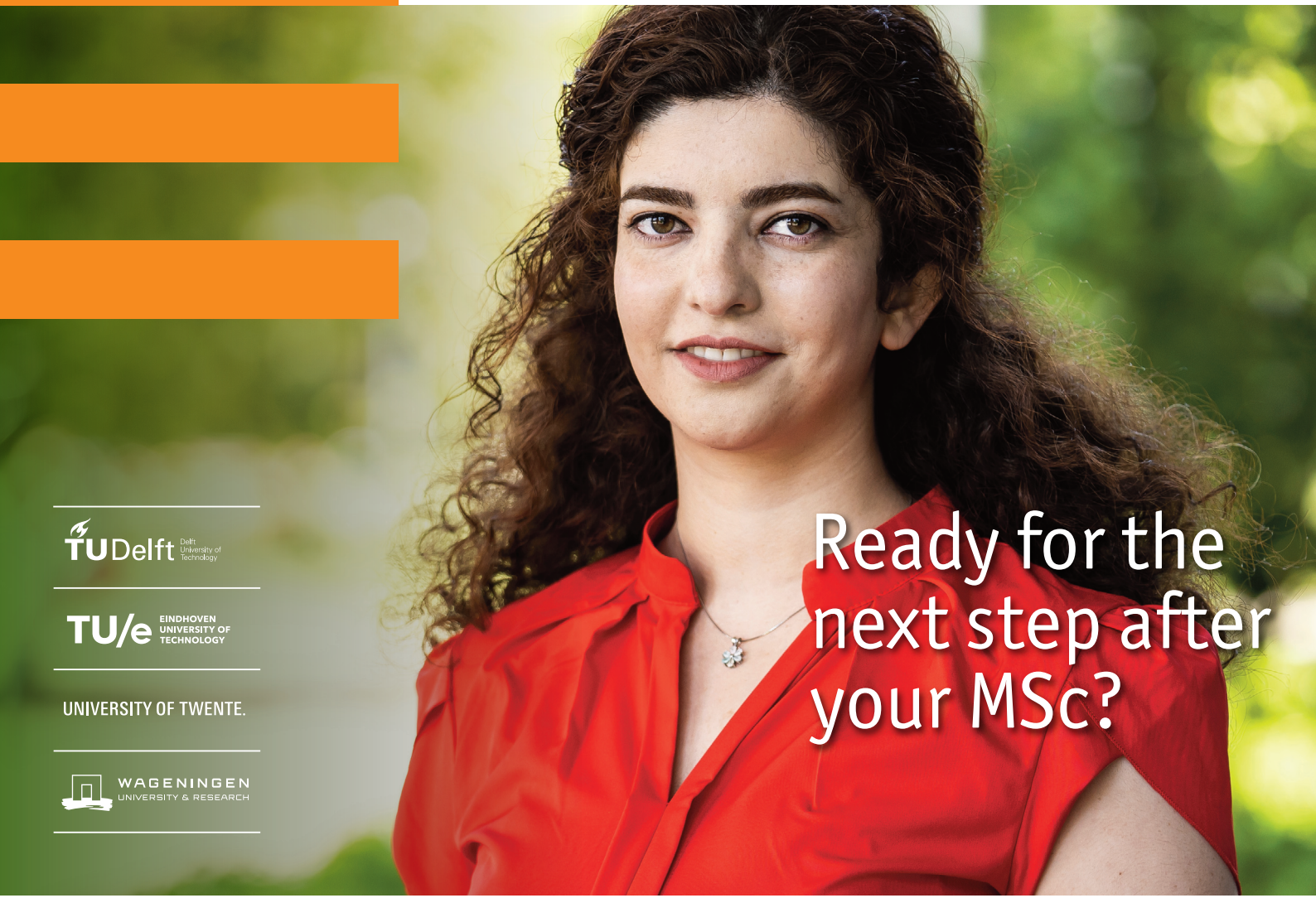
Doctorate programmes Engineering



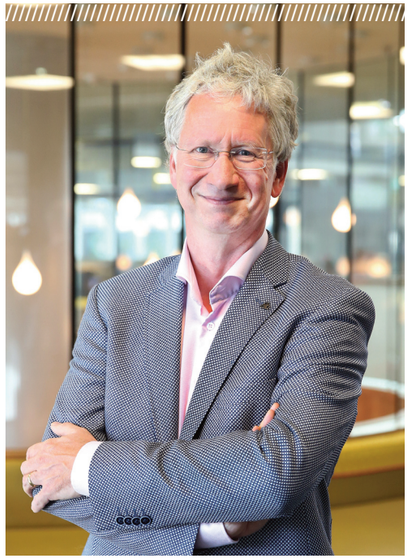
TU Delft Delft University of Technology

TU/e Eindhoven University of Technology

University of Twente.

