**Project**

**Title:** (title & pictures related to the project)
Paediatric and neonatal lung simulator

**Introduction:** (Explain the framework of the project and the problem to be solved)

The objective is to design a neonatal/paediatric lung simulator. These devices are useful both for research and educational purposes. Nowadays there exists a wide variety of them from very simple ones, even homemade with garden connectors (published in Anales de Pediatría An Pediatr (Barc). 2010; 73(4):202–206) to very sophisticated ones like SIMVENT. Former lung simulators are designed for research studies in order to check ventilator capabilities. On the other hand, simple lung simulators are used basically for educational purposes; they are cheap and even easily constructed. Unfortunately, these simulators are not very precise or reliable to create standard clinical scenarios, so the professor sometimes faces simulation problems during hands-on sessions.

**Project Brief:** (Describe the project specifying the main objective and its outcomes, design specifications, etc…)

Design a lung simulator for educational purposes able to create standard clinical situations like decrease of compliance, increase of resistance or leaks in neonatal and paediatric scenarios. The lung simulator has the following different parts:

- Design of the mechanical device transportable in a small suitcase. Two sizes of lungs available. Neonatal (25-50 ml) and paediatric lungs (125-250ml)
- Internal mechanism (resistance, etc) to generate pre-defined common clinical scenarios with several degrees of severity

A concept prototype of the device has already been developed by students of the precedent IDPS. The challenge is to continue developing the project so as to deliver, test and validate a fully operational prototype that could eventually be used in a real-field environment. To meet this challenge, performance by the prototype should allow for:

- Connection to different sizes of lungs
- Generation of changes in compliance and resistance
- Remote wireless operation by the instructor through an application running on a mobile device (smart phone or tablet)
- Testing and validation in a real-field simulation environment

**Company**

**Name:** Children’s Hospital Sant Joan de Déu

**Address:** Ps. Sant Joan de Déu, 2. 08950 Esplugues de Llobregat

**Contact person:** (name, e-mail, phone number)
Pedro Brotons
pbrotons@fsjd.org
93 6009767

**Project team:**

**Number of students:**

**Students speciality:**
- Business Management
- Mechanical engineering
- Electrical engineering
- Electronics engineering (to be confirmed)
- Chemical engineering
- Computer engineering
- Telecommunications engineering
- Design