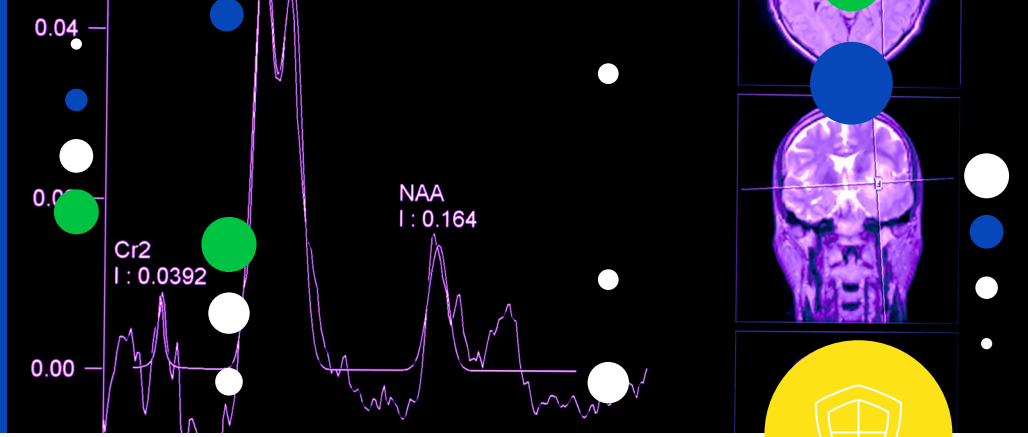
ITEA4

Project Profile



Spectralligence

Miniaturisation and simplification in Molecular and Atomic Spectroscopy

To help companies and end-users take advantage of ever-expanding opportunities, the Joint AI Call 2020 project Spectralligence (Spectral Analysis in life sciences and materials sciences through Artificial Intelligence) will use AI to miniaturise and simplify Molecular and Atomic Spectroscopy technologies for greater affordability and usability by non-experts.

Addressing the challenge

Molecular and Atomic Spectroscopy is a set of technologies that use the electromagnetic spectrum to generate unique fingerprints for molecular structures. Although this is well-established in domains such as pharmaceuticals, wastewater management, explosives detection and remote sensing, the market is seeing rapid technological development via component miniaturisation and increased embedded processing power. Application areas are also expanding with innovations like personalised medicine or environmental surveillance.

As the acquisition and interpretation of spectral data currently requires highly-trained experts, a reduction in human dependency is needed to further develop the field and bring novel technologies to fruition.

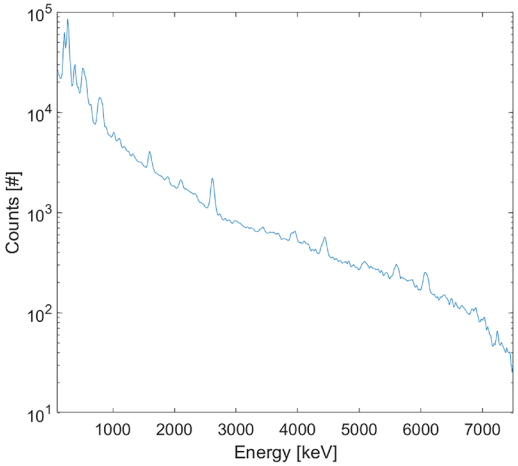
Proposed solutions

With a consortium of industrial, academic and SME partners in Finland and the Netherlands, Spectralligence aims to augment innovations in micro-electronics and component miniaturisation with cross-domain validated neural networks for spectral analysis. As the focus lies on sensing applications enabled by miniaturised components, the project will apply AI and deep learning to two key areas: (1) robust data (pre-) processing and spectral denoising, and (2) feature extraction from the resulting spectroscopic datasets.

Ultimately, Spectralligence's embedded AI technologies will enable one-click spectral characterisation in the materials and life sciences. The resulting implementations will enhance and replace expert users in the data workup of various technologies, thereby advancing the adoption of Molecular and Atomic Spectroscopy devices and services.

users, leading to substantial reductions in research and development time as well as higher-quality outputs. As a result, the project partners aim to increase their market share in Molecular and Atomic Spectroscopy devices and services, worth USD 5 billion globally in 2017 and expected to grow to USD 6.85 billion in 2022 with a compound annual growth rate (CAGR) of 6.6%.

By additionally targeting sub-segments with high probable growth rates, such as safety and security services (13.3%) and healthcare biomarkers (13.7%), Spectralligence's commercial partners



Gamma-ray spectrum from in-elastic neutron scattering from a narcotic simulant.

