



PhD in BIOINGEGNERIA / BIOENGINEERING - 39th cycle

PARTENARIATO PNRR Research Field: ADVANCED TECHNOLOGIES FOR POINT OF CARE DIAGNOSTICS BASED ON ELECTRONIC NOSES

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

Non-invasive respiratory support is crucial for providing less harmful treatments when possible. However, actual technologies are not suitable for very small patients as they cannot provide the assessments on the functional status of the respiratory system required for individualising respiratory support. Novel technologies for personalised non-invasive respiratory support in newborns and small children are therefore required to improve outcomes of preterm newborns.

This project research is in the framework of?ANTHEM: AdvaNced Technologies for Human-centrEd Medicine?Codice PNC0000003 CUP B53C22006720001PIANO NAZIONALE COMPLEMENTARE (PNC)Decreto Direttoriale n. 931 del 6 giugno 2022 AVVISO PER LA CONCESSIONE DI FINANZIAMENTI DESTINATI AD INIZIATIVE DI RICERCA PER TECNOLOGIE E PERCORSI INNOVATIVI INAMBITO SANITARIO E ASSISTENZIALE da finanziare nell?ambito del PNC

Methods and techniques that will be developed and used to carry out the research

The aim of this research is to address the limitations listed above by developing novel techniques and devices combining novel actuators and sensors with advanced control algorithms and electronics. These devices will also require the development of dedicated data processing algorithms for supporting the physicians in specific application such as 1) the transition and stabilisation of



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| | application such as 1) the transition and stabilisation of newborns at birth; 2) the individualisation of surfactant replacement therapy and 3) the weaning from invasive mechanical ventilation and respiratory support of infants and pre-schoolers who developed acute respiratory failure. The research will be supervised by Prof. Raffaele Dellaca', TechRes Lab, DEIB. |
| Educational objectives | The supervisor and his research group support the research development. Seminars and courses encourage an interdisciplinary approach. Laboratory activity completes the research path. Students are also encouraged to spend a period of study abroad (with availability of an additional financial support). |
| Job opportunities | Job opportunities include research both in academic and private institutions in Italy and abroad, and in industry. Spin-off and start-ups from research results are encouraged. Employment in this field offers various interesting opportunities. |
| Composition of the research group | 0 Full Professors 1 Associated Professors 2 Assistant Professors 4 PhD Students |
| Name of the research directors | PROF. RAFFAELE DELLACA' |

| Contacts |
|----------------------------|
| raffaele.dellaca@polimi.it |

| Additional support - Financial aid per PhD student per year (gross amount) | |
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| Housing - Foreign Students | -- |
| Housing - Out-of-town residents (more than 80Km out of Milano) | -- |

| Scholarship Increase for a period abroad | |
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| Amount monthly | 700.0 € |
| By number of months | 6 |

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| Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information |
| Educational activity: The student will be encouraged to attend to courses at POLIMI or abroad |



in International Schools.

Teaching assistantship: There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer and desk availability: the student will be allowed to access facilities of the DEIB.

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