Wageningen University & Research

4TU.School for Technological Design STAN ACKERMANS INSTITUTE



“Are you ready?”

The two-year post-MSc programmes of 4TU.School for Technological Design, Stan Ackermans Institute, can become your passport to a faster successful career in industry or business. This passport is the degree Engineering Doctorate (EngD) which you will be awarded upon the successful completion of the programme.

Innovation is the driving force behind the high-tech industry. Close collaboration between industry and universities is crucial for innovation. For this we need excellent engineers.
Our technological designer programmes train the most talented master graduates, engineers who want to further develop their skills in the field of technological design and who want to contribute to the needs of the high-tech industry by developing innovative solutions.

As you become an employee of one of our universities of technology in the Netherlands, you combine learning and earning throughout the programme. During the design project, which is done in and for industry and often takes place in the second year, you demonstrate your ability to apply your theoretical knowledge in solving a real-life, complex design problem. Many of our graduated EngD trainees joined the company where they carried out their design assignment and now fulfill management positions.

Are you ready to join our EngD community and boost your career?

Prof.dr Paul Koenraad
Director 4TU.School for Technological Design,
Stan Ackermans Institute

Switch PDEng to EngD

On September 1, 2022, the name of the Professional Doctorate in Engineering (PDEng) degree changed to Engineering Doctorate (EngD). Because the Dutch Universities of Applied Sciences start with Professional Doctorate programs as well, and we want to keep the distinction clear, the name of the degree is changed.

Professor Stan Ackermans, PhD

Professor Stan Ackermans, PhD, (1936-1995), professor and rector at TU/e, championed the introduction of the design educational programmes. Following his death, the institute was renamed Stan Ackermans Institute in his honor. Since 2006 it’s called 4TU.School for Technological Design, Stan Ackermans Institute.

Boost your career!

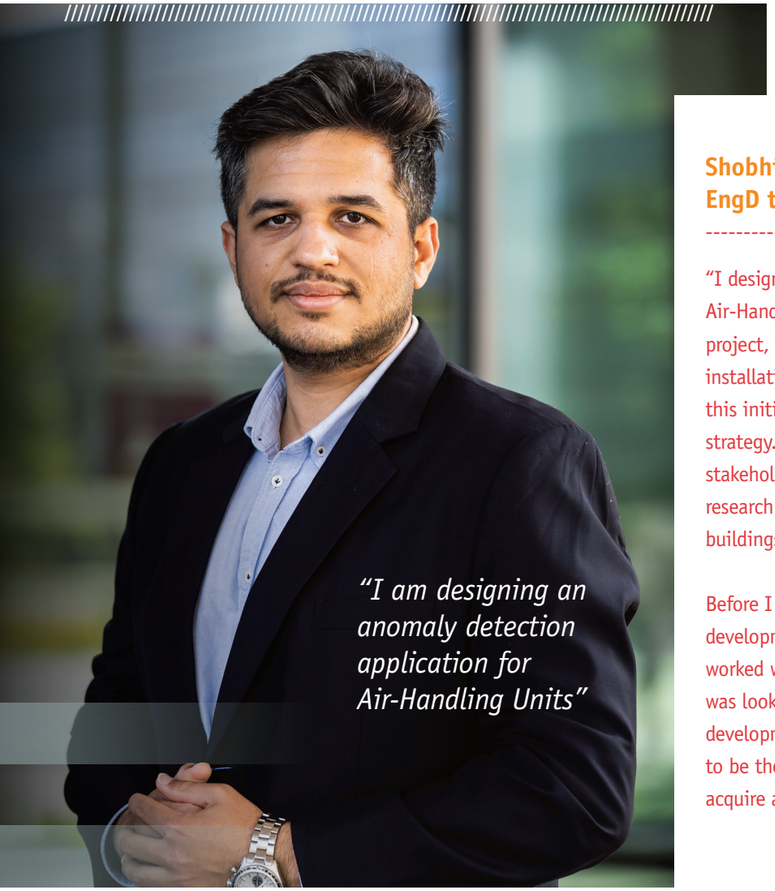
Are you a graduated young professional or currently completing your Master of Science programme at a (technological) university? Are you looking for an even faster successful career in industry or business? Then you should consider applying to one of our 2-year training programmes (with salary) and become a technological designer at the 4TU.School for Technological Design, Stan Ackermans Institute.

