Erasmus Centre for
Data Analytics

Centre for cross-disciplinary insight into AI, data and digitalisation

A year in review

2020

Erasmus University Rotterdam

Artificial Intelligence, Data and Digitalisation

In Research, Education and Valorisation

A year in review

2020

Contents

1/ Introduction

Erasmus University Rotterdam (EUR) faces the challenge of further shaping its research and teaching activities in the light of several national and international developments. Technological and social innovation is changing the world at a rapid pace. The most prominent change we see is the use of expertise related to data analytics (data science, data engineering, data visualisation) and the application of Artificial Intelligence (AI). This change requires a shift in our thinking.

For the EUR it is of great strategic importance to be well-connected to the development of data analytics and AI-related technology. Increasing internationalization of scientific research and education, mobility of students and staff, as well as the 'battle for brains', makes it is important to offer facilities that are at least up to international standards, and to create the proper conditions to retain the best students and academic staff.

To cope with this, the EUR needed a centre for the science of data analytics. A centre that co-ordinates and facilitates data science, data engineering and data visualization competence in research, education and valorisation, and offers a place where all stakeholders can work together applying AI-related technologies and methodologies.

Rotterdam School of Management, Erasmus University (RSM) recognized this need and decided in November 2018 to establish the Erasmus Centre for Data Analytics (ECDA). Thanks to the support of five founding partners, ECDA was launched at the inaugural Data Analytics Summit in July 2019.

Since that date, the ECDA team diligently worked on connecting all faculties and creating laboratories focused on the various aspects of data science and AI. To date, over 20 of these labs, or 'Expert Practices' have been established and ECDA has become a true interfaculty activity. In parallel, ECDA has been working to gain support to establish the Erasmus Data Collaboratory.

Having such a university-wide centre and facility that cuts across faculties, departmental or disciplinary silos, and is based on top research will undoubtedly increase the visibility of the EUR with public and private organisations. It may trigger participation in large international investment programmes – such as Digital Europe – that provide opportunities for business development, including executive programmes, contract research and the acquisition of external grants and sponsorships.

This document visualizes our ambitions and gives an impression of our activities in 2020. Please visit us at **www.eur.nl/ecda** to find out more. We hope that you will enjoy this summary, share our vision and support our ambitions.

On behalf of the ECDA team

Gerrit Schipper
Executive Director

2/ About the Erasmus Centre for Data Analytics

Our purpose is to facilitate Erasmus University Rotterdam and its public and private partner organisations in preparing society, in a hands-on and human-centred way, for a sustainable and data-driven future.

From the perspective of business and society, practitioners can benefit from the newest academic insights and analysis of their business problems that our research reveals, and from the questions raised by our trained researchers. Creating and cultivating collaborations with practitioners in organisations and businesses in every sector has been our primary aim since we formed this academic centre for cross-disciplinary insight in November 2018. From an academic viewpoint, we generate and collect high-quality data for research and academic papers. We seek projects that contribute to the quality of education and research in data analytics.

And as a part of one of the top academic institutions in Europe, we educate and share our knowledge via exchanges between corporations and students, and involve students in the industry's unfolding transformation and digitalisation. We also develop short education programmes about the added value of using data analytics for executives already working in business and society.

The Erasmus Centre for Data Analytics holds strategic importance for the Erasmus University Rotterdam in terms of enabling it to stay well-connected to the development of technology in general, and data analytics and artificial intelligence in particular. Increasing internationalisation of scientific research and education combined with associated mobility of students and staff – and competition in attracting and retaining them – makes it imperative that we create the proper conditions and offer the best available facilities. And while Erasmus University Rotterdam already had expertise in data analytics and artificial intelligence before ECDA was formed, this expertise was scattered; know-how was seldom shared between faculties, schools or research centres and AI-related initiatives were not generally distributed.

To address this, we have extended our interdisciplinary network within the university, and into the business community and into society. We have trained people from all kinds of organisations to find and use the correct data by giving them context and understanding. We have developed and presented executive education programmes that make use of a 'try-and-apply' attitude, created bespoke executive briefings for company boards, and we have spoken at international conferences and seminars. These efforts will continue throughout 2021 and into the future.

eur.nl/ecda

3/ Societal impact of AI

The Covid-19 pandemic has taught us that data, data sharing and the use of analytics are crucial in dealing with a global challenge such as the Covid-19 virus. And we know that the application of data analytics and AI create a lot of opportunities to contribute to solving societal challenges.

By combining several types of data and visualizing these in dashboards, insights can be derived in the spread of the virus and its implications. Furthermore, the use of predictive models on virus spreading have been used throughout the crisis to predict the next waves of infections and impacts of Covid-measures. We have also learned the importance of ethics, privacy, and accountability in the use of data and algorithms. Other societal challenges such as climate change, the energy transition and improving health of people will all benefit from the availability and sharing of more (quality) data and the use of analytics and AI to support decision making. And ECDA is determined to make a significant contribution. In 2020 ECDA's expert practices have developed activities with real societal impact. We pay particular attention to contributing to the United Nations' 17 Sustainable Development Goals (SDGs). Here we describe a few examples of societal impact activities from ECDA's researchers.

AI for health

In 2020, ECDA directors Antoinette de Bont, Moniek Buijzen and Gerrit Schipper initiated the Erasmus Initiative 'The Societal Impact of AI' for which they obtained grants. The Initiative paved the way for several projects to take place:

- Moniek Buijzen started her NWO-Vici project investigating effective and responsible health campaigns for adolescents using online social networks, while expert practice member Dr Esther Rozendaal acquired an NWO-Vidi grant for a five-year project about the media literacy of young people.
- ECDA academic directors Buijzen, De Bont and Prof. Ting Li were co-applicants in a large-scale proposal for a Gravitation project (funded by the Dutch government), with University of Amsterdam, TU Delft, and Tilburg University. Buijzen applied for a project in the funding programme for AI and healthy lifestyle and living environment, together with TUDelft, Amsterdam University Medical Center, the City of Rotterdam and other societal partners. More information via **https://www.planetrock.ai/**
- Prof. Claartje ter Hoeven from the Erasmus School of Social and Behavioural Sciences acquired a prestigious Consolidator grant from the European Research Council for her project on the well-being of ghostworkers, and human digital labour in data analytics.

