FOCUS ON IMPACT
Impact Congress

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Public lectures about robotization

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During this exhibition, Tilburg University organized six public lectures in which different disciplines focused on the effects of robotization and digitalization on people and society.

Impact PhD Program

The Impact PhD Program stimulates collaboration amongst the Tilburg University Schools. As a result, thirteen PhD candidates from different disciplines started research projects within the three impact themes in 2018 and 2019.

Hack for Future Talent

The Hack for Future Talent, organized on December 8, 2018, focused on issues such as how to achieve new insights into (good) education, talent optimization, and more equal opportunities for young people. The Hackathon also gave an impulse to a more data-driven and fact-based education policy.

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In 2018, the Digital Society research program was launched aiming to give the Netherlands a leading international role in the field of human-centered information technology with the task of finding solutions for global challenges. In this program, all Dutch universities have joined forces. Tilburg University is represented in four of the seven program lines: Citizenship & Democracy, Responsible Data Science, Health & Wellbeing, and Learning & Education.
Empowering the Resilient Society

Our society faces complex issues: markets and economies are globally interconnected, digital technology plays a profound role, climate change is influential, and ageing and migration are changing the composition and needs of the population. The consequences of these developments are difficult to predict and lead to great uncertainty for many people and groups. Resilient societies and resilient people are necessary to cope with this rapidly changing world and to anticipate future challenges.

A resilient society requires, among other things, new and innovative forms of governance and legislation, work and economy, sustainability, morality, and social cohesion. Empowering the Resilient Society is about strengthening our society with a view to the future, both at a national level and in districts and neighborhoods.

Enhancing Health and Wellbeing

Today's world is complex: full of distractions and short-term rewards. In addition, people have a longer life course, and the demand for care and welfare is increasing due to a growing number of chronically ill people. These current developments call for an affordable and sustainable care system that is primarily focused on health instead of illness. Individuals need to have the right skills to make long-term decisions about their health and to protect themselves from unhealthy external influences. This needs to be supported by personalized training and treatments that make use of e-health and data technology, among other things.

Enhancing Health and Wellbeing is focused on a multidisciplinary approach with knowledge of behavioral change, the organization and implementation of care, and the associated cost and legal aspects in order to make and maintain both individuals and organizations resilient.

Creating Value from Data

A large part of people’s behavior and of systems is recorded on a daily basis in large amounts of data, which can also be interlinked. The amount of data we produce increases exponentially, as does the computing power and efficiency of algorithms. This creates new opportunities to improve society but also threats, for example, in the area of privacy.

Creating Value from Data focuses on the improvement and application of data science techniques and on the enhancement of transparency, reliability, and fairness in the use of data. In order to achieve this, it is necessary to link different areas of expertise. Expertise in the field of algorithms, data mining, machine learning and analytics is linked to expertise in the fields of law, ethics, economics, logistics, labor market, and Human Resources. The objective is to apply this in projects that improve society and help to achieve the Sustainable Development Goals (SDGs).

Focus on Impact

Our society is more complex and diverse than ever and faces major challenges. Tilburg University’s Impact Program originates in the involvement of our researchers in these challenges. In order to advance society, knowledge and innovation are needed, both in a social and technological sense. Collaboration with knowledge institutions, social partners, businesses, and citizens is necessary in this respect. Education and knowledge institutions play an important role in this multi-helix approach. Moreover, they have a responsibility: we call it “science for society.” At the same time, “science for science” is needed: knowledge must constantly be developed, and science must become even more excellent. Stronger connections within science are an important prerequisite. This is why multidisciplinary research teams are jointly focusing on the many facets of our societal challenges.

Impact Program

The Impact Program, together with partners, creates an impact on society. By this, we mean that scientific research contributes to solutions for complex issues in society. How is this done? By building networks and communities to connect and collaborate on societal challenges. Together with our partners, we organize activities, such as debates, congresses, and exhibitions to bring stakeholders together and to share the results of collaboration. The Impact Team sets up programs and projects together with partners and raises funds to enable more research within three strategic themes: Empowering the Resilient Society, Enhancing Health and Wellbeing, and Creating Value from Data.