Two-year programmes

The Dutch universities of technology - TU Delft, Eindhoven University of Technology, University of Twente and Wageningen University & Research - offer two-year programmes that will put you on a faster track to a successful career in industry. In addition to broadening your technological expertise, you will learn more professional skills that will enhance your career opportunities. It is a paid position; you become an employee of the university. Industry offers graduated designers from our programmes excellent jobs, because of the strong reputation of our graduates.

High-tech industry

The technological designer programmes were initiated at the request of the Dutch high-tech industry. High-tech companies need professionals who can design and develop complex new products and processes and offer innovative solutions. All programmes work closely together with high-tech industry, offering you the opportunity to participate in large-scale, interdisciplinary design projects. With this unique cooperation we provide you with a valuable network of contacts in industry. Over the past twenty-five years more than 4,500 of our graduates have found challenging and exciting jobs with (multi)-national companies, including Philips, ASML, Thermo Fisher Scientific, Sabic, Shell and TNO. These companies are united in their praise for the quality of the technological designer programmes and their graduates, and offer them a faster track in their career. To ensure their continued enthusiasm, the programmes employ a strict selection process, accepting only excellent young professionals and graduates.



Shobhit Chitkara,
EngD trainee Smart Buildings & Cities

“I design an anomaly detection application for Air-Handling Units. The industry partner on the project, Kropman B.V. is one of the largest building’s installations company in the Netherlands. They value this initiative as key to their digital transformation strategy. I find myself closely collaborating with stakeholders from industry, academia, and public research institutions to prevent energy wastage in buildings and lower carbon emissions.

Before I joined the EngD programme, I led business development for IoT startups in Mumbai. Having worked with product teams on several projects, I was looking for an opportunity to experience its development hands-on. I found the EngD programme to be the right vehicle for this leap. It has helped me acquire and combine skills from several disciplines.“

4TU. School for Technological Design, **Stan Ackermans Institute**

As part of their increasing intensive cooperation, the Dutch universities of technology decided in 2006 to combine their technological designer programmes in the 4TU.School for Technological Design, Stan Ackermans Institute.

4TU technological designer programmes

The 4TU technological designer programmes offer you an opportunity to enhance your expertise and project management skills with an extensive hands-on assignment, supervised by experienced professionals. Each programme covers a different technological field, for example managing complex architectural construction projects, designing efficient and effective maintenance processes from a multidisciplinary perspective, developing high-tech software systems for software-intensive systems. The focus of each programme is described further on in this brochure.

Engineering Doctorate

The two-year, full-time programmes all lead to an Engineering Docorate (EngD) degree. If you are accepted into one of the programmes, you are appointed as a trainee for the duration of two years and receive a salary. Nearly all technological designer programmes are taught in English (exceptions: QME and CI). The structure of all programmes is basically the same: during the first part of the programme you gain extensive knowledge and experience of the latest design methods and their applications. You also learn to work in interdisciplinary teams and further develop your professional skills. You apply what you have learned during the second part of the programme, when you design an innovative industrial product or process for one of many prominent high-tech companies. The close cooperation between these companies and the technological designer programmes offers exciting career opportunities.

Programmes and tracks

Location
TU Delft

Bioprocess Engineering (BPE)
In the BPE programme, trainees are trained as a multidisciplinary team expert with a strong background in Biosciences and Engineering subjects required for innovative bioprocess design.

Civil and Environmental Engineering (CEE)
The faculty of Civil Engineering and Geosciences of TU Delft has developed an EngD programme in two tracks:
Sanitary & Environmental Engineering focuses on water management issues related to health technology, such as water collection, water and sanitation, environment and water transportation.
Structural & Railway Engineering is aimed at innovation in civil engineering, for example smart buildings, new materials and sustainable railways.

Process and Equipment Design (PED)
The PED programme trains MSc graduates to become qualified designers capable of designing 'fit for purpose' and 'first of a kind' (chemical) products, processes, equipment and devices. It encourages trainees to actively look beyond the boundaries of their own discipline, and to creatively aim for ingenious design solutions demanded by society. The programme Chemical Product Design is integrated in PED.

