



## Thesis Project Form

**Title (tentative):** Development of a quantitative approach for monitoring paediatric patients with thoracic malformations

**Thesis advisor(s):** TrÃ² Rossella, Fato Marco Massimo

**E-mail:** rosella.tro@dibris.unige.it

**Address:**

**Phone:**

### Description

#### Motivation and application domain

This thesis activity is part of the PNRR project Digital Health Solutions in Community Medicine (DHEAL-COM), aimed at strengthening and developing a Life Science Hub at a national for the co-creation of digital health services in which the needs of the individual are the starting point. Specifically, this work will involve the monitoring of pediatric patients suffering from both from Pectus Excavatum and other thoracic malformations such as Poland syndrome.

#### General objectives and main activities

Specifically, the main stages of the work will consist of:

â€¢ acquisition of patient images by systematic scanning using a low-cost 3D scanner

â€¢ possible reworking of the scan obtained on a CAD program in order to obtain a mesh

â€¢ processing of the acquired 3D mesh in order to extract clinical indicators of the severity of the pathology, according to the needs of clinical practice.

The ultimate aim of the proposed work is to ensure constant and more accurate supervision than just visual/photographic control by clinicians, and continuous monitoring of the patient in view of assessment and possible surgical planning.

#### Training Objectives (technical/analytical tools, experimental methodologies)

Image processing and statistical analysis of clinical data of pediatric patients affected by different thoracic malformations. Extraction of quantitative markers from imaging scans implies development of ad-hoc image processing pipelines (e.g. in Matlab or Python) specifically adapted to the age range under analysis.

**Place(s) where the thesis work will be carried out:** Neuroengineering and Systems Neuroscience Lab (DIBRIS),  
Ospedale Gaslini

### Additional information

**Maximum number of students:** 2