UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Biosensors and Monitoring

2324-5-H4102D034-H4102D139M

Aims

To understand the design and development of a data acquisition system. To provide knowledge on different tools and methods for collecting biomedical signals and extracting patient characteristics of interest. To present possible clinical applications by discussing some use cases, focusing in particular on the study of bio-parameters from patients with central nervous system disorders.

Contents

The course aims at providing the students with the basic knowledge about standard sensors used to measure and monitor biological parameters. The program explores a typical data acquisition and processing system, focusing on wearables-based systems. A laboratory experience allows the students to put their hands on a system used for the discrimination between different tremors deriving form different neurological pathologies.

Detailed program

Typical signal acquisition and processing chains. General information and operating principles of common sensors. Architecture of a data acquisition system. Basic knowledge of data processing. MATLAB tutorials for data acquisition and processing as a preparatory activity for the laboratory experience. Laboratory activity where the students will use an inertial sensor base platform for patients tremors identification.

Prerequisites

Basic knowledge of physics, mathematics and electronics.

Teaching form

- Frontal lectures
- At home tutorials
- Laboratory experience

Textbook and teaching resource

Course Handout (slides)

Semester

First semester

Assessment method

At the end of the course the student will be required to write a report on the laboratory experience. The evaluation of this report has the purpose of verifying the skills and competences acquired according to the objectives of the course.

Office hours

To be agreed by email with the professor

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING