EMERALD

News, insights, and announcements - Issue #1

Welcome to the first edition of the EMERALD newsletter.

Dear readers,

We are excited to introduce the first edition of the EMERALD Newsletter, marking the start of our journey in developing innovative solutions. In this issue, we share EMERALD's vision, goals, and key use cases, focusing on how our project aims to improve the diagnosis of Coronary Artery Disease (CAD) and Non-Small Cell Lung Cancer (NSCLC) using artificial intelligence and decision-support systems.

Enjoy, The EMERALD Team

INSIDE

—

Objectives

EMERALD focuses on innovative diagnostics in nuclear medicine, enhancing model interpretation and patient-specific care.

—

The research team

Experts in medicine, data science, and technology, working together to drive innovation.

EMERALD deals with two major challenges in Nuclear Medicine

EMERALD's focal point is Coronary Artery Disease and Non-Small Cell Lung Cancer
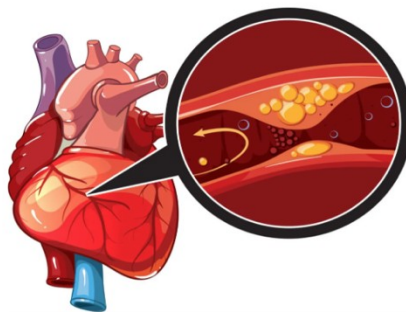
Coronary Artery Disease

Cardiovascular Diseases (CVD) remain fatal diseases across the world, whilst the early and non-invasive detection and prognosis is still an open issue. CDVs are the leading cause of death in the EU.

Non-Small Cell Lung Cancer

NSCLC constitutes the major cause of cancer deaths worldwide in both men and women accounting for approximately 85% of the total lung cancers

EMERALD Kick off

We are excited to announce the launch of the EMERALD project, a groundbreaking initiative in nuclear medicine. This project represents a significant leap in medical diagnostics, focusing on enhancing the interpretability of complex models in nuclear medical diagnosis through innovative fuzzy cognitive explainable analytics.

In the first issue, we delve into the core objectives of EMERALD. Our primary goals are to improve the early and non-invasive detection of Coronary Artery Disease (CAD) and Non-Small Cell Lung Cancer (NSCLC). These two areas are pivotal in our mission to

address some of the most challenging health issues globally.

We also introduce our interdisciplinary team of experts who are pioneering this research. From nuclear medicine specialists to data scientists, each member plays a crucial role in driving forward our ambitious goals.

Objectives

EMERALD: Pioneering Nuclear Medicine Through Fuzzy Cognitive Analytics

EMERALD takes a unique, holistic approach to patient-specific predictive modelling and MDSS development by extracting and integrating knowledge from research, clinical tests, and EHR using advanced analytic techniques. ICT technologies (such as Data Mining, Deep Learning (DL), and Advanced Fuzzy Cognitive Tools) will play a key role in EMERALD enabling the analysis simplification of large patient data collections, explainability of decisions made and thus allowing the development of personalized predictive MDSSs

Use cases

Tackling Major Health Challenges: CAD and NSCLC

At the heart of EMERALD are two critical areas of focus: Coronary Artery Disease (CAD) and Non-Small Cell Lung Cancer (NSCLC). Our research is dedicated to addressing these leading causes of death by leveraging non-invasive detection techniques and predictive analytics. Our approach promises a new era in the early detection of these diseases.

https://emerald.uth.gr/

Research Team-Meet the Minds Behind EMERALD

At the core of EMERALD's groundbreaking research is our distinguished team, led by Professor Elpiniki Papageorgiou. As the principal investigator, Professor Elpiniki Papageorgiou brings unparalleled expertise and vision to the project. Postdoctoral researchers Ioannis Apostolopoulos, Serafeim Moustakidis, and Konstantinos Kokkinos contribute their expertise in artificial intelligence, and computational modelling, enhancing EMERALD's research and innovation. Collaborating faculty members Nikolaos Papandrianos, Dimitrios Apostolopoulos, and Nikolaos Papathanasiou have a crucial role in enriching our research with their specialized knowledge and experience as nuclear medicine doctors, contributing valuable insights to the project. Our team also includes dedicated doctoral candidates Anna Feleki, Agorastos-Dimitrios Samaras, and Theodoros Tziolas, who contribute to the development of cutting-edge research methodologies, enhancing the project's innovation and impact. Our team also includes two external collaborators: Dr. Javier Andreu-Perez, Senior Lecturer at the School of Computer Science and Electronic Engineering (CSEE), and Dr. Jose Maria Alonso Moral, a researcher at the Research Center on Intelligent Technologies (CITIUS) at the University of Santiago de Compostela (USC). Their expertise in AI and intelligent systems further strengthens our research and innovation efforts. Together, this team embodies a blend of expertise and passion, driving EMERALD towards new horizons in nuclear medicine diagnostics.