Pandemic crisis prediction and AI decision support

Scientists from the Pathology and Clinical Bioinformatics department at Erasmus Medical Center, including ECDA director Prof. Peter van der Spek, and Dr Rogier Louwen from the department of Medical Microbiology, have successfully secured funding for a STAMINA project (Smart support platform for pandemic prediction and management) worth € 11 million, of which € 9.5 million is funded by the European Union. The STAMINA team will try to improve a joint response by developing a warning system, rapid diagnostics, monitoring software and supporting decision-making models for governments, using smart self-learning technologies that will be established during the project.

Supporting roll-out of Corona vaccinations

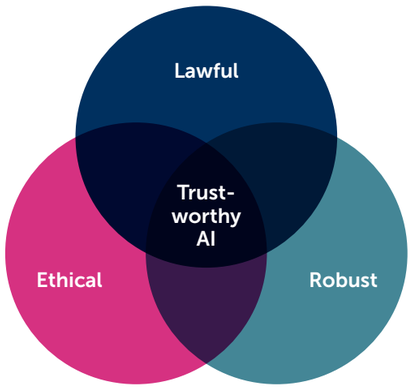
Prof. Jan Fransoo, professor of operations and logistics management at Tilburg University and Eindhoven University of Technology, and **Dr Niels Agatz**, associate professor of transport and logistics at RSM and researcher of XP retail analytics within ECDA have gathered fundamental and proven insights from the science of operations and logistics that can contribute to a rapid and effective roll-out of vaccinations and minimise wasted doses.

1. Working with larger locations to store the vaccines leads to less vaccine waste
2. Linking every decentralised vaccination site to one of the major vaccination centres reduces the risk of vaccine loss
3. Creating bigger vaccination centres makes the system flexible and robust.

Trustworthy and accountable AI

In April 2019, the European Commission presented a set of Ethics Guidelines for Trustworthy Artificial Intelligence, according to which AI should be:

- **lawful**, respecting all applicable laws and regulations
- **ethical**, respecting ethical principles and values
- **robust** from a technical perspective while considering its social environment.



What is still missing, however is an implementation framework for responsible and auditable AI that follows these guidelines, and that offers guidance for organisations interested in developing AI – here are a couple of examples where ECDA has been able to provide that guidance.

ECDA's academic director Dr Iuliana Sandu, and RSM Assistant Professor of Business Analytics Dr Otto Koppius have developed a framework for responsible and auditable AI and ethical algorithms, which has been was validated by the Rotterdam Court of Audit from December 2020 to March 2021. Research was conducted by master student Ron Koppers under the supervision of Dr Sandu and Dr Koppius.

ECDA's MAPS XP, led by Dr Jason Pridmore, will join the EU-funded SPATIAL project (Security and Privacy Accountable Technology Innovations, Algorithms, and machine Learning), which is expected to start in September 2021. It addresses the challenges of black-box AI and data management in cybersecurity. The project will design and develop resilient accountable metrics, privacy-preserving methods, verification tools and system frameworks that will serve as critical building blocks to achieve trustworthy AI in security solutions. In addition to technical measures, the SPATIAL project aims to facilitate generating appropriate AI security skills and education to address technological complexity, societal complexity, and value conflicts in AI deployment. In addition, the work carried out in SPATIAL will serve as a stepping stone to establish an appropriate governance and regulatory framework for AI-driven security in Europe.

The ECDA team will comprise ESSH researchers Jason Pridmore, João Gonçalves, Anouk Mols and Daniel Trottier. Their work will focus on embedded social science research analysis including the social and communicative practices of technical development in this field to ensure better development and deployment of accountability within AI systems. The project is led by partners in TU Delft, making this project a key connection in Erasmus University Rotterdam's Convergence initiative. The project represents a collaboration between universities and companies throughout Europe such as University College Dublin, Fraunhofer-Gesellschaft and NEC from Germany, Telefonica in Spain, and F-Secure from Finland.

Privacy, security and ethics for Digital Twins

ECDA's MAPS XP, led by Dr Jason Pridmore, is also part of the EU funded project ASHVIN *(Assistants for Healthy, Safe, and Productive Virtual Construction Design, Operation & Maintenance using a Digital Twin)*, which started in October 2020. It aims to significantly improve the productivity of the European construction industry, while reducing costs and ensuring safer working conditions. MAPS XP is developing a European-wide digital twin standard – an open-source digital twin platform that integrates the Internet of Things (IoT) and image technologies, and a set of tools and demonstrated procedures. The ASHVIN solutions will carefully account for worker protection and privacy issues that come with the tracking of construction activities. In practice, some of the activities of the project will provide a way to fuse video data and sensor data, integrate geo-monitoring data, and provide Multiphysics simulation methods for digitally representing the behaviour of a product, not just its shape. This also includes developing 4D simulation and visualization methods for construction processes, alongside a lean planning process supported by real-time data.

The ECDA team for the ASHVIN project will comprise researchers Dr Jason Pridmore, João Gonçalves and Jorge Campos from the the Erasmus School of History, Culture and Communication (ESHCC). Their work focuses on the privacy, security, ethics and societal implications of digital twin technology implementation, zooming in on issues such as workplace surveillance and data privacy. The project is led by TU Berlin and involves partners from nine EU countries, combining a wide range of backgrounds such as SMEs, non-profits and research organizations.

Global tech, inclusion and diversity

Prof. Payal Arora has received a grant from the International Development Research Council (IDRC) to work on the challenge of Organizing Digitally: Opportunities for Collectivization among Female Workers in South Asia. The project, which will run from 2020-2023, is co-led by Prof. Usha Raman from the University of Hyderabad.

4/ Expert practices

As an education provider and a research institution, we have a wide range of multi-disciplinary expertises. Our expertise comes from world-class academics at EUR. We can make that expertise available across a wide range of domains in business, public organisations, and in society at large. To facilitate that we have established a great number of Expert Practices (XPs), led by academic directors from EUR faculties. These XPs are grouped in four categories:

- Organization and governance;
- Technologies and methodologies,
- Societal impact and human perspective;
- Specific application domains.

This way we can bring a holistic and multi-disciplinary perspective to solving societal challenges, and stimulate innovation crossovers among different expert practices.