Projected results and impact

As products in the Molecular and Atomic Spectroscopy value chain are used in highly-regulated environments, Spectralligence's embedded AI innovations will be rigorously developed to comply with standard industrial and regulatory processes. These will transform complex spectroscopy products into simple, cost-effective solutions that can be tailored to a broader field of

expect to generate a total annual revenue increase of EUR 40-60 million within three years of the end of the project as a direct impact of the AI technologies developed.

Project partners

Spectralligence
20209

The Netherlands

Dynaxion

TU/e Eindhoven University of Technology

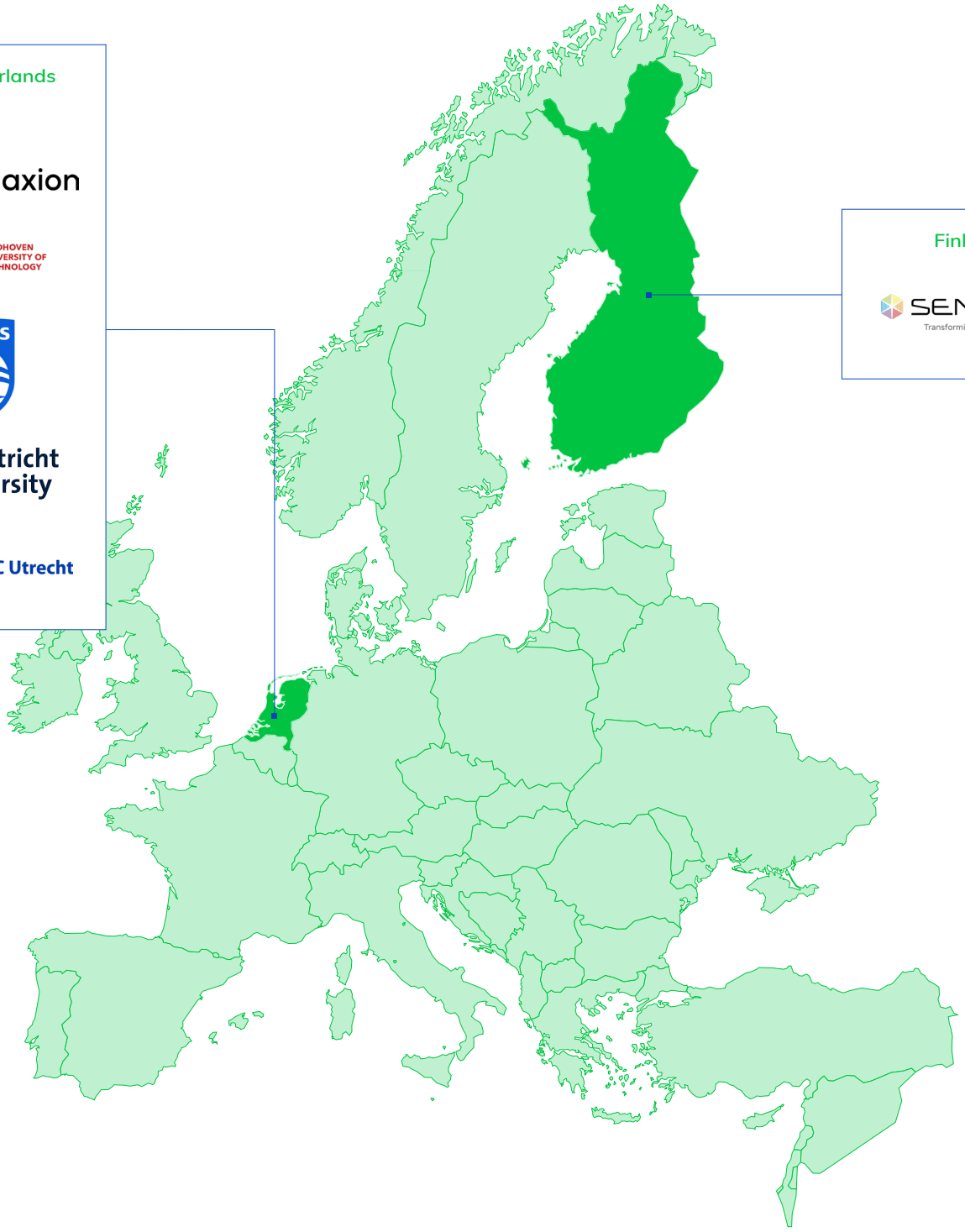
PHILIPS

Maastricht University

UMC Utrecht

Finland

SENSMET
Transforming water analytics.



Project start
November 2021

Project end
October 2024

Project leader
Johan van den Brink, Philips

Project email
johan.van.den.brink@philips.com

Project website
https://spectralligence.eu/

ITEA is the Eureka R&D&I Cluster on software innovation, enabling a large international community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society. ITEA is part of the Eureka Clusters Programme (ECP).

https://itea4.org

ITEA 4

eureka