

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 EARLY STAGE GRANT LASTING 12 MONTHS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENT OF MANAGEMENT, INFORMATION AND PRODUCTION ENGINEERING OF THE UNIVERSITY OF BERGAMO (A.R.F. 09/G1 – SYSTEMS AND CONTROL ENGINEERING – A.D. ING-INF/04 – SYSTEMS AND CONTROL ENGINEERING – CUP: E18B17000060009) TYPE B

announced with decree of the Rector Rep. no 290/2018 of 23.04.2018 and posted on the official registry of the University on 23.04.2018

RESEARCH PROJECT

"Development of technologies for the realization of beauty-care products personalized, safe, intelligent and ecological"

Research structure: Department of Management, information and production engineering

Duration of the grant: 12 months

Scientific Area: 09 - Industrial and information engineering

Academic recruitment field: 09/G1 – Systems and control engineering

Academic discipline: ING-INF/04 – Systems and control engineering

Scientific Director: Prof. Fabio Previdi.

The SL4A project aims to improve the quality of life, safety and comfort in domestic environments, of some of the most sensitive and most in need of protection groups: children and the elderly.

In the "Tender Age" scenario we will use modern ICT technologies (IoT, Big Data, wearable devices, artificial intelligence, domotics) to transform living environments into assistive environments capable of giving to the parents an innovative monitoring tool of their child. Also, the children themselves will have new tools that allow them to increase their autonomy in the management of some of their needs even before developing real interaction skills.

The architecture of the project will be based on:

Wearable systems for monitoring the child's physiological parameters (ECG, beat, respite, temperature)

Interactive toys (Smart Toys)

IoT bed (iCrib) for interaction with home automation systems

Big Data Analytics Cloud Platform (Baby Cloud)

Mobile app for parents

Web portal for medical doctors.

In the "Active Aging" scenario will be developed two products able to embed themselves in the architecture described above and provide the same services in the home automation systems:

a sensorized pajamas (hiJammies) for the monitoring of the physiological parameters of the elderly

an IoT night table, which, like the baby's bed, will offer connectivity with the Cloud Computing platform (BioData Cloud).

The candidate will carry out his activity in the development of the elements common to the platforms and with particular reference to the "Active Aging".

Research project:

1) Analysis of the Requirements of the "Active Age" Scenario and Specification Definition

In this activity we will analyze the scenario called "Active Age" which involves the development of products and services to be installed in the elderly home, in particular in the bedroom. The requirements of the products / services will be defined and a specification document will be drawn up which will be the main result of this activity.

2) Home automation communication

Based on the results of the definition-setting activity, various home automation technologies on the market such as Nest and MyHome will be integrated into the project. Depending on the choice of protocols and standards (Z-Wave, ZigBee, IFTTT, Lutron Clear Connect, Kidde, Bluetooth), the corresponding communication interfaces will be implemented. At the end of the activity, the list of devices on the integrated market with Smart Living 4 technology will be made available

3) Development of Artificial Intelligence Algorithms for Data Interpretation

Algorithms will be implemented that, observing the behaviors of caregivers, based on the parameters detected by biometric and environmental sensors, will control the Home Automation systems by sending operational signals.