Organization and governance

- Digital business
- Datapreneurship
- Trustworthy and accountable AI
- Law and digital compliance
- Media, AI, privacy and surveillance (MAPS)

Societal impact and human perspective

- Psychology of AI
- AI, digital communication and behavioural change
- User experience (UX) research and global tech design
- Customer analytics

Technology and methodologies

- Data science methodology
- Trial design and experimentation
- Personalization
- Virtual and augmented reality
- Cybersecurity

Data analytics and AI for specific application domains

- Health and management AI
- Bioinformatics
- Smart energy and sustainability
- Sustainable global supply chains and ports
- Inclusive smart cities and communities
- FinTech
- Retail analytics

Expert practices in the spotlight in 2020: A selection

AIS Impact Award
Expert Practice '*Digital Business*'

Eric van Heck, (Rotterdam School of Management - RSM), Professor of Information Management and Markets and researcher in ECDA's 'Digital Business' XP has received the award for his contributions to the project AI in the Floriculture Chain exploring the potential value of AI and developing applications for growers, auctioneers, transporters, and supply chain managers of flower products.

AIS Technology Challenge Award
Expert Practice *'Digital Business'*

Prof. van Heck also was awarded for a significant contribution to the development of AIS resources, in particular his efforts to convert the annual European Conference on Information Systems (ECIS) 2020 to an online format, and the formation of the AIS Virtual Conference Series (VCS) in response to the Covid-19 Pandemic.

Developing clinical trials

ECDA's multidisciplinary nature sometimes works in interesting ways to generate synergies as relationships deepen. A good example is the application of morphing algorithms, developed for personalising websites in the marketing analytics lab. Prof. Gui Liberali, from the marketing department at RSM, conducted a research project with researchers from the departments of Cardiology, Public Health, and Neurology at Erasmus Medical Center, in Rotterdam and from MIT's Sloan School of Management. They are introducing a new clinical trial method based on morphing and evaluating its performance in large-scale clinical trials. This project has the potential to increase the effectiveness of clinical trials, something that has become even more prominent and relevant during the pandemic in 2020.

Best Societal Impact 2020 excellence award
Expert Practice *'Health & Management AI'*

Marjolijn Heerings, (Erasmus School of Health Policy & Management - ESHPM), academic researcher in ECDA's 'Health & Management AI' XP was honoured with this award for the design of a collaborative participatory instrument called *Als je het ons vraagt* (If you ask us). It engages residents in long-term care facilities in improving the quality of their own care. The jury said the relevance and usability of the instrument arewere underlined by its adoption by two knowledge platforms for professionals in the sector, and it was selected for follow-up research by the Dutch organization for healthcare research and healthcare innovation ZonMw, and by the Dutch Research Council NWO.

Best Article 2020 award
Expert Practice *'Health & Management AI'*
Dr. Marthe Stevens, (Erasmus School of Health Policy & Management - ESHPM), external researcher in ECDA's 'Health & Management AI' XP received this award for her article called *Epistemic Virtues and Data-driven Dreams: On sameness and difference in epistemic cultures of data science and psychiatry* published in *Social Science and Medicine*. The jury described the paper as an 'excellent example of interdisciplinary research, especially using insights from data science and psychiatry, and articulating them through the innovative concept of epistemic virtues'.

Nomination for Huibregtsen prize
Expert Practice *'AI, Digital Communication and Behavioural Change'*

Moniek Buijzen, (Erasmus School of Social and Behavioural Sciences – ESSB), Professor of Communication and Behavioural Change and Academic Director of ECDAS's 'AI, Digital Communication and Behavioural Change' XP led The MyMovez project that investigates how health campaigns can best be implemented for young people that was selected runner-up for the prestigious Huibregtsen prize for research that combines scientific excellence and innovation with exceptional societal value and outreach. The project uses data analytics and AI in social media to combat excess weight in young people.

Teaching Case Award
Expert Practice *'Psychology of AI'*
Stefano Puntoni, (Rotterdam School of Management - RSM), Professor of Marketing and Academic Director of ECDAS's 'Psychology of AI' XP won a number of awards for a teaching case about TomTom, describing how the navigation technology company is building its future on high-definition maps for autonomous driving. Prizes include The Case Centre's Outstanding Case Writer Award 2020, EFMD Case Writing Award 2020, and Case Centre's Marketing Case Award 2021.

Dissertation Award
Expert Practice *'Psychology of AI'*
Gizem Yalcin, (Rotterdam School of Management – RSM), PhD candidate received an honourable mention at the Dissertation Awards of the Psychology of Technology Institute for her dissertation proposal, titled *Men versus Algorithm: Unraveling the Dynamics Between Humans and Algorithms in Consumer Behavior*.

Nomination as 'Women in AI Hero' by AI4EU
Expert Practice *'UX Research and Global Tech Design'*

Payal Arora, (Erasmus School of Philosophy – ESP), Professor in Technology, Values, and Global Media Cultures and Academic Director of ECDAS's 'UX Research and Global Tech Design' XP, has been nominated by the AI4EU Gender Committee for her work in the field of AI and technology. Forbes called her the 'next billion champion' and the right kind of person to change technology.

Successful Launch Algorithms Repository
Expert Practice *'Customer Analytics'*
Aurélie Lemmens, (Rotterdam School of Management – RSM), Associate Professor Marketing and Academic Director of ECDAS's 'Customer Analytics', led the group developing the ProfitBoost R package that helps companies to find ways to retain their customers by predicting which customers businesses should target. This package was the first package available in the ECDA Algorithms Repository. Several of our partners are currently successfully experimenting with the package.

5/ Selection of activities in 2020

JANUARY

Education: Leadership Challenges with Data Analytics
Several of our academic directors and expert practitioners taught a leadership programme to multi-disciplinary teams from organisations including Municipality Rotterdam, Siemens, Quint Wellington Redwood, ING and Erasmus University Rotterdam.

Workshop: OASC Smart City Forum
ECDA Associate Executive Director Dr Marcel van Oosterhout presented findings from the RUGGEDIZED smart city project on urban data platforms (funded under the European Union's Horizon 2020 research and innovation programme) during the OASC Open and Agile Smart Cities forum in Brussels, Belgium.

Launch Jean Monnet Centre of Excellence on Digital Governance (DIGOV)
The newly established **Jean Monnet Centre of Excellence on Digital Governance (DIGOV)** founded by Prof. Klaus Heine from the Erasmus School of Law, hosted a conference focused on a topic on the perimeter of digital governance – an inventory of the hotspots of digital governance and a discussion of best practices and approaches for addressing challenges of the ongoing digital transformation. Questions discussed the outer limits of digital governance and the internal modalities of achieving it – directly or indirectly, and privately or publicly.