Location
Eindhoven University of Technology

Automotive Systems Design (ASD)/ Mechatronic Systems Design (MSD)
ASD focuses on systems architecture and design for modern high-tech automotive systems in the context of Smart Mobility. The programme aims at a systems approach to problems around mobility and fuel efficient automotive systems, including communication systems and electrical driving, with emphasis on the multidisciplinary design aspects of project-based research and engineering and the challenges that are faced by the automotive industry.
The MSD programme aims at system synthesis and design of complex equipment, instruments, robotic and manufacturing systems and systems-of-systems, by combining in-depth understanding of the classical engineering fields, with multi-disciplinary, model based systems engineering to conceive, predict and verify cutting-edge system functionalities and architecture. The programme is closely connected to the TU/e High Tech Systems Center. Officially MSD is positioned as a sub-track of ASD. After successfully completing the programme, you will receive a diploma of ASD mentioning that you specialized in MSD.

Clinical Informatics (CI)
The Clinical Informatics programme is geared towards the design of information systems in healthcare. IT knowledge, but also knowledge of clinical and business processes are crucial to the design of optimal solutions, which really support the professionals in healthcare. The programme is carried out in close cooperation with hospitals and other care institutions all over the Netherlands. All trainees in the programme are required to be fluent in Dutch.

Data Science (DS)
Data Science is concerned with the problem of finding patterns and creating value from vast streams of data in the context of a data domain. The programme combines statistics, computer science, mathematics, and design theory with the discernment to explore data sets, gather insights, visualize results, and communicate meaningful findings to stakeholders taking into consideration underlying ethical and legal aspects.

Design of Electrical Engineering Systems (DEES)

Track: Healthcare Systems Design(HSD)
Healthcare industry requires a new generation of professional designers who can design new prototypes of healthcare systems or well-being devices within multidisciplinary teams. The HSD trainees develop in-depth understanding of the technical and user requirements in the health domain so that they are able to bridge the gap between high-tech technology and the health area.

Track: Information and Communication Technology (ICT)
The ICT programme trains designers in specifying, designing, building, testing and evaluating complex multidisciplinary systems in the domain of information and communication technology. The design of innovative consumer products and professional systems that communicate with their (global) environment (e.g. wireless and electro-optical communication) is extremely challenging. This leads to many new solutions, for example embedded software, monolithic integrated (opto-) electronic circuits in the field of telecommunication, medical applications and consumer products.

Designing Human-System Interaction (HSI)
The mission of the new HSI programme is to train professionals to develop competences in designing and evaluating interactive intelligent and innovative systems, services, and products. The HSI programme pays special attention to the frontier of the complex systems enabled by artificial intelligence, data science and other emerging technologies in high-tech systems, health applications and smart mobility, and its impact on individuals, organizations, and society. The goal is to ensure positive user experiences that support their values and needs.

Process and Product Design (PPD)
The chemical, food and polymer producing industry demand for an integrated approach of the disciplines chemical engineering, applied physics, mechanical engineering and technology management. PPD focuses not only on process design, but also on the design of novel products. The relationship between the production process and product properties like e.g. functionality and microstructure is the connecting thread in the PPD programme.

Qualified Medical Engineer (QME)
The Qualified Medical Engineer programme trains engineers to become effective designers in the clinical environment. Of course, engineering skills and knowledge of physiology are relevant. But also communication with health care professionals (and patients) is crucial to really get clear what their needs are and to determine how technology can improve patient care. The programme is carried out in close cooperation with hospitals and other care institutions all over the Netherlands. All trainees in the programme are required to be fluent in Dutch.

Smart Buildings and Cities (SB&C)
SB&C trainees are capable of integrating state-of-the-art technology through an integral design process, resulting in innovation for smart energy systems for the built environment. From different backgrounds, a SB&C trainee contributes to the development of intelligent, energy efficient building components, building designs and urban plans aimed at intelligent reduction, supply and demand of energy with added value for the user.

Software Technology (ST)
The development of software for advanced systems has many different aspects. The ST programme focuses on the project-based design and development of software for software- and data-intensive systems from the High Tech Industry. The trainees get acquainted with the important concepts from diverse knowledge domains such as Data Science, Model Driven Engineering and Networked Embedded Systems, and learn how to use these to solve the actual industrial problems that our industry partners present to us.

