Versie 2022.01

Smart Health and AI meet our community

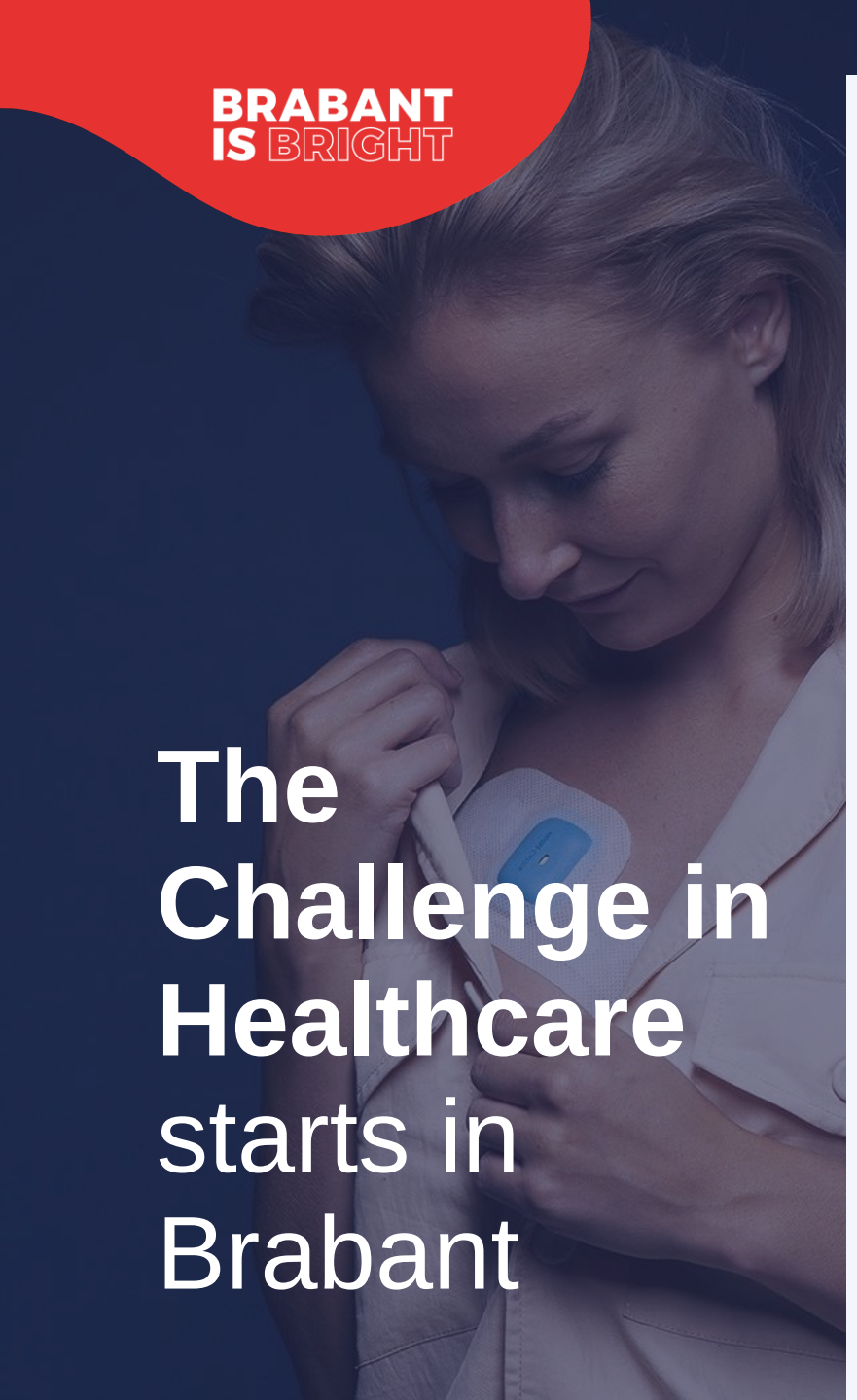
We invite you to meet our community and discover our success story!