Data Analytics Skills Put to Practice
Students in the Data Science and Marketing Analytics program at Erasmus School of Economics spent eight weeks to provide theoretically grounded, data-driven solutions to five real-life business cases. In these cases, students 1) built personalized recommendation systems for SphereMall; 2) made individual-level purchase and e-mail engagement predictions for Feyenoord Rotterdam N.V. fans; 3) assessed the short-term impact of TV commercials on Coolblue's website visits and tried to determine the causes of such increase; 4) developed data-driven recommendations to improve the efficiency of KPN direct marketing campaigns across channels, from e-mail marketing to telemarketing; and 5) used text mining tools to help UNICEF Nederland improve their social media communications.

Students impressed company management when they presented their results at the company's headquarters. The scale and open-ended nature of the business case was an exciting challenge. Going through this whole process from project brief to end result was very much appreciated by the students.

An AI testing facility for smart cities – workshop
There were recommendations for the European Commission for AI in the context of smart cities in a presentation by ECDA Associate Executive Director Dr Marcel van Oosterhout. His recommendations for developing AI and digital innovation hubs included:

1. An infrastructure for sharing of big data sets from different backgrounds
2. Supporting hands-on learning and using an agile approach
3. Basing each hub on a triple helix approach, or a quadruple helix by including citizens
4. Facilitating open innovation with open standards and involving a variety of stakeholders including researchers, students, SMEs, NGOs and start-ups
5. Offering a neutral and risk-free environment for testing , tool validation and use case development
6. Developing a shared perspective on data, AI ethics, and accountability
7. It should enhance the digital literacy of the stakeholders involved.

NWO Blockchain grant
ECDA Academic Director Dr Dion Bongaerts received a grant to research Blockchain from the Dutch National Science Foundation (NWO). The research is for a consortium project that aims to start an online community of 50,000 internet users

to evaluate the principles of an 'internet of trust'. His interdisciplinary project uses computer science, economy, and legal knowledge. The total amount of the grant is €3.3 million.

FEBRUARY

Erasmus Recruitment Days
ECDA took part in the annual Erasmus Recruitment Days event for students at Erasmus University, to introduce them to Centre and its ecosystem of public and private partners.

Blockchain workshops
ECDA was represented at two workshops on Blockchain technology in February. Dr Dion Bongaerts from ECDA's XP Fintech attended the 2Tokens roundtable, and [who from ECDA was there?] attended the EPE Think Tank on the use of blockchain for the European New Green Deal.

MARCH

Workshop: Innovation Quarter Study on South Holland AI Ecosystem
A meeting of experts in the Zuid Holland regional AI ecosystem partners included input from ECDA, which also contributed to a **study** conducted by Innovation Quarter along with more than 40 other organisations, including those involved in start-ups and capital, research and innovation, industry adaptation, and human capital. The report specifically focused on developments in Greater Rotterdam and The Hague, where AI applications are concentrated within six specific domains: life sciences and health, manufacturing, port and maritime, horticulture, security, and energy and sustainability. The Zuid Holland region is well-positioned to generate great impact in these domains. With three global top-100 universities providing top tier talent, several technological top institutes, world-leading corporations and a thriving start-up ecosystem, the region is equipped for the global AI race. ECDA is one of the important initiatives in the Zuid Holland AI ecosystem

Keynote on retail analytics at European Workgroup for Retail Operations
ECDA Lab Director of the Retail Analytics expertise area Dr Robert Rooderkerk delivered the keynote at the EURO Working Group on Retail Operations. His presentation on 'Retail Analytics: From Big Data on Consumer Behavior and Operational Performance to Actionable Insights' included discussion of the introduction of new technologies in the retail value chain that leads to an abundance of new data sources for better measurement of consumer behavior and operational performance. His study will provide practitioners and academics with a clear roadmap for best practices and future research into retail operations. He identified nine decision areas for retail analytics, including inventory management, product promotions, distribution and delivery, and demand management.

Source: Innovation Quarter

APRIL

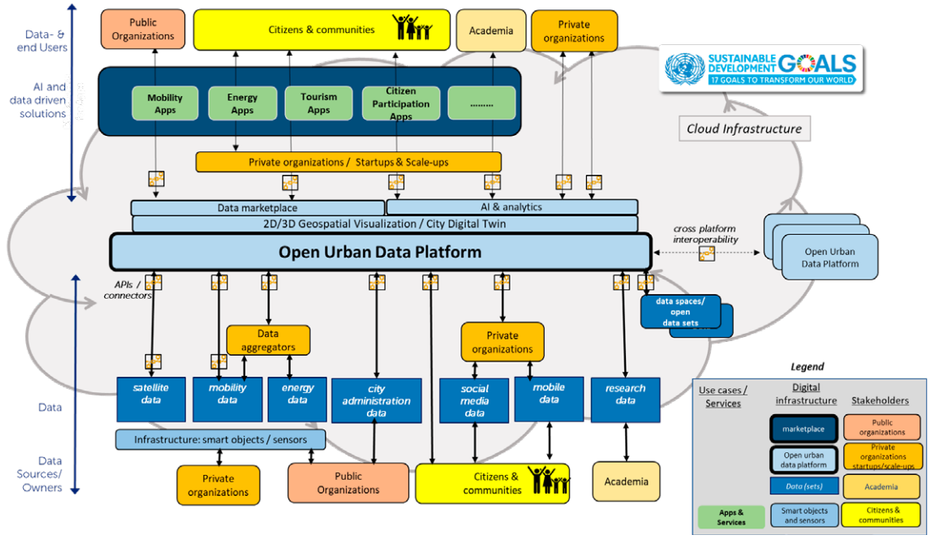
Expert meeting on cities data ecosystems with EC representatives
ECDA's Dr Haydee Sheombar and Dr Marcel van Oosterhout led a meeting with representatives from the European Commission to discuss findings of a European study among 80 cities, with insights and recommendations for a city's data ecosystem and urban data platform development.

Project development: EU digital platforms for rural areas
ECDA is involved in a collaborative proposal for an EU call with the Province of Zuid Holland, the cities of Rotterdam and The Hague and several other partners. The proposal is led by the Austrian Institute for Technology (AIT), Austria's largest research and technology organisation, and includes data governance, use cases on biodiversity, energy transition, citizen engagement and participation and sustainable mobility.