Researchers have the floor

In this Focus on Impact, we would like to let our researchers and partners have their say. They are best suited to explain what they get out of the various partnerships and how they make an impact. Many studies and researchers deserve a place in the limelight. We have selected nine fine examples of research with impact to give you a good, varied, and inspiring impression.

We hope you enjoy the read!

The Impact Team
JOIN: how can young people make society more resilient?

‘It’s a continuous interaction, with society itself as the end result’

How do you ensure that researchers study the topics society wants an answer to? Four years ago, this question was the start of the Dutch National Research Agenda (NWA). It yielded 25 research routes. With 5 subprojects within the route Towards Resilient Societies, Tilburg University is involved in the first program of the route: JOIN, Young People in a Resilient Society.

Utrecht University professor Bas van Bavel is the figurehead of the route. “The NWA offers researchers a framework within which they, together with societal parties, conduct research into relevant issues. The NWA wants to be complementary to existing schemes, which is why the NWA has chosen to set up this program as a stepping-stone to jointly examine an issue. Further research can then be developed using existing funding instruments.”

Resilient society
“Strengthening and exploiting society’s resilience is needed to address major issues such as energy transition, climate change, and sustainability. How can we ensure that society can cope with all these major issues? It is a continuous interaction, with the end result being society itself. The energy transition, for example, is not a technological goal in itself, but something that we want to achieve for the society of the future.”

JOIN
JOIN consists of five work packages. Within these packages, researchers will work on a variety of related topics in the area of youth and resilience. For example, Tranzo, together with partners, is developing a self-test to measure young people’s resilience. Tilburg University has also researched whether data science can be used to prevent young people from “becoming invisible” as in not being employed, in education, or training. In another project conducted together with the public prosecutor’s office in Breda, among others, it was researched how young people can experience the rule of law as more inclusive. In addition, the university is involved in research into young people and new forms of democracy, and in research on young disabled people, labor participation and inclusive organizations. The aim is to achieve results within two years.

Relevant research
“The relevance of biomedical and technological research is clear to everyone,” says Van Bavel. “But we are seeing more and more clearly that the social sciences and the humanities are needed to have a real impact on society. Often a great deal is technologically possible, but how are we going to make use of these possibilities? We have to deal with behavioral change, cultural patterns, and laws and regulations. Social sciences and humanities research is needed to achieve this.”

BAS VAN BAVEL

‘Often it is not about what can be done, but mostly about how to do it’
TNO and Tilburg University conduct research on intervention Back to work

‘Staying at home after illness is a societal problem’

Suppose you have a job and turn out to be seriously ill. In the early days, it is all about survival. How do you pick up your life and work after that? Often this turns out to be difficult, and people are unable or only partially able to get back to work. Together with TNO, Tranzo, the Tilburg University’s Scientific Center for Care and Wellbeing, is conducting research into an intervention to better guide cancer patients back to work.

“Work can provide support during illness”

‘Work is part of your identity, offers opportunities for growth, and provides financial security,” says researcher Margot Joosen. “We see that many cancer patients do not work during treatment and have little contact with their employers. After a year and a half at home, the pressure is high to reintegrate quickly. The fact that patients do not fully return or even lose their jobs is not only an individual but also a societal problem.”

Successful interventions combined

The intervention is developed in collaboration with ArboNed and Re-turn and consists of three modules: staff welfare officers open up the dialog, then work on skills and the development of belief in one’s own abilities, and then the return to work. Researcher Hanneke van der Meide: “Along the way we can refine the process so that, in the end, there is an intervention that is in line with practice.”

Health Impact Bond

For Tilburg University, professor Roland Blonk leads the project. ZonMw finances the research that consists of three substudies. “First, the effectiveness of the intervention is examined; second, what works for whom and in what context; and, finally, whether the financial method by which the intervention is funded, the Health Impact Bond, is effective. It is one of the first Health Impact Bonds in the Netherlands,” says Van der Meide. “How does it work? Income protection insurer the Amersfoortse initiates the project because it ultimately wants people to stay in employment as much as possible. ABN Amro and Start Foundation invest in the Health Impact Bond for societal reasons. If the intervention carried out by ArboNed turns out to be effective, and there is less absenteeism, this will yield money. This allows investors to recover part of their investment.”