BRABANT IS BRIGHT

Based on a history of over 100 years of Medtech innovation initiated by Philips, Brabant is an increasingly popular location for Medtech companies, especially Smart Health. In Brabant you will find an ‘Industry Based Ecosystem’, where people know what it takes to get a product into the market.

And the proof of this are recent showcases Philips has been awarded as the most innovative health technology company according to Boston Consulting Group but also the flourishing ecosystem with the High Tech Campus Eindhoven the smartest square kilometer of Europe and the Dutch Design Week in Eindhoven as the largest design event in Northern Europe with a special focus on health.

BRABANT IS BRIGHT



The Challenge in Healthcare starts in Brabant

TODAY

2000

Becoming strong in the world of Smart Health and AI was a natural development for Brabant, where high tech and life sciences and health have gone hand-in-hand for many decades. Brabant is of course home to Philips (healthcare), one of the world's largest medical technology providers, as well as FEI (now Thermo Fisher Scientific) and GE Healthcare Life Sciences Core Imaging and their suppliers on the life sciences and health side, and ASML, NXP, Philips (Research and Innovation) and their full supplier network on the 'traditional' high tech side. These communities met, mingled and matched and data and AI communication became an integral part of their business models. The High Tech Campus Eindhoven in particular is one of those hotspots of open innovation where research companies – large and small – have been combining their various fields of expertise for ages.

THE CHALLENGE

The challenge in healthcare today has been formulated very clearly by Sioux Technologies, one of those Eindhoven high tech companies and heavily involved in healthcare technology development:
'Because of the rising number of elderly people, we are seeing an increase in chronic diseases and staff shortages. This has profound consequences for the carelifecycle. Because of increasingly complex technology and digitisation, the need for reliability and the security of devices and Data and AI is also growing. Technological innovation therefore determines the success of OEMs in the medical industry. In addition, the technology must find its way to the market in a fast and cost effective manner in the shape of sensible user-friendly products.'

PHILIPS
SIOUX TECHNOLOGIES
Holst Centre
DEMCON
TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY
IBM
HIGH TECH CAMPUS EINDHOVEN
PHILIPS Healthcare
LIFESENSE
DIMENCO

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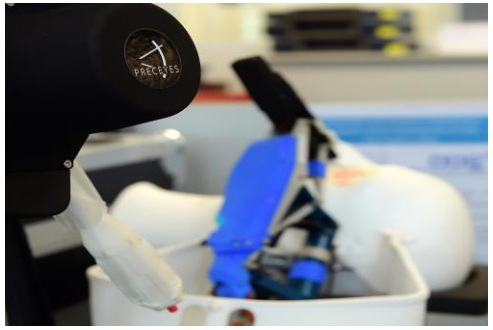
Why Brabant excels in Smart Health & AI?

TALENT, IT & DESIGN



Eindhoven is known as the city of Design with famous institutes like the Holst Center and the Dutch Design Academy and offers the biggest pool of IT talent in the Netherlands.

HIGHLY SPECIALIZED CAMPUS

In Brabant there are several highly innovative campuses like the **High Tech Campus Eindhoven**, TU/e campus, BIC & Maxima MC that contribute to a unique ecosystem. These campuses are home to innovators, researchers, engineers that create the technologies and business of tomorrow.

ADAPTIVE COLLABORATIVE CULTURE

The people in Brabant have an adaptive and collaborative culture. People are used to change and are working in an international environment.

PHILIPS MEDTECH CLUSTER AND FULL LS&H SUPPLY CHAIN

Eindhoven is the home of **Philips Healthcare** and, over the space of 125 years, a perfectly woven network of knowledge institutes (TU/e, Holst Centre), suppliers and partners has evolved in the region.

