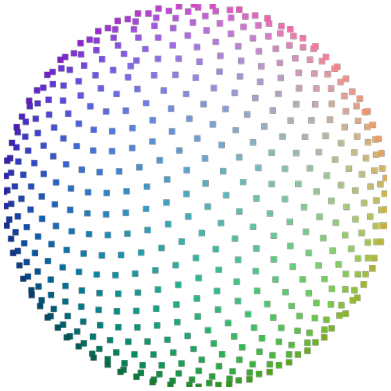
PROJECT LEGAL DETAILS

Timeframe: 1 November 2020 - 31 October 2022
Programme: H2020-EU.1.2.2. - FET Proactive.
Topic: FETPROACT-EIC-06-2019 - EIC Transition to Innovation Activities.
Funding scheme: RIA - Research and Innovation Action.
Cordis fact sheet: https://cordis.europa.eu/project/id/952095



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