Location
University of Twente

Business & IT (BIT)
The Professional Doctorate in Engineering in Business and IT (EngD) aims to raise the level of competence of professionals in IT to deal with the opportunities and challenges that IT-based innovations pose.

Technology is changing fast, and professionals need to keep themselves up-to-date. At the same time, some of the problems of business-IT misalignment, legacy software and global cooperation are persistent. Modern IT professionals need to work in multidisciplinary teams to manage these problems. The mission of the BIT EngD programme is to deliver professionals who are able to understand and design robust and economically sustainable IT-enabled networks, such as social networks, online markets, business networks and public service networks, which balance economic opportunities and online IT risks to attain business goals.

Civil Engineering (CE)
Industry asks for highly qualified designers in the field of civil engineering, with knowledge of the different technical and nontechnical aspects of actual civil engineering issues (such as economics, policy, law and business administration, but also knowledge on project and process management). These designers need to have the skills to play a key role in multidisciplinary design teams that are concerned with solving these complex issues.

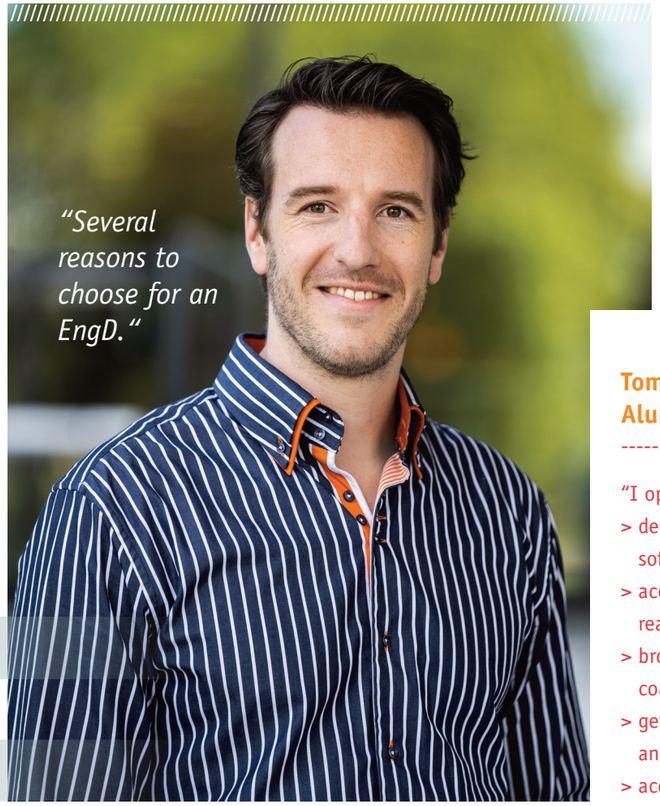
Energy and Process technology (EPT)
The technological designer in the field of EPT creates innovative technical solutions for products and processes in the nutrition, energy and process industry. For this purpose a multidisciplinary approach is required starting from functional and market requirements with an accent on quality, environment, safety, sustainability and recycling. Besides deepening and broadening of knowledge during the whole EngD programme in EPT, several assignments in industry will be carried out.

Maintenance (M)
The EngD programme Maintenance educates designers who create efficient and effective maintenance processes from a multidisciplinary perspective. The design has to comply to technical, financial, logistics and organizational specifications. A sound understanding of the physical mechanisms is key, as the basis for failing systems and components is in nature physical. By addressing both technical and operations aspects during the programme, a necessary link is established between these two fields of expertise.

Robotics (R)
The technological designer in Robotics creates innovative robotic solutions for medical, industrial and safety purposes, such as rehabilitation robotics, welding robots, and independently operating robots performing inspection tasks. Therefor a multi-disciplinary approach is required with components from mechanical, electrical, computer and control engineering. The EngD programme in Robotics allows the trainee to deepen and broaden their knowledge and to gain advanced application experience through a challenging assignment in industry.

Location
Wageningen University & Research

Design for AgriFood and Ecological Systems (DAES)
DAES trainees will be able to create high-value, creative, and innovative designs to improve sustainability in an independent and multi/ interdisciplinary way under the supervision of the university and experts outside academia. The final result will be a design that will, directly or indirectly, contribute to increasing the sustainability of agri- or horticulture, livestock farming, or the living environment in general.