Quality of life

“Although the intervention is mainly about quality of life, a positive financial result is a pleasant side effect,” the researcher emphasizes. Joosen: “And the ultimate goal is to learn from the research for other target groups, so that more employees with health problems can stay in employment.”

“We are flexible and can refine along the way so that in the end there is an intervention that is effective’
Climate and Energy Transition Community puts Tilburg University on the map

‘We feed the political and societal debate’

The climate: newspapers, social media, and political campaigns are full of it. Does the climate problem exist at all? How do we achieve climate and energy targets? What is required to change legislation, collaboration, behavior, and thinking? In 2017, the Community on Climate and Energy Transition was launched as part of Tilburg University’s Impact Program.

“Climate change and energy transition are themes in which many different disciplines play a role,” adds Saskia Lavrijssen, professor of economic regulation and governance of network industries. “Legislation, behavior, governance structure; it has an effect on whether or not the climate targets are achieved. That is why we need to look at these issues from all these disciplines. It’s a big, complex puzzle that we have to put together.”

Projects and partners

Scientists who are part of the Community work together in projects, among other things. For example, in SMILE, led by Groenleer, that deals with how to activate homeowners to make their homes energy-neutral. Proposals for new projects are under development. In view of the provincial elections, the Community also organized a well-attended election debate on climate and energy.

Explanation in the House of Representatives

The Community makes it easier to see where which expertise on climate and energy is located within the university. Groenleer: “It also shows society that this expertise is crucial in current political and social discussions.” For example, Lavrijssen was invited to explain in the House of Representatives what measures are needed to facilitate the integration of green electricity into the power grid. “And, as one of the members of the Energy Brigade of the Topsector Energy, I draw attention, at a national level, to the role of societal aspects of the energy transition.”

Complex puzzle

“The Community is not an official institution,” says Martijn Groenleer, professor of regional law and governance and driving force of the Community. “It is a voluntary—but not optional—way of working together across the Tilburg University Departments and Schools. The focus is on climate change and energy transition and how science can contribute to the debate on these issues.”

Groenleer: “The discussion is shifting from technological innovation to necessary social innovation. From heat pumps and wind turbines to, for example, rules for their usage, models for financing, or arrangements for participation. These questions are being asked more and more often. We do not have the answers, but we can study how these wicked problems work and make suggestions regarding how we can work on problem-solving approaches from there. We feed the debate.”

‘The climate debate is shifting from technological to social innovation’

‘It is a big, complex puzzle that we have to put together’
Impact in the oncologist's consulting room

‘What does this probability calculation mean for me?’

Patients who are diagnosed with cancer often have to make a choice of treatment together with their doctors at short notice. But how does a patient do this properly, taking into account all the factors of prognosis, risks, and side effects? And what do percentages mean for an individual patient? Together with the Integraal Kankercentrum Nederland (IKNL), Tilburg University is developing a tool to provide patients with personalized information.

More than survival chances

“In choosing a treatment, many factors are taken into account,” explains Xander Verbeek, Chief Innovation Officer at IKNL. “Treatment choices have always been based primarily on prognosis of survival. Nowadays, we look more and more at quality of life. Because an increasing number of people get and survive cancer but continue to have complaints afterwards. IKNL manages the Netherlands Cancer Registry, a treasure trove of data on cancer patients. Data we can use to sketch patient profiles. The result is a data-driven tool that focuses on the patient’s profile. What choices did people like you make in this position? It also looks at how patients want to receive the information in the tool. Different disciplines come together in the project: data science, language technology, and communication research.”

More information, more applications

After a year and a half, the contours are now in place. In a few years, there should be tools for colon and breast cancer. Krahmer: “I can imagine that you can develop something similar for all types of cancer based on the same methodology, adapted for that specific condition. We know from research that, sadly, little of the information from a conversation between doctor and patient is remembered. Then it is valuable for people to be able to consult tailor-made information at home.” The tool will be evaluated afterwards. “Important,” emphasizes Verbeek, “because we want to make a tool that really helps the patient. We are now starting to create concepts, and we also test these as we go along.”

‘IKNL manages a wealth of data on cancer patients’
How do you better organize health care chains?

‘Take the patient's needs as a starting point’

How do you organize the care pathway around a patient as optimally as possible? Tilburg University studied the care for children with Down syndrome in four Dutch hospitals. A study that we can apply to many more illnesses and care pathways.

