DC11: AI for early Recognition, Diagnosis and Personalized Treatment strategies for sepsis

Host institution: National and Kapodistrian University of Athens (UoA), Athens, Greece

Supervisor: Prof. Evangelos J. Giamarellos-Bourboulis

Chairman: European Sepsis Alliance

Board member: Global Sepsis Alliance

President: Hellenic Institute for the Study of Sepsis (https://sepsis.gr/)

President: Hellenic Society for Chemotherapy

Co-supervisors: Professor Vissarion Papadopoulos, National Technical University of Athens, Prof. Iolanda Francolini, Sapienza University of Rome.

Project description: Sepsis remains a leading cause of mortality in patients with wound infections, largely due to delayed diagnosis and the lack of tools for personalised treatment. Current clinical approaches rely on generalised protocols that do not fully account for patient variability or the dynamic progression of infection.

This PhD project focuses on the development of artificial intelligence (AI) models for the early recognition, diagnosis, and personalised management of sepsis associated with wound infections. The project will explore the use of advanced machine learning approaches, including deep learning and time-series analysis, to identify patterns in clinical data and predict disease progression.

A key objective is to identify relevant clinical and biological markers that contribute to sepsis onset and progression, and to integrate these into predictive models capable of supporting clinical decision-making. The project will also investigate human-in-the-loop AI strategies to optimise treatment recommendations based on patient-specific responses.

The doctoral candidate will be trained in AI methodologies, data analysis, and clinical data interpretation, alongside exposure to infection biology and healthcare applications. The outcomes will contribute to the development of predictive tools for personalised sepsis management within the broader HEAL-4WARD programme.

Host laboratory: 4th Department of Internal Medicine, ATTIKON University Hospital

Secondments: This project is carried out in collaboration with the following groups, and visits to their laboratories are expected during the project. A willingness to travel and spend time abroad is therefore essential:

- Dr. Gustavo Bodelón, University of Vigo, Vigo, Spain
- Prof. Iolanda Francolini, Sapienza University of Rome, Rome, Italy

Eligibility conditions:

- Master's degree in Computer Science, Data Science, Artificial Intelligence, Bioinformatics, Biomedical Engineering or related fields.
- Applicants must be doctoral candidates, i.e not already in possession of a doctoral degree.
- Mobility rule: researchers must not have resided or carried out their main activity in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.

Required skills:

- Experience in data analysis, machine learning, or statistical modelling, ideally demonstrated through Master's thesis work or research internships.

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- Familiarity with programming for data-driven research and handling complex datasets would be beneficial.
- Prior exposure to biomedical data, clinical research, or healthcare-related applications is an advantage.
- Proficiency in the English language is required, as well as good communication skills, both oral and written. Successful candidates will need to provide an English test (e.g. IELTS, TOEFL, Cambridge English). You may be exempt if you are a national of a majority native-English speaking country, or have qualifications / degree that has been taught and assessed in English. The supervisor may also confirm that a candidate has the required level of English.

Enquiries:

For general information about the HEAL-4WARD Doctoral Network visit the project website (www.heal-4ward.eu) or send an email to heal4ward@gmail.com. For additional information on this project please contact Ms Stavrina Maltezaki (stamalt@med.uoa.gr).

How to apply

To learn more about the application process, visit the HEAL-4WARD recruitment web page (www.heal-4ward.eu/open-positions).

Required documents:

- Statement of interest (limit of 2,500 characters) explaining why you wish to be considered for the fellowship and which qualities and experience you will bring to the role.
- Curriculum vitae et studiorum.
- A certificate of University examinations taken (with marks).
- A final degree certificate translated in English. If, at the time of application, candidates should not be yet in possession of a degree certificate, they can submit it at the time of the examination.

A limited number of applicants will be invited for an interview and will be required to provide contact information of up to two contact person for reference letters.

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