Tom Vrancken,
Alumnus EngD Software Technology

“I opted for an EngD to
> deepen my knowledge and skills about software architecture and design
> acquire practical experience with complex real-world technical problems in industry
> broaden my skill set with management and coaching skills
> get trained by experts from both academia and industry
> acquire experience with multidisciplinary and multicultural teams.”

Application, selection and degree

Application

Application to an EngD programme is open to university graduates from the Netherlands and other countries. You will at least need a Master of Science degree or equivalent, preferably in the exact sciences. There will be an assessment and selection procedure before you can enter the programme. The programmes of the Stan Ackermans Institute use strict selection criteria to ensure the required high quality. Excellent marks, motivation and a design-oriented attitude are vitally important. You should also have an excellent command of the English language.

Selection

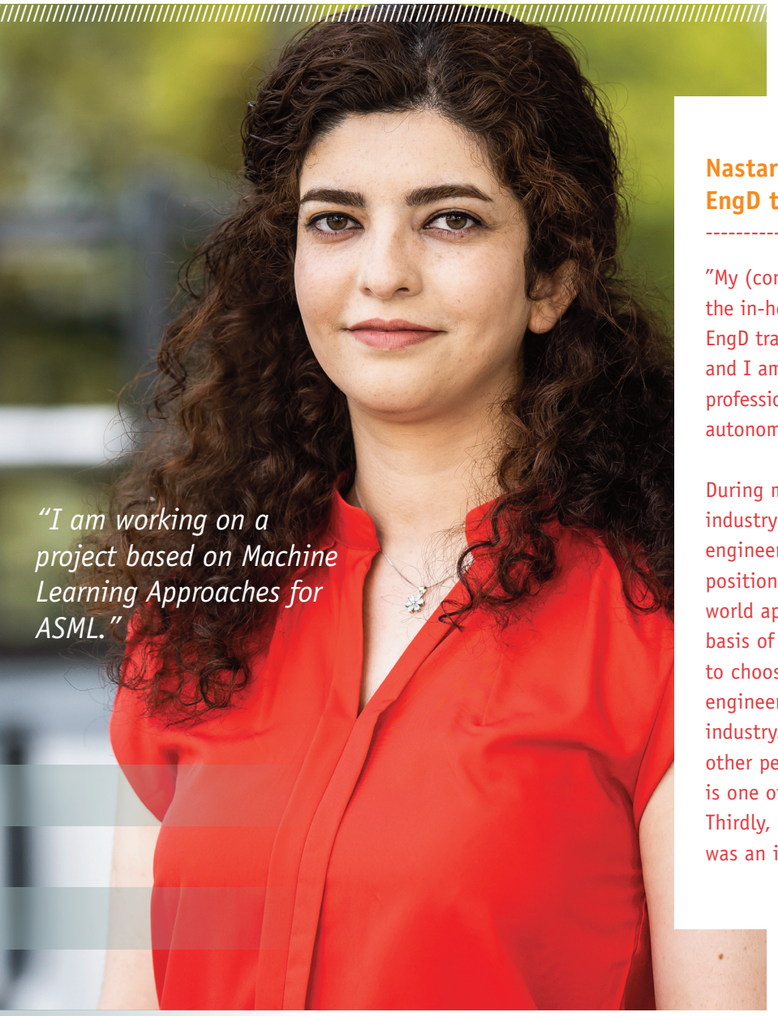
You can apply by sending your letter of application with a complete curriculum vitae and at least two letters of recommendation (in English). Suitable candidates will be invited for an interview with the selection committee of the relevant programme. Please note that each programme has different starting dates, as well as its own specific admission requirements and selection procedure. The exact requirements and selection procedure for each programme are listed on www.4tu.nl/sai. Click on ‘education’ and visit the individual website of the programme. You can also contact the coordinator of the programme.

Appointment

If you are selected for the programme, you are appointed as a trainee for the duration of the programme, up to two years. You are a member of the scientific staff and receive a salary in accordance with government regulations. Because you are a trainee, you do not have to pay a tuition fee.

Diploma and degree

On successfully completing the programme, you will receive a certified diploma. You are entitled to use the academic degree Engineering Doctorate (EngD degree) and are registered as a Technological Designer in the Dutch register kept by the Royal Institution of Engineers in the Netherlands (KIVI).
The quality of the programmes is assured by an assessment and certification procedure on behalf of the Dutch Certification Committee for Courses to become Technological Designer (CCTO, Nederlandse Certificatie Commissie voor Opleidingen tot Technologisch Ontwerper).