Education: new minor on smart and shared cities
A new minor "Smart and Shared Cities" will introduce bachelor-3 students from the Leiden, TU Delft and Erasmus universities to smart city concepts and the complexity of modern cities. It will be led by ECDA's academic director for AI and Social Inclusion Prof. Liesbet van Zoonen of the Erasmus School of Social and Behavioural Sciences. The minor is a combination of data, urban, political, and social sciences. focused on urban technologies and data science with citizen experience and multi-stakeholder governance. Its approach will help students to understand the complexity of smart city life.

MAY

Expert advice to Dutch House of Representatives
ECDA's academic director for AI and Social Inclusion Prof. Liesbet van Zoonen produced an academic factsheet for the temporary committee on the digital future of the Dutch House of Representatives



Source: ECDA, EU Ruggedised

(*Tweede Kamer*). It describes the influence of digitization on public values and vice versa. Drawing on existing criteria for both ethics and data quality, the academic factsheet outlines a path for further developing the democratic process of citizen participation in the digital society.

Customer retention with data analytics project for Honours students

Students on the Honours track of RSM's MSc in Business Information Management were invited to solve a data analytics case with Allsafe in May and June. This challenging extracurricular course, part-time over seven weeks, saw them working on the personal storage rental company's

Webinar UNESCO Connectivity for Learning in the COVID crisis

ECDA academic director Payal Arora, Professor of Technology, Values, and Global Media Cultures, contributed to a UNESCO webinar with Prof. Tim Unwin UNESCO Chair in ICT4D; Alexandre Barbosa , Head of the Center of Studies for Information and Communications Technologies (CETIC); Hani Eskandar senior co-ordinator for the International Telecommunication Union (ITU); Alexa Joyce, Director for EMEA Digital Transformation & Skills at Microsoft; and Zohra Yermeche, program director for Sustainability and Corporate Responsibility at Ericsson.

Conference: future mobility and smart sector coupling

ECDA's XP representatives organised the second edition of the Living Energy Conference on smart energy and sustainability, in collaboration with the German Institute of Energy Economics at the University of Cologne. The virtual event had the theme Future Mobility and Smart Sector Coupling. Among the keynote speakers was Andreas Pinkwart, German State Minister for Economic Affairs, Digitization, Innovation, and Energy.

EC webinar: How to scale up digital solutions in smart cities and communities

A presentation on urban data platforms was given by ECDA's Dr Haydee Sheombar, based on findings from the RUGGEDIZED project. She gave five key takeaways:

1. Urban data platforms are in their infancy but rapidly gaining traction
2. Such platform mechanisms are a way to scale smart city initiatives
3. Governance, capabilities, and collaboration build the trust needed for them to work
4. Capability building is also needed; not all required capabilities exist for public or private sector actors
5. Regional technical solutions and capability building will be needed for smaller cities.

JUNE

Whitepaper on Artificial Intelligence – a European Approach

Prof. Klaus Heine of the Erasmus School of Law and the Erasmus School of Economics, and Prof. Evert Stamhuis of the Erasmus School of Law wrote a reply to the 'Consultation Commission White Paper on Artificial Intelligence – A European Approach' which addresses important issues for digital technology using AI. Their reply commented on three issues in which they partly endorse the EC's approach and gave guidance for following up. They support the sectoral approach and commented on the proposal for a governance and enforcement structure; they proposed dealing with liability issues by pointing out challenges; and they proposed testing the human centeredness of AI systems as a building block for the ecosystem of trust to demonstrate how a contextual approach leads to the best possible results.

Energy webinar series

There has been positive feedback for the new series of webinars launched by ECDA's Dr Yashar Ghiassi-Farrokhfal and cluster company CleanTechDelta, to foster collaboration and synergy of information between industry and academia. The ECDA-CTD energy webinar series invites speakers from industry and from academia to speak to an audience of practitioners and academic researchers on energy-related themes such as electric mobility, smart heating systems, and energy co-operatives. Holding the events online means the webinars attract international speakers and participants. The organisers plan to embrace the opportunity presented by their forced online environment to increase the exposure and impact of the series.

Dutch AI Coalition membership

ECDA became a member of the Netherlands AI Coalition, set up to substantiate and stimulate AI activities in the Netherlands. It's a public-private partnership in which the government, the business sector, educational and research institutions, as well as civil society organisations, collaborate to accelerate and connect AI developments and initiatives. The ambition is to position the Netherlands at the forefront of knowledge and application of AI for prosperity and well-being while observing Dutch and European standards and values. The NL AIC functions as the catalyst for AI applications in the Netherlands.

Workshop: Digital City Rotterdam

ECDA Associate Executive Director Dr Marcel van Oosterhout presented the findings of the EU RUGGEDIZED project on urban data platforms during a workshop for stakeholders from the Rotterdam smart city ecosystem.

JULY

ECDA as a learning community

ECDA and its ecosystem was presented as one of the best practices on how to design a learning community that links students, faculty, public and private stakeholders in a workshop on learning communities. The presentation was made by ECDA Associate Executive Director Dr Marcel van Oosterhout to the Netherlands AI Coalition (NLAIC) during one of their 'Tech in a Day' sessions.

Erasmus Data Summit

The second Erasmus Data Analytics Summit on the theme of 'Impact of AI on Society' featured keynote speakers Franz Muller, President and CEO of Ahold Delhaize, and Hans-Aloys Wischmann, Program Manager AI at Philips. Eight parallel tracks, hosted by ECDA academic directors, were on a wide range of expert practice topics. The Erasmus Data Summit was attended by more than 500 people; business managers, entrepreneurs; policy makers, MBA, and master students; people working at the intersection of data science and social impact, in international smart communities, health, FinTech, digital business and marketing, and supply chain analytics.

New tech partner: Blockbax

ECDA established a new corporate partnership agreement with Blockbax, which offers an IoT platform software platform. The platform, called SaaS, can be easily connected up to sensors and measurement systems, plus self-service dashboards for the data can be set up and more importantly, it allows domain experts like maintenance engineers to configure the business rules to be applied to incoming data in real time.

