Europe promotes AI-based personalised care for respiratory disease

AI-Based Personalised Care for Respiratory Disease using Multi-Modal Date in Patient Stratification

Lung diseases pose a significant global health threat, causing severe illness and millions of deaths annually. These diseases account for over 10% of disability-adjusted life-years (DALYs). One of the primary challenges in treating lung disease is the wide array of possible conditions. Unfortunately, traditional clinical approaches require extensive multidisciplinary teams and a range of diagnostic tools, leading to increased costs, time, and resources used.

AI4LUNGS is a three-and-a-half-year European research and innovation project with the primary objective of creating and validating AI tools and computational models to improve patient stratification, ultimately optimizing the diagnosis and treatment of respiratory diseases— Interstitial Lung Diseases (ILDs), Infectious Diseases and cancer.

It aims to support physicians in their decision-making during the diagnosis and treatment processes, streamlining and digitalising procedures, potentially saving time, and reducing the need for numerous examinations compared to traditional approaches. The feasibility and efficiency of the developed solutions will be evaluated in 2 pilots.

The project is in the domain of the tools and technologies for a healthy society, on developing new AI tools, using different types of data collected in clinical practice, e.g., lung auscultation, X-ray, CT, PET, clinical analysis, demographic, and clinical data. It stands for AI-based personalized Care for Respiratory Disease using Multi-Modal Data in Patient Stratification.

AI4LUNGS has received recognition and funding of €6.9M from the European Commission and the European Health and Digital Executive Agency (HADEA), under the topic HORIZON-HLTH-2022-TOOL-12-01-two-stage: Computational models for new patient stratification strategies (RIA).

Transforming lung care with AI-driven diagnostic

The project aims to holistically address lung health by streamlining the diagnostic process from the initial patient appointment and assessment to the actual therapy.

AI4LUNGS innovates on two fronts: developing technologies to improve the devices and tools used in diagnosis decisions and integrating all the new tools in a single platform (digital twin) capable of monitoring and advising during the entire clinical decision. This platform, leveraging data from partner hospitals, accompanies the clinical process to offer healthcare professionals recommendations without disrupting standard practices.

In addition, AI4LUNGS introduces two novel technologies to the medical field: digital auscultation and early-stage liquid biopsy in the decision support systems, where the second one aims to identify cancer types more efficiently and reduce unnecessary examinations, thereby speeding up the diagnosis process and cutting costs.

The team behind AI4LUNGS

The project is led by the Portuguese research institute INESC TEC. It involves a diverse consortium representing 10 countries and comprising a total of:

- 9 organizations in the AI and clinical research and education domains
- 3 clinical centres
- 4 partners specialized in information systems, secure data management, compliance, and innovation
- 1 governmental organization dedicated to health policy development and regulation
- 1 organization responsible for project dissemination and communication activities

"*AI is at a critical stage of research and implementation. Patient stratification is an area with great potential. It is a project that holds a lot of promise*". - João Claro, Vice Chairman and CEO of INESC TEC.

This consortium composition enables the project to tackle the whole life-cycle patient categorisation, improve diagnoses and treatments, propose beyond-state-of-the-art technologies, and contribute to the challenges associated with the proliferation of respiratory diseases.

The AI4LUNGS project officially started on the 1st of January 2024 and the kick-off meeting took place on the 27th and 28th of February 2024, in Porto, Portugal, hosted by INESC TEC.

Over the following months project news, publications, and outputs will be available on the official project webpage at www.ai4lungs.eu and distributed via the project's social media channels on LinkedIn @AI4LUNGS and Twitter @AI4LUNGS.