Nastaran Bajalan, EngD trainee Software Technology

”My (confidential) project is closely related to the in-house projects I did in my first year as an EngD trainee. I am working at ASML for 10 months and I am happy to work in a in a bigger team of professionals in the field, while having the autonomy of working on the specific tasks.

During my master’s in Iran, I was working in the industry as a full-stack developer and software engineer. Comparing the research and the job positions I would like to see the results in real-world applications rather than researching the basis of the field. So the important factor for me to choose an EngD was to advance my software engineering knowledge while being a part of the industry. Secondly, I wanted to work more with other people and improve on my soft skills which is one of the main focus areas in EngD programs. Thirdly, the fact that an EngD traineeship is paid, was an important motive.”

Universities of technology in the Netherlands

4TU

www.4TU.nl

The four leading universities of technology in the Netherlands - TU Delft, Eindhoven University of Technology, the University of Twente and Wageningen University & Research have joined forces in the 4TU.Federation. This federation maximizes innovation by combining and concentrating the strengths of all four universities in research, education and knowledge transfer.

The Association of Engineering Doctorates (AEngD)

The Stan Ackermans Institute is an affiliate member of the Association of Engineering Doctorates (AEngD) – the UK-based organisation which promotes the value of the Engineering Doctorate (EngD) to government, industry and commerce. The affiliation between Stan Ackermans Institute and AEngD establishes a wider and more strategic industrial research collaboration and builds international links across the engineering research community.

TU Delft

www.tudelft.nl

TU Delft (TUD) is an entrepreneurial university at the forefront of technological development. As such it is constantly involved in furthering technological advances in the interests of society. By means of its fundamental and applied research and educational programmes, TU Delft trains the engineers of tomorrow.

Eindhoven University of Technology

www.tue.nl

Eindhoven University of Technology (TU/e), founded in 1956, is a research-driven, design oriented university of technology, with the primary objective of providing young people with an academic education within the engineering science & technology domain.

University of Twente

www.utwente.nl

University of Twente (UT), founded in 1961, is one of Europe’s finest educational resources encouraging research and entrepreneurship in both technology and social sciences. A young and innovative institute, UT is internationally respected in areas ranging from public policy studies and applied physics to biomedical technology.

Wageningen University & Research

www.wur.nl

Wageningen University & Research is the only university in the Netherlands to focus specifically on the theme ‘healthy food and living environment’. We do so by working closely together with governments and the business community.

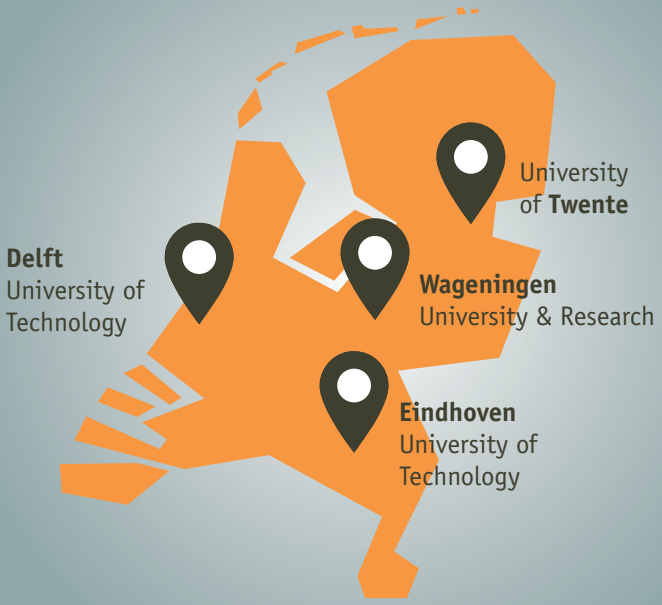
The 4TU.School for Technological Design, Stan Ackermans Institute offers two-year post-master technological designer programmes.

The institute is a joint initiative of the four universities of technology in the Netherlands:

TU Delft,
Eindhoven University of Technology,
University of Twente and Wageningen University & Research.

sai@4tu.nl

www.4tu.nl/sai



Photography by Vincent van den Hoogen