BRABANT IS BRIGHT

Our Ecosystem

World Class Research

Within a radius of 150 km around Brabant, there are 27 universities in three countries: a total of 605,340 students, 255,680 of which in the field of nature, health or technology. These are the leading research institutes for IT & Data Science technologies.

WORLD CLASS RESEARCH

1. **JADS (Den Bosch)** offers data science bachelor and master programs, PDEng education, professional education and help organizations shape their data driven future. The Health sector is a Priority Industry to JADS.
2. **University of Technology (Eindhoven)** is a research university specializing in engineering science & technology. The university has a Department wholly focused on Life Sciences & Health.
3. **EAISI (Eindhoven Artificial Intelligence Systems Institute)** is an AI research institute with a dedicated unit focusing on “AI for Health”.
4. **Holst Centre** is an independent research and innovation center that focuses on innovations for improving health and wellbeing and on guaranteeing sustainable environments.
5. **Tilburg University** is a research university specializing in the social and behavioral sciences, economics, law, business sciences, theology and humanities. The university has an AI Special Interest Group focusing on Health and care.
6. **Fontys University of applied sciences** is a university of applied sciences that actively contributes to healthcare advances in general and the paramedical

BRABANT IS BRIGHT

Our **Ecosystem**

Leading companies

Brabant accounts for almost 10,500 IT & Data Science companies and 12.1% of all jobs of the total sector in the Netherlands. These are the leading companies in the field of Smart Health and Artificial Intelligence.

LEADING COMPANIES

1. **Philips Medical** in Eindhoven does spectral analysis in life sciences through AI and automation, surgery support and intuitive 3D visualization.
2. **GE Healthcare** is a provider of technologies, digital infrastructure, data analytics and decision support tools used in the diagnosis, treatment and monitor patients.
3. **Sioux Technology** specializes in embedded software for high-tech systems, developing and constructing complex high-tech products and production systems.
4. **Adimec** develops and manufactures high-performance cameras for key market seg-ments, including machine vision, healthcare, and global security.
5. **Thermo Fisher Scientific** is exploring augmented and virtual reality (AR & VR) applications for electron microscopy, simulating real-world equipment.
6. **Teledyne Dalsa** is active in digital imaging and micro-electromechanical systems, applied in areas including aerial photogrammetry, factory automation, and medical radiography.

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Key University

University of Technology Eindhoven

Both AI and Data Science are Strategic Research area's of the TU/e. This field even has an dedicated Research Lab: **Artificial Intelligence and Data Engineering lab.**

KEY OPINION LEADER

Carlo van der Weijer

Carlo van de Weijer advises ministries and industries around the world on the future of mobility/AI and is member of the supervisory board of several high-tech companies and start-ups. He is an international speaker on exponential technology and the future of high-tech, amongst others as faculty member of Silicon Valley based Singularity University. Furthermore, he is a weekly columnist in the leading Dutch financial newspaper.

EASI

The Eindhoven AI Systems Institute brings together all TU/e artificial intelligence activities. Top researchers from the various research groups work together to create new and exciting AI methodologies and applications with a direct impact on the real world.

"AI for the real world".

Leveraging the development of artificial intelligence through an interdepartmental approach. AI and Data science is part of most TU/e programs. Dedicated courses are:

Bsc.	Master	Master Track	PDEng
Data Science (Joint Degree)	AI Engineering Systems	AI Engineering Systems	Data Science
	Data Science & AI	Data Science in Engineering	
	Data Science and Entrepreneurship	Smart Mobility Data Science and Analytics	

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

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Key Research Institute for AI

EAISI Institute - Health Research

World class Research: The Eindhoven Artificial Intelligence Systems Institute (EAISI) is the institute of Eindhoven University of Technology in the field of artificial intelligence (AI).

OBJECTIVES

The Eindhoven AI Systems Institute combines all TU/e Artificial Intelligence activities. Top researchers from various research groups work together to create new and exciting AI methodologies and applications with a direct impact on the real world.