Pediatrician at the Jeroen Bosch Hospital (JBZ) and endowed professor at Tranzo, Esther de Vries, has been working on the care of children with Down syndrome for years. Together with Bert Meijboom, full professor at Tilburg School of Economics and Management (TiSEM) and endowed professor of organization of health care chains at Tranzo, she started the research carried out by PhD candidate Vincent Peters at the JBZ, Elisabeth Tweesteden Hospital, Maxima Medical Center, and Spaarne Gasthuis.

Organization outlined
Researcher Vincent Peters is currently writing his dissertation. What did he find out? “A team takes care of children with Down syndrome under the supervision of a pediatrician. Each hospital shapes this in its own way within the framework of the existing multidisciplinary guideline. It turns out that professionals do not know exactly how other hospitals do this, and what tasks the colleagues in their own team have to perform. I have identified this, offering clarity and insight.”

Personalized care
“In addition, the difference in perspective on care was noticeable,” continues Peters. “Professionals look primarily from the point of view of the care they provide. While parents look at what their child needs. That’s a different starting point and results in a different conversation.” How do you better organize this kind of care? Bert Meijboom: “By organizing the care in a modular way, just as you do with Lego. Each block has its own characteristics; together they form a personalized care plan for a child.”

More applications
More healthcare professionals can benefit from these lessons. Esther de Vries: “In March 2019, a new PhD candidate started a similar study into colorectal oncology. The course of the care is different: the patient follows a more chronological care pathway than children with Down syndrome do. The research method is the same. The current research provides a good basis in terms of literature research and working methods.”

Collaboration based on expertise
The research is a collaboration between medical, economic, and social sciences. An added value, according to Peters. “I gain insight into and from different perspectives. That makes the research better.” “Tilburg University is the right partner for this kind of research,” says De Vries. “Universities with medical schools focus more on quantitative research. By incorporating the social sciences, you include how people want to do something.”
We Care provides a platform for collaboration

‘Interdisciplinary research to improve patient care’

Tilburg University and the Elisabeth-TweeSteden Hospital (ETZ) have been working together on various research projects for years. For example, within the research project Predict and Recover in the field of cognitive damage after a neurological condition. The ETZ and the university are now broadening their collaboration through the We Care program.

“The primary goal of We Care is to improve patient care,” explains professor Jantine Schuit, Dean of the Tilburg School of Social and Behavioral Sciences. “It is also a great opportunity for Tilburg University to demonstrate the added value of our research. The researchers of our Schools look at issues that play a role in healthcare from different perspectives: legal, social, psychological, communicative, and economic. That makes us a very suitable research partner for hospitals.”

Platform

Within the We Care partnership, €500,000 is available for research annually. The money for next year is now being distributed. The first assessment round has now been completed and a number of applications have been selected to write a more detailed application. “We Care provides a platform that increases the chance of collaboration between medical practitioners and researchers,” explains professor Bart Berden. As chair of the ETZ Executive Board, he is also enthusiastic about pooling expertise. “Tilburg University is a very suitable partner for this because the university has an eye for social issues within healthcare and health.”

Meaningful information

We Care has two themes: shared decision-making and data science. Berden: “This first theme is about quality of life. When choosing a treatment, you can look at the hard parameters, such as risk of complications and survival, but there are more aspects that are relevant. There is a person behind the care we provide.” Schuit: “The second theme of data science is, first and foremost, a current development in which healthcare and we as a university want to participate. Secondly, it is a different way of researching the development and effectiveness of treatments. That is very interesting. New treatments are now only being introduced after standard comparative research in which research is done first on animals and then on humans. It often takes years.” Berden also sees the importance of data science. “Data changes and enriches continuously, but it has to be converted into meaningful information. To do this, you have to collect and analyze data.”

On their own two feet

Berden hopes that it will be possible in the future to have a number of lines of research within We Care that can stand on their own two feet with the help of European or other grants. “We Care awakens a lot of enthusiasm. The ETZ is a place of care, research, and knowledge transfer. Hospitals thrive on collaboration in research.”
Four Departments work together from their own perspective

‘Business Tinder
COMPOSE matches companies’

How can companies collaborate in the field of logistics and at the same time strengthen each other in other areas? Four Tilburg University Departments are jointly researching this within the COMPOSE project. Professor Goos Kant: “Companies and people are being matched; it’s a kind of business Tinder.”