AUGUST

Ahold Delhaize wins trophy for excellent cybersecurity transparency

Frans Muller, CEO of Ahold Delhaize, and Florence Mottay, Global Information Security Officer of Ahold Delhaize, received the first Cyber Security Annual Report (CSAR) Index trophy from Index founders Bernold Nieuwesteeg and Eva Eijkelenboom. The CSAR Index is a collaboration between the Centre for the Law and Economics of Cyber Security (CLECS) and the International Center for Financial Law and Governance (ICFG), two research institutes connected to Erasmus School of Law. Ahold Delhaize is now the most appreciated listed company of 2020 for the transparency of its cybersecurity and for the way it deals with cybersecurity challenges.

The CSAR Index aims to provide an overview of the degree of this transparency that listed companies display in their annual reports.

SEPTEMBER

Expert advice to Covid-19 exit strategy

Moniek Buijzen, Professor of Communication and Behavioural Change in the Erasmus School of Social and Behavioural Sciences is one of the experts in the ZonMW project 'Conditions for technological solutions in a Covid-19 exit strategy, with particular focus on the legal and societal conditions'. ZonMW finances health research and stimulates the knowledge to improve care and health. The project is led by Principal Investigator Natali Helberger, Professor of Law and Digital Technology at the University of Amsterdam.

Education: New MScBA in Business Analytics & Management

RSM's new MScBA in Business Analytics & Management was launched with ECDA Academic Director Dr Robert Rooderkerk in the lead and 91 students in the inaugural cohort. The one-year programme is aimed at bachelor graduates with a business background and a good quantitative or technical orientation, as well as graduates from engineering and the hard sciences who are interested in business. It's a specialised master programme for those who want to develop their skills in managing complex business analytics projects – from understanding the business problem and its environment, and selecting and executing the methods of analysis, to communicating the results to internal and external stakeholders.
www.rsm.nl/BAM

Launch of Recharge Earth platform

ECDA is one of the early contributors to Recharge Earth, a new collaboration platform for professionals in the energy transition who want to start valuable collaborations, broaden and strengthen their networks, gain and share knowledge and inspiration. Recharge Earth connects people and organisations in the energy transition: governments, companies, knowledge centres, financiers, start-ups, and scale-ups. A kick-off meeting was organised in Rotterdam with partners including City of Rotterdam, Eneco, and CroonWolter&Dros. ECDA represents Erasmus University Rotterdam in the platform and contributes from its expert practices such as smart energy and sustainability.
www.recharge-earth.com

Executive Education: Leadership Challenges with Data Analytics

Another edition of the holistic training programme on data and analytics capabilities, this time redesigned into an interactive online format by ECDA, saw around 25 professionals from seven organisations take part. They acquired new knowledge and diverse skills for data analytics, leading to fresh insights that can drive new value creation opportunities in their organisations.. Participants included teams from the Municipality of Rotterdam, Quint Wellington Redwood/Anchormen, Croonwolter&Dros/Mobilis, ING and Erasmus University Rotterdam. Participants worked on business cases about their own use of data in a learning-by-doing exercise, alongside coaching from ECDA academics and expert practitioners. They learned to apply data analytics technologies and AI, improved their business and communication skills, and boosted their understanding of privacy, security, ethics, and accountability.

Student bootcamp on process mining

ECDA supported the student-led Erasmus Tech Community in organising an extra-curricular bootcamp with execution management system company Celonis on process mining – the analytical discipline for discovering, monitoring, and improving processes as they actually are rather than as IT engineers think they might be. The bootcamp lasted for four weeks and trained over 30 students.

Rotterdam's Culture Campus and AI

Prof. Moniek Buijzen chaired a working group developing the research agenda for the Culture Campus initiative in the Rotterdam Zuid district of the city, due to start in 2022. The working group comprises representatives from Erasmus University, Codarts, and Willem de Kooning Academy. Their agenda is developed in cocreation with societal partners in Rotterdam Zuid. AI is one of the three programme lines, investigating how the use of AI in art can create new opportunities for art, science, and urban culture to unlock their full potential.
www.cultuurcampusrotterdam.nl/en/

Port of Rotterdam as a living laboratory

Prof. Rob Zuidwijk gave a keynote presentation during the International Conference on Computational Logistics focusing on the Port of Rotterdam as a living laboratory, where practitioners perform pilot studies and academics develop new methods to put innovative logistics concepts to the test. One of these concepts is synchromodal transport which offers mobility of freight instead of specific transport capacity. Such advanced planning concepts are data intensive so require a proper understanding of the data needed to enhance the quality of planning. In some cases, just a marginal improvement of data quality may help create better prognostics and planning – and academics have been able to hand their methods and insights back to practitioners as a result of discovering this, providing a connection between innovative practices in container transport and academic discourse.

OCTOBER

Netspar Grant on Individual Pension Choices in Uncertain Times

A Netspar grant worth 250.000 euro from the Network for Studies on Pensions. Ageing and Retirement was obtained by ECDA's Prof. Bas Donkers and Prof. Benedict Dellaert for their research *Individual Pension Choices in Uncertain Times: Advancing Digital Support for Risky Pension Decisions*

Research collaboration with ExamenOverzicht

ECDA has established an agreement for sharing data with ExamenOverzicht, an organisation that supplements high school students' learning and revision for their exams. The intention is to explore students' preparations for the Dutch state-administered exams at the end of high school education. The project is leaded by ECDA academic director for digital business Prof. Ting Li.

Legal Personality in the AI4EU café

Prof. Klaus Heine gave a lecture about AI and Legal Personality in the AI4EU café webinar in October. It mapped pending questions on the legal status of AIs such as the appropriateness of granting AIs the status of a distinct legal person to which responsibility and legal obligations can be attributed, and what advantage there may be for doing so.

Human centric AI and kick-off ELSA Labs Dutch AI Coalition

Prof. Liesbet van Zoonen was invited to present the Leiden-Delft-Erasmus approach to smart city research, typified by design thinking and co-creation as exemplary for the kick-off meeting of the ELSA Labs of the Dutch AI coalition.

How real-time data reshapes our cities

ECDA Associate Executive Director Dr Marcel van Oosterhout presented findings of the RUGGEDIZED project on urban data platforms and participated in the panel discussion at the ScienceBusiness Network event 'How will real-time data shape our cities?

Data Visualisation bootcamp for students

ECDA's technology partner and business intelligence software company Tableau , the Erasmus Tech Community, and ECDA hosted a four-week bootcamp on data visualisation; 40 students gained hands-on training and tried out a final case to test their acquired skills.