HEALTH FOCUS AREAS

- Improved diagnostics
- Personalized and wearable health systems
- Better understanding of personal health states
- Preventive health management.

COLLABORATION WITH INDUSTRY

Building on the traditionally close ties of TU/e with industry, EAISI is partnering with a number of leading companies and organizations, both at a regional, national and European level. These include among others: ASML Philips Healthcare, NXP Brainport Eindhoven AI NL Coalition 4TU.Federation EuroTech.

EAISI
EINDHOVEN AI SYSTEMS INSTITUTE

TU/e

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E/MTIC AI Research Lab

ICAI Lab

The e/MTIC AI Lab, is aimed at **improving personalized treatment** by having **AI** work in close collaboration with the clinical staff and MedTech industries since AI is better able to make reliable decisions in a wide range of healthcare situations.

RESEARCH FOCUS

- **Imaging:** strongly enhanced Ultrasound, MRI and CT imaging by embedding task-adaptive AI across the imaging chain
- **Patient Monitoring:** strongly enhanced monitoring of vital signs both in clinical and in extramural settings
- **Clinical decision support systems:** Use AI to combine various data streams (e.g. EMR, images, spot checks) to produce explainable and patient-specific advice, early warning and alarms.

PARTNERS

- Eindhoven AI Systems Institute (EAISI)
- Máxima MC
- Catharina Ziekenhuis
- Philips
- Kempenhaeghe

e/MTIC
Eindhoven MedTech Innovation Center

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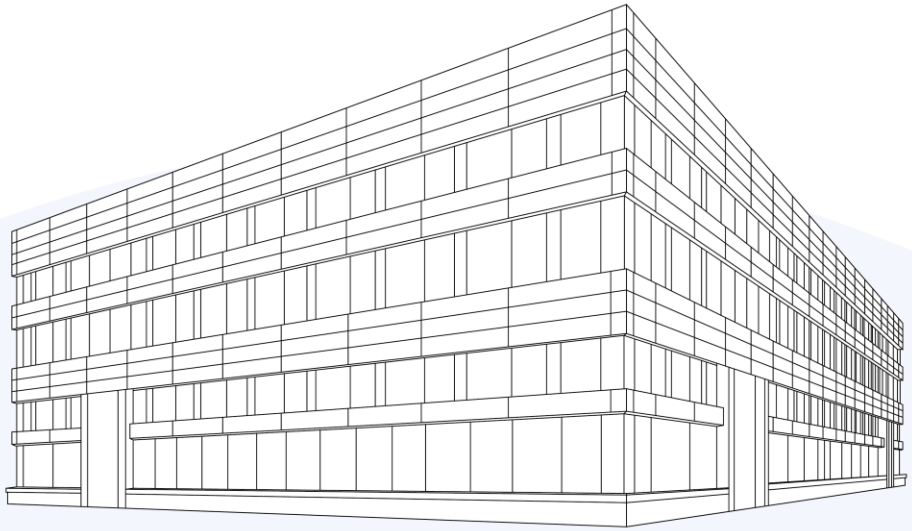
Quality Research Institutes

Holst Centre



High-quality medical data on demand to manage our health

R&D institute that develops generic technologies and technology platforms for **Wireless sensor technologies and flexible electronics.** Holst is specialized in technologies such as**; Hybrid printed Electronics**, **Thin Film Technologies** and **Sensor Technologies.**

SMART HEALTH APPLICATIONS

- **Health Patches:** on-body monitoring solutions such as: bandages, clothing or dedicated patches with printed electronics and made from bio-compatible materials.
- **Non-contact sensing:** invisibly embedded sensors into objects around users such as a bed that monitors vital signs or sleeping position.
- **Smart Clothing:** a "mix and match" platform of thin, stretchable and washable printed electronics technologies. Alowing a wide range of sensors and actuators – including ECG and bioimpedance electrodes, LEDs, solar cells and temperature, oxygen saturation, strain and motion sensors – to be combined and manufactured together.
- **Medical imaging:** thin-film technologies for various medical imaging modalities. For example: flexible X-ray detectors, visible & near infrared light sensors and flexible, large-area ultrasound-on-foil technology.

