

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 GRANT LASTING 12 MONTHS FOR CONDUCTING RESEARCH IN ACCORDANCE WITH ART. 22 OF LAW OF 30.12.2010 NO. 240 AT THE DEPARTMENT OF MANAGEMENT, INFORMATION AND PRODUCTION ENGINEERING OF THE UNIVERSITY OF BERGAMO (ACADEMIC RECRUITMENT FIELD 09/G1 – SYSTEMS AND CONTROL ENGINEERING) ACADEMIC DISCIPLINE ING-INF/04 – SYSTEMS AND CONTROL ENGINEERING - CUP: E18B17000060009

announced with decree of the Rector Rep. no. 76/2018 of 26.01.2018 and posted on the official registry of the University on 26.01.2018

RESEARCH PROJECT

TITLE: "Development of technologies for the creation of a system for monitoring children in the domestic environment"

General objectives of the project:

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).

Research project:

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

The research project scheme is the following:

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

In this activity we will analyze the scenario called "Tender Age" which involves the development of products and services to be installed in the child's 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) Development of Artificial Intelligence Algorithms for Data Interpretation

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

3) Integration of the iCrib and Test bed

In this activity the iCrib prototype will be integrated and communication with the wearable devices will be tested in order to obtain a demonstrator.