The employers’ association evofenedex and Tilburg University started the research two years ago thanks to an NWO grant. Kant: “How can we make collaboration easier? We came up with an online platform that has now been delivered as a minimum viable product. Within companies, senior management creates a profile on the platform. It becomes clear where a general match exists. Afterwards, the parties sit down to continue talks at a more detailed level.”

Collaboration on transport and more
“You have to build a lasting relationship because you know that you are going to run into issues that you have to solve together,” recognizes Nanne Schriek, project leader Supply Chain Management at evofenedex. “Previous research has shown that a personal link and a matching company culture are crucial factors for collaboration. Now, the scope of COMPOSE is focused on transport from or to the Netherlands. Kant: “But it’s more than just transport. For example think about a collaboration in the field of seasonal employees and the storage of seasonal products.”

Multidisciplinary
Four Departments within Tilburg University are involved, namely Social Psychology, TILEC, Supply Chain Management, and Econometrics and Operations Research. Why? Kant: “It’s a complex issue. How can companies work well together? Which (international) regulations are facilitating and which are not? How do the companies’ strategies match? And how do you calculate and settle the financial benefit? Everything counts. The great thing is that everyone looks at COMPOSE from their own point of view. Working together leads to insights that you wouldn’t have on your own.”

Advantages
“The first participating companies see the benefits,” says Schriek “It is better for a truck to be filled on its way back as well. At the same time, better use of truck capacity results in lower CO2 emissions, which is better for society. And there are also benefits for customers. Suppose a company delivers an order in Bulgaria once every two weeks, while a colleague does the same. By working together, they can supply their Bulgarian customers every week. In recent years, evofenedex has had a stronger focus on supply chain management and, therefore, on digitalization and collaboration, with which we want to help our members. COMPOSE fits right in with this.”
CentERdata investigates crime on business parks

‘Which toxic cocktail of factors encourages crime?’

Eighty percent of crime in the Netherlands is drug-related. Much of this crime takes place on business parks. How do you determine which business park is most at risk? And to what extent can data science help to develop effective policies? By order of the Ministry of Justice, CentERdata started working on these questions.

“The exploratory research is promising; now more large-scale research is required”

Patricia Prüfer

“Drug-related crime and subversion—in which the boundary between the legitimate and illegitimate business worlds becomes blurred—are major problems in the Netherlands. Run-down business parks often provide a fertile breeding ground for criminal activities,” says CentERdata’s lead researcher Patricia Prüfer. “Supporting data analyses and objective tools are required to predict why and where problems occur. The ultimate aim of the research was to provide administrators with concrete tools to help them determine what stage a business park is at.”

Predictive value

CentERdata carried out the research on behalf of the Dutch Research and Documentation Centre (WODC) of the Ministry of Justice and Security, together with Tilburg University and Avans University of Applied Sciences. CentERdata has extensive knowledge of policy research and data science techniques. Tilburg University’s Data Science Center has methodical knowledge of data science. In addition, Tilburg University has a number of researchers from different Schools who specialize in fraud, the fight against crime, and subversion. “There is a huge amount of data available from all kinds of businesses and agencies,” says Prüfer. “To what extent do these data have predictive value? That is what we wanted to know. To this end, we combined data from thirty business parks in Tilburg, including the Integraal Bedrijventerreinen Informatie Systeem (IBIS), the police, and the company register of the Chamber of Commerce.”

Combination of factors

Did the research produce surprising results? “It was especially interesting to see which combinations of factors are of influence. Think of obsolescence and vacancy, the value of the property, the level of supervision, the number of reports to the police, the turnover of businesses on a business park: these are all factors that play a role. But the type of business is also important, in terms of legal structure and size. And yet another indicator is the presence of many additional branches, such as additional Chamber of Commerce registrations and warehouses.”