OPERATED BY

- IMEC
- TNO

Holst Centre
Open Innovation by imec and TNO

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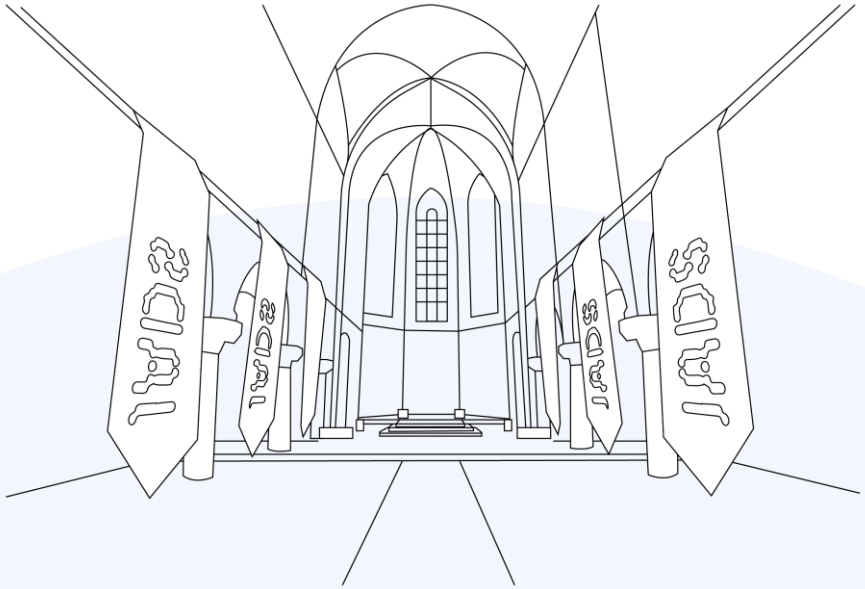

Key University

Jheronimus Academy of Data Science (JADS)

Data Science is essential to finding answers to today's challenges in the world.
JADS offers data science bachelor and master programs, PDEng education, professional education and help organizations shape their data driven future.

OBJECTIVES

The mission of JADS is to understand and use the value of data for solving complex societal and business challenges. The Life Sciences & Health industry is a Priority Industry to JADS, given that linking Life Sciences & Health to high tech by means of data communication, big data processing and artificial intelligence (AI) is one of society's challenges when it comes to sustainably feeding the world's growing population.

THE JADS DISCIPLINES

- Data Analytics
- Data Governance
- Data Entrepreneurship

KPN RESPONSIBLE AI LAB

The goal of the Responsible AI Lab is to develop transparent, privacy aware, and personalized AI solutions for businesses. Students work in the lab on projects contributing to the technical and legal aspects of transparency, on data engineering approaches that ensure privacy-by-design, on personalized and responsible offerings through text analytics and responsible up-lift modelling.

Jheronimus Academy of Data Science (JADS)

At JADS, researchers and students work closely with the business community. In addition to education and research, JADS also offers space for innovative, data-driven entrepreneurship and public-private partnerships.

JADS Jheronimus Academy of Data Science

Key University

Fontys University of Applied Sciences

The Fontys University of Applied Sciences has campuses in Eindhoven, Tilburg, Den Bosch, Helmond, and Veghel and focuses on five research topics:

- High-tech Systems & Materials
- Smart Society
- **Health**
- Learning Society
- Creative Economy

AI & Data Science is integrated in all research areas of Fontys.

BIG DATA CENTER OF EXPERTISE

At the Centre of Expertise Big Data, Fontys focuses on adding value to extensive, complex, and dynamic collections of data.

