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

Dibris

Thesis Project Form

Title (tentative): Early detection of neuro-motor disorders in preterm infants: a video-based approach

Thesis advisor(s): Casadio Maura, Matteo Moro, Francesca Odone

E-mail: Maura.Casadio@unige.it

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

Phone: (+39) 010 33 52749

Description

Motivation and application domain

Monitoring the motion and development of preterm infants is essential for understanding their unique needs and ensuring timely interventions that can significantly influence their long-term health and developmental outcomes. In particular, monitoring and understanding their motion patterns through video-based analysis can offer crucial insights into their neurological development and health. Analyzing their movements in an unconstrained environment could help identify developmental milestones, detect abnormalities, and design tailored interventions to support their motor skills and overall well-beingMonitoring the motion and development of preterm infants is essential for understanding their unique needs and ensuring timely interventions that can significantly influence their long-term health and developmental outcomes. In particular, monitoring and understanding their motion patterns through video-based analysis can offer crucial insights into their neurological development and health. Analyzing their movements in an unconstrained environment could help identify developmental milestones, detect abnormalities, and design tailored interventions to support their motor skills and overall well-being.

General objectives and main activities

The long-term goal of this project is the computation of quantitative parameters that should allow the description and the classification of preterm infants 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 in a video;
- the extraction of the meaningful parameters that could help the distinction of normal and abnormal motion patterns;
- the supervised and unsupervised classification of the two different groups (infants with and without neuro-motor disorders).

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

Additional information

Maximum number of students: 1