More research

“The research yielded valuable insights into which factors contribute to crime and undermining,” concludes Prüfer. “But further research on a larger scale is required in order to be able to draw real conclusions. That is also what the Ministry is aiming for. It is also interesting to look beyond business parks alone. To what extent do the same risk factors apply, for example, to old farms? Questions we would like to explore further.”
Optimus calculates many scenarios

‘How an optimal supply chain feeds more mouths’

In 2018, 821 million people, worldwide, were suffering from hunger. Every 3.6 seconds, someone dies of starvation. How can optimization with data help to reduce the world hunger problem? Researcher Hein Fleuren: “The World Food Program (WFP) became really enthusiastic only after we developed a game about food distribution in South Sudan.”

Humanitarian organizations usually have little faith in optimization because of the difficult context, the need for quick results, and the lack of data. However, the following question arose: How can we reach as many people as possible with the highest possible nutritional value within a certain budget? Fleuren accepted the challenge to answer this question in 2010, later supported by talented Research Master’s student Koen Peters. Peters now works as a project manager at the World Food Programme in Rome and is an external PhD candidate at Tilburg University. He developed Optimus based on Fleuren’s work.

Flexible food basket

“We have mapped out the entire WFP supply chain in Optimus,” explains Fleuren. “The WFP has the largest humanitarian supply chain in the world. The major breakthrough in optimization was that we not only took the optimization of the supply chain itself as our starting point but also included the composition of the food baskets. How can you compose food baskets optimally and maintain the necessary nutritional value? A variable composition means that you can be more flexible in the selection of food commodities and, therefore, also in the purchasing, as long as the nutritional value is maintained. In Africa, for example, you can put other commodities in the food basket and buy these locally. This, in turn, benefits the local economy and reduces the distance for transport, thereby reducing CO2 emissions.”

Societal impact

The results from Optimus were used to significantly improve WFP’s operations in Syria, Iraq, Yemen, and Ethiopia and save millions. This allows more people to be fed on the same budget. The model is used for 4 to 5 major food operations per year. The aim is for the WFP to use Optimus to improve its cost-effectiveness for all 80 countries in which it is active. Optimus is being further developed in the Zero Hunger Lab of Tilburg University.

Scientific impact

In addition to its societal impact, Optimus has also produced a scientific publication. Fleuren: “Societal impact, therefore, goes hand in hand with scientific impact. Moreover, there are all kinds of smaller spin-offs. For example, we make material available for pupils’ school projects; prospective students are interested in our discipline. Moreover, we can show the value of science to a wide audience.”

‘The best part is that our work actually has an impact on people in need’

Hein Fleuren
Creating Value from Data

Institutes try to find answers to these societal issues always playing a key role. Together with our partners, the Impact Program. However, a lot more is happening behind the scenes with the designs of robots and AI. Core human values, which are then translated into discipline, control, and even repression. How do you design and program robots and AI to fit society in the area of privacy and human rights or by contributing to new technological forms of development can make society safer, easier, better, healthier, more efficient, and more productive. These developments can make society safer, easier, better, healthier, more efficient, and more productive. However, at the same time, they can threaten society in the area of privacy and human rights or by contributing to new technological forms of disciplining, control, and even repression. How do you design and program robots and AI to fit people’s standards and values? Trustee identifies core human values, which are then translated into the designs of robots and AI.

Optimal language development of young children

When children with well-developed language skills start primary school, it gives them a good chance to reach their full potential and, therefore, to live a healthy and happy life. A rich language environment contributes to this. But what do we mean by a rich language environment? And what is its effect on (brain) development? How do you improve the success skills of young children (0–4 years old)? And what behavioral interventions are available to support, motivate, and activate parents to realize this rich language development? The aim of the project is to increase the awareness of and knowledge about young children’s language development. In this way, all children who start primary school in the Netherlands can start at a good language level.

Putting an end to hunger

More than 10 million people died of hunger in 2018 and more than 800 million people worldwide are chronically malnourished. How can we help these people quickly, properly, and structurally? Of course, this is done by providing more efficient and effective food aid. But this can also be done by sharing knowledge and strengthening the capacity of farmers, businesses, and communities so that they can take care of their own sustainable food security. The Zero Hunger Lab at Tilburg University is studying how mathematics and smart algorithms can help with this. Researchers, for example, look at which crops should be cultivated and what the logistics infrastructure in a region should be. The mission is ‘data science for zero hunger’.
We contribute to the following Sustainable Development Goals.