The Center of expertise has its own **Big Data Lab.** The lab acts as a meeting place for data-driven service innovation. The Lab provides a practice-oriented learning environment for students, teachers, and professionals. The lab is also available for companies and organizations and for conducting research and high-quality experiments with large data sets.

FONTYS ICT INNOVATION LAB

In the Fontys ICT InnovationLab, students, lecturers, researchers and business professionals work together on applied research and the development of tomorrow's ICT solutions.

Focus:
AI & Big Data, Interaction Design, Embedded Software, Virtual & Augmented Reality, Game Design, Cyber Security, Blockchain etc.

Fontys
University of Applied Sciences

BRABANT IS BRIGHT

Key University

Tilburg University

AI & Data Science plays a role in providing better and more efficient responses to major issues. Tilburg University's strength is that it illuminates these issues from various angles. The university combines expertise in AI & Data Science with expertise in people and society.

DATA SCIENCE CENTER TILBURG

The Data Science Center Tilburg (DSC/t) brings together Tilburg University's scientific expertise in economics, management, law, social sciences, behavioral sciences, and the humanities to develop and apply data science.

TILBURG UNIVERSITY ARTIFICIAL INTELLIGENCE SPECIAL INTEREST GROUP

A wide variety of scientists are involved in AI at Tilburg University. The TAISIG pools and strengthens AI activities and accelerates the development of new research proposals and grant applications. The TAISIG is active in regional and national networks.

DATA SCIENCE RESEARCH FOCUS - HEALTH ANALYTICS

- Real-time data from smart healthcare devices
- Smartness in medical services:
- Smarter healthcare cloud applications

AI FOCUS - HEALTH AND CARE

- medical imaging,
- patient analysis,
- personalized care

Bsc.	Master
Data Science (Joint Degree)	Data Science and Society
Cognitive Science and Artificial Intelligence	Cognitive Science and Artificial Intelligence
	Economics: Data Science
	Data Science an Entrepreneurship (Joint Degree)
	Data and Digital Society

TILBURG UNIVERSITY

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Key R&D facility

5G Hub

The 5G hub acts as a **Research and development facility**. The Hub also acts as a "**technology community**" where companies come together to experience and be inspired by the recent innovations.

FUTUR OF HEALTH: CONNECTING NEW TECHNOLOGIES TO THE HEALTH SECTOR

Example case from the HUB: The Connected ambulance
Health experts can help the patient from a distance and safe lives in this precious time. 5G offers the possibility for remote diagnosis using detailed images and video streams that are send over the network, of telemedicine and remote monitoring technology.

Faster network speeds and lower latency means more and better service and applications.

FOCUS TECHNOLOGIES

- 5G
- Artificial intelligence
- Virtual reality
- Augmented reality
- Blockchain
- Photonics