Project development "Planet Rock"

ECDA is part of an investigation into the potential of AI for a healthy lifestyle and living environment in deprived urban neighbourhoods in the PlanetRock project. It's a collaboration of ECDA (represented by academic director Prof. Moniek Buijzen) with Amsterdam University Medical Center, Technical University Delft, and VU Amsterdam.
www.planetrock.ai/

NOVEMBER

Utrecht's smart city as a business model

Opportunities for designing new business models in the context of the Utrecht urban data platform – specifically smart mobility services – was the subject of a workshop presentation for the IRIS Smart Cities project by ECDA Associate Executive Director Dr Marcel van Oosterhout.

Project development: EU Green Deal – green ports

ECDA is involved in the development of a collaborative proposal for the EU Green Deal in collaboration with Port of Rotterdam, TU Delft, TNO, EWI Cologne and a consortium with over 30 partners. The MAGPIE project , an acronym for *sMArt Green Ports as Integrated Efficient multimodal hubs*, aims to find

the optimal mix of different modes of transportation and energy carriers using AI. Other topics include the development of a port digital twin, pilots with autonomous transport and solutions for non-technical innovation challenges.

DECEMBER

New website ECDA
Our new website went live in December. After our first couple of years we can now properly describe our activities, partnerships, and details of the impact we have been able to make. You can explore all of that at **www.eur.nl/data**

Webinars: Erasmus alumni lecture on data-driven city
ECDA Associate Executive Director Dr Marcel van Oosterhout gave a lecture about a data driven city and how technology can improve cities to alumni of Erasmus University – one of a series of monthly events in the Alumni Lecture series.

SmartPort report on the impact of data, AI and platforms for the freight forwarding industry
Prof. Rob Zuidwijk has addressed the impact of booking platforms on the freight forwarding industry, in a **study** made in collaboration with TNO, the Netherlands Organisation for applied scientific research. The study makes three main conclusions:

1. Customer intimacy offered by traditional freight forwarders may support a comprehensive service package and create peace of mind for customers but digital freight forwarders seek to provide a comparable customer experience by using advanced information services;
2. Hinterland complexity may be reduced by transparency in service offerings via digital platforms
3. Customs complexity may be addressed by the use of machine learning.

6/ The Erasmus Data Collaboratory

The Erasmus Data Collaboratory is meant to become an inclusive open learning environment for data and AI on campus at Erasmus University Rotterdam, where people can think, work, learn together, and invent. This physical hub has space and facilities for hands-on action learning, action research, experimentation, and valorization, and it facilitates the complete data science cycle, from data engineering to data analysis and including data visualization.

ECDA partnered with leading tech companies and start-ups that offer cloud infrastructure for data and AI, access to specific data sets and algorithms, and use of advanced tools for AI and machine learning, process mining and visualization. Here's where students from the Erasmus Tech Community and Turing Students Rotterdam can plan and execute their activities, and where ECDA's corporate partners meet to learn, share, and research collaboratively.

Creating positive societal impact

A primary aim is to foster collective creativity to create societal impact. It brings together students, academics, public and private partners, and start-ups and scale-ups. They work on the energy transition, resilient deltas, health systems, and on creating smart and inclusive cities. These issues are usually complex and hard to resolve, demanding approaches that are creative, systemic, and divergent. Every design challenge will involve highly experienced and expert facilitators.

A lab environment for hands-on training and in-depth research

Operating as a lab environment for the expert practices of ECDA, it will also be the place for hands-on training, where students from different education programmes and backgrounds can work with real datasets and data analytics, AI and ML tools.

Responsible Data Management

Responsible data management (RDM) is an integral element, with advice and support from the university's data stewards for researchers throughout the research data life cycle, in accordance with international RDM standards and FAIR principles. Researchers are helped with General Data Protection Regulations (GDPR) by the EUR privacy officer so that research infrastructure data, software codes, research material and corresponding metadata can be shared safely and stored securely – these measures facilitate collaboration in international consortia. ECDA ensures that collaboration and data-sharing with its partners are compliant with legal provisions and codes.

Hub on campus at Erasmus University Rotterdam

A physical space for the Erasmus Data Collaboratory and the technology stack is under development, and is expected to open in fall 2021. It will include:

- a data lab, equipped with high-quality workstations with high-resolution displays, connected to a cloud infrastructure through fast connections.
- a visualization space, with advanced digital projection facilities
- a multimedia-equipped boardroom
- well-equipped project and meeting rooms, that will be equipped with creative and stimulating tools to support research and education.

7/ Fireside chat: Barbara Kathman and Gerrit Schipper

Barbara Kathmann was one of ECDA's early supporters and still takes a keen interest in our work. She is a member of the Dutch parliament and a former alderman for the economics of the municipality of Rotterdam. Here, we reflect on the conversation she had with Gerrit Schipper, executive director of ECDA, discussing how ECDA can be instrumental in Rotterdam's ambition to be an exemplary digital city by 2025

ECDA gave Rotterdam the opportunity to increase its knowledge of data and AI.

Barbara immediately kicks off the conversation with a question: "Why was it actually necessary to establish the Erasmus Centre for Data Analytics, and why did you think it important to involve the municipality in this?" That's an interesting question from someone who supported the foundation of ECDA from the very beginning, and she actually knows the answer, that ECDA was founded to support Erasmus University Rotterdam, its students and staff, and its public and private partners, in preparing for a sustainable data-driven future.

It is almost impossible to imagine life without artificial intelligence (AI) as a vehicle for a better future in which data is the fuel, and the algorithm that performs the analysis is the engine. And in order for this to run smoothly and trustworthily for our society, social partners must work together so involving the Municipality of Rotterdam was a no-brainer.

The municipality is responsible for the well-being of its citizens and after all, we are the university in Rotterdam; our Woudestein campus and the Erasmus Medical Center place us among those citizens. We can mean a lot to each other.

"Were you immediately taken by the idea when we came to you with it?", Gerrit asks.

"Certainly," says the former alderman. "At that time, we had just been working on the data-driven-working programme for a year. ECDA gave us the opportunity to increase our knowledge in the field of data and AI with a number of training courses, and that is exactly what we want: more knowledge of digitalisation in the broadest sense of the word, and data and AI are essential in this. Via ECDA, we also have direct access to the expertise of EUR and students working on the city's tasks. Moreover, we find this development very important in the city, especially if it is a Rotterdam development. With this in mind, the choice to become a partner was quickly made!"

