UNIVERSITY OF GENOA
DEPARTMENT OF INFORMATICS, BIOENGINEERING, ROBOTICS AND SYSTEMS ENGINEERING
MASTER'S PROGRAM IN BIOENGINEERING

Thesis Project Form

Title (tentative): Sleep disorders detection and characterization

Thesis advisor(s): Casadio Maura, Matteo Moro, Francesca Odone Lino Nobili (Gaslini hospital)

E-mail: Maura.Casadio@unige.it

Address: Via Opera Pia 13, 16145 Genova (ITALY)

Phone: (+39) 010 33 52749

Description

Motivation and application domain

Sleep disorders profoundly impact quality of life and health, affecting cognitive function, emotional well-being and overall productivity, making research in this area crucial for understanding and improving sleep health. In this direction, video-based human motion analysis presents a promising avenue for studying sleep disorders non-invasively. By tracking and analyzing movements during sleep, this approach can provide insights into sleep quality, disturbances, and potential disorders. Understanding the correlation between specific movements and sleep patterns can contribute to more accurate diagnosis and personalized treatment strategies.

General objectives and main activities

The long-term goal of this project is the characterization of quantitative parameters that should allow the description of human motion patterns. In order to accomplish this goal, the proposed thesis has different aims:
- the research of parameters that could describe the quantity of motion during sleep;
- the extraction of meaningful parameters that could help the distinction of epileptic and parasomniac events;
- the supervised and unsupervised classification of the two different groups

Training Objectives (technical/analytical tools, experimental methodologies)

The student will learn:
1. Computer vision techniques in order to analyze images and videos;
2. How to use algorithms based on deep learning to estimate the pose of the people in the images;
3. To correlates data;
4. Machine Learning techniques that will allow the clustering and the classification of the data;
5. Improve the knowledge of Matlab and python.

Place(s) where the thesis work will be carried out: Neurolab, MaLGa Center (DIBRIS), Gaslini hospital

Additional information

Maximum number of students: 1