The University of Twente is the ultimate *people first* university of technology, which translates into our vision for Social-embedded AI: **People First Artificial Intelligence*.**

We see Social-embedded AI as intelligent solutions for complex human tasks that range from highly autonomous to decision-making support systems. We believe that hybrid intelligence needs to be designed and implemented by following a holistic systems perspective that aims to provide robust, resilient and sustainable solutions that should be respectful of our societal values and to ensure high quality in terms of accessibility, trust, safety and experience of use for all the individuals. To serve this need, within the UT we adopted an integrated multidisciplinary approach to Hybrid AI that is focused on continuous collaborations between **designers, engineers, experts of health and well-being** and **social scientists** to ensure a feedforward loop which is essential for successful Social-embedded Social-embedded AI. Following this multidisciplinary perspective innovators at UT are supported by, and work together with, teams of computer and data scientists, engineers and human factors researchers, as well as healthcare, cognitive, behavioral, business and philosophy scientists to:

- explore and model the *ethical, environmental, social, psychological and economic implications* of intelligent agents;
- develop novel techniques for *assessing pro-actively and implementing trustworthy, reliable, useful and acceptable AI* systems that can bring value to humans and society.
- define new *business models* to feed the loop and to establish the impact of current and future AI solutions.

The UT sees itself as a gatekeeper of *responsible design of AI*. How to design and how to systematically assess the impact of AI on people and communities is the primary goal of our scientists to build the future in which human and AI work together in an accountable, transparent, efficient, effective and pleasant way.

Scientists at the UT believe that to design AI in a responsible way means to develop solutions able to work 'with you' instead of 'for you'. Therefore, AI solutions should be designed to maximize reliability, resilience and trustworthiness during the interaction to support high quality in the experience and in the decision making, without being invasive, demanding and disruptive for people.

Our vision on the responsible design of AI translates into research to **define frameworks, guidelines and rules to enable humans and AI to coexist and complement each other**, such that AI supports people in a personalized way that corresponds with how people want to live their lives. Our learnings behind responsible AI, need for trust and commitment, and quality of interaction between humans and technology will define the new era of AI.

The next level within AI-technology is bringing the artificial intelligence ***closer to the application***. Morden Machine Learning often leans on enormous amounts of training data and transferring these raw data from the sensor to a central server far away can prove to be sub-optimal. The next big steps for AI would be learning from small amount of data, and go beyond standard supervised learning paradigm towards unsupervised/self-supervised representation learning and exploration of multi-modal learning.

The technology will also be more efficient if parts of this processing and adaptive learning already take place locally: close to, or even *within* the sensor. This asks for a thorough knowledge of not only the physical properties of these sensory data but also for an ingenious way of designing the underlying hardware. Special algorithms and architectures need to be designed to bring the cyber

aspects of the system in concordance with the dedicated hardware, taking the overall context in mind.

This *integrated* view on Technical-embedded AI needs an equally multi-disciplinary approach: physicists, mathematicians, engineers and social scientists all working together to ensure that the smartness built in the devices is both efficient, robust and secure. Since long, this *integrated and inclusive approach* forms the core business of the University of Twente, founded as a university for the region and thus geared towards

Technical-embedded AI will find its application in almost every technical and societal domain, including health, smart robots and smart sensing for sustainable development goals.