ACTIVITIES

- Develop
- Test
- Demonstrate (inspire)
- Network

POWERED BY

- Vodafone
- Ericsson

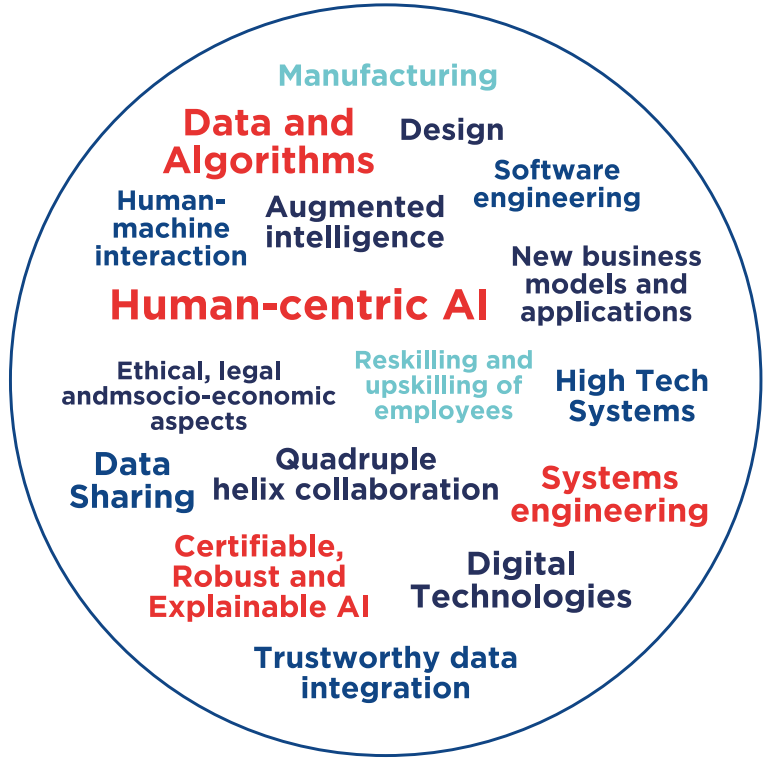
5G HUB
CONNECTING NEW TECHNOLOGIES

BRABANT IS BRIGHT

One network for Medtech AI

Regional network for AI in the whole region to strengthen and connect activities around Artificial Intelligence (AI):
The AI-hub encompasses the AI ecosystem in Brabant. The AI-hub brings companies, education and knowledge institutes, and public organizations in the province of Brabant together to strengthen and connect activities revolving around artificial intelligence (AI).

The goal is to extend the existing partnerships in the field of AI and the cross-over with (professional) education, societal challenges and joint support for start-ups, scale-ups and SMEs. The AI-hub Brainport is part of the national AI program developed by the Dutch AI Coalition (NL AIC).



PARTNERS

Part of the hub are industry, educational and governmental partners and campuses:

INNOVATION CENTER BRAINPORT · BOM · BRAINPORT EINDHOVEN · Brainport Industries · Fontys · JADS Jheronimus Academy of Data Science · Tilburg University · TNO innovation for life · TU/e EAISI

AI-hub BRAINPORT

BRABANT IS BRIGHT

Showcase

PHILIPS Health Care

World Class Research: Philips is advancing digital healthcare by connecting people, technology and data, helping to increase hospital patient and staff satisfaction while decreasing overall cost of care.

AI AT PHILIPS HEALTHCARE

At Philips, they believe the value of AI is only as strong as the human experience it supports. That's why Philips combine the power of AI with deep clinical knowledge to create solutions that integrate into the workflows of healthcare providers and people's daily health routines – supporting them at every stage of the health continuum.

THE AI-ENABLED DOMAINS AT PHILIPS

- Diagnosis and treatment
- Connected care
- Personal health

"AI allows us to see more than we ever could with our own eyes. For AI to have a meaningful impact on patient care, it needs to go hand in hand with robust scientific insights and deep clinical knowledge."

HENK VAN HOUTEN

Chief Technology Officer

BRABANT IS BRIGHT

Showcase

Bambi Belt

WIRELESS MONITORING

Bambi Belt is a skin-friendly, wireless neonatal vital sign monitoring system. It accomplishes the same functions as wired adhesive electrode systems currently implemented in NICUs. A disposable belt functions by being wrapped around baby's chest. Sensors integrated inside Bambi Belt measure critical data in a nonintrusive way, while Bambi Bridge sends the captured data to Bambi Monitor.

BUSINESS IN BRABANT

Bambi Medical is located at the High Tech Campus in Eindhoven. The development of Bambi Medical took place in a collaborative model with important stakeholders like Holst Centre, the Province of Brabant and the Ministry of Economic Affairs and Climate.

"Our solution works either stand-alone or in combination with existing patent monitors within the hospital infrastructure. As a result, non sticky texture of the belt eliminates pain and stress of babies."

Bambi Medical