Did Barbara know of examples of other successful collaborations between the municipality and EUR? She mentions EUR's Erasmus honours programme 'Tackling Inequalities' almost without hesitation. "The programme enables students to learn to think beyond the boundaries of their own academic disciplines, recognise different forms and manifestations of social inequality, and develop innovative solutions. Digitalisation offers many opportunities, but also leads to new forms of social inequality."

"Of course, technology is important, but people are more important, and our university can put people at the centre of it like no other We sometimes say we bring humans back into the AI.

Gerrit Schipper, executive director, ECDA

Gerrit is now curious, and asks Barbara: "If that is so important, how would you like to strengthen co-operation with us or with the educational institutions in general?"

"To be used by the educational institutions as a sounding board for issues surrounding new developments," she answers. "For example, in the Urban Big Data knowledge workshop, or introducing specific issues as the theme for a graduation research, and also having students do an internship at the Municipality of Rotterdam. And let's not forget that working together in European calls has already been quite successful. I think the European RUGGEDISED* programme, to which you as ECDA make a very important contribution, is a very good example of this."

Barbara falls silent for a moment, then says: "You just said that that data is the fuel for Artificial Intelligence and the algorithm with which the data is analysed is the engine of progress. That sounds like a lot of technology is involved. Is that right? What does a non-technical university like Erasmus University do with this?"

Barbara has touched on a major misunderstanding here, namely, that AI is only about technology. Of course AI has a technical impact – think of computers and robots. But AI also has a tremendous social impact that is perhaps even greater than its impact on technology. It affects the way in which people and companies will do business with each other, on functions and roles that will disappear, and new functions that will arise, applications that do and allow us to do often change radically, and so on.

The way in which algorithms can influence people's lives is often quite intense, as we have seen with the Dutch childcare benefits scandal (concerning false allegations of fraud made by the Tax and Customs Administration while attempting to regulate the distribution of childcare benefits). For a university in which business, economic and social sciences are researched and taught, research and education in AI are therefore also essential; think of ethics, legal basis, or psychology – everything is affected by AI.

"Of course, technology is important," says Gerrit, "but people are more important, and our university can put people at the centre of it like no other. We sometimes say we bring humans back into the AI." Gerrit doesn't actually think the term 'artificial intelligence' is correct either. He prefers to speak of 'augmented intelligence'. "It complements our thinking abilities and helps us make better decisions that keep us in the driver's seat. And this is how we want to position ourselves," he concludes, "a university that puts people first and carefully examines the social and economic impact of AI."

Barbara can agree with that. "Rotterdam wants to position itself as a city where the new possibilities of AI are applied in a responsible manner, which supports inclusion. The city has the ambition to be a digital example city by 2025. In this way, the city wants to achieve that digitalisation contributes in the most effective way to the social, economic and physical tasks of the city. Data is strategically important to stimulate innovation, to make new markets and business models work. AI is a crucial tool in this regard. Attention is also required for the responsible application of AI in terms of ethics, privacy and security."

"A nice ambition, but do you think that municipalities and also the central government have enough of an eye for these AI developments?" ask Gerrit. "And what about the role of big tech in this?"

Barbara answers: "There is only a very small group of representatives who have any knowledge of this. Fortunately, since last year there has been a permanent parliamentary committee on digitalisation that looks at the various aspects of digitalisation and development in a much more integrated way. The point is that you have to understand it before you can make good decisions about this. And that does not mean that the big tech can go about their business unchecked. See as an example in America where the big tech independently decides whether someone has access to his Twitter or Facebook account. Whether it is justified or not, we have to enter into a conversation about it."

"Do you therefore find it of value to the municipality to collaborate with a mix of public-private partners, technology, start-ups, academics and students in an ECDA learning community and ecosystem?" asks Gerrit.

"Certainly, as a municipality, we gain faster and better insight into the revolutionary developments and how these developments can support our ambitions for the social and societal – but also the economic – tasks of the city. It offers opportunities and possibilities, and we as a municipality are part of that, you have to participate: to learn, to inspire, sometimes to facilitate and perhaps also to regulate. If you give the learning community a good place in the city, it has enormous added value for all parties."

"Is that also the added value for the data and AI convergence between the various universities and university medical centers in this region?" Gerrit asks.

"Sure," she replies. "For example, digitalisation will lead to some disruption in healthcare. There are opportunities to use AI to improve the productivity of healthcare providers, to achieve better outcomes in healthcare provision, to achieve greater patient loyalty and to achieve better outcomes at the population level. The convergence can stimulate the digital transformation of healthcare in Rotterdam to lead to new business and to more and better valorisation of knowledge. It is a challenge to use the power of the strong combination of medical academic research, data scientists, engineers and healthcare in an economic sense as well."

She continues: “We would also like to use data and AI to solve some of the challenges in the Rotterdam Delta, such as energy transition, air quality, the health of citizens, and so on, but how. Do you have an answer for that?”

“I am afraid we have not enough time to answer that,” replies Gerrit. “I am optimistic and can also work for a fantastic university in a fantastic city and the examples you gave of our co-operation show what steps we are already taking and the results. Only I think this is not enough. We will have to go faster and invest more, otherwise, we will soon be behind the facts, as was the case with the Corona crisis before.”

“Can we learn something from the Corona crisis in terms of the use of data and AI?” asks Barbara.

“That we should better involve people in what data and AI can mean for us,” answers Gerrit. “Lack of knowledge and uncertainty is disastrous for acceptance. Be more clear about the pros and cons, but above all acknowledge that we don’t know everything yet. People often feel taken by surprise, but we have actually been using data analysis techniques for a long time. [We should] make visible where things went wrong and what we learn from them, but also – and especially – make visible where things went well and what benefits we have from it.

“It is precisely thanks to data and AI that we have been able to develop various vaccines at lightning speed, but because this was not properly explained, a lot of mistrust arose. I honestly think that data and AI offer the city great opportunities and I’m glad to hear that you think the same, Barbara.”

Barbara agrees: “Absolutely. As I said, Rotterdam has the ambition to be the digital model city by 2025. We would like to work with the parties in the city to realise a so-called ‘quadruple win’ in the field of digital applications that contribute to all those different and increasingly complex tasks that we have in a city like Rotterdam. In the quadruple helix, everyone has to win something. Only in this way can we benefit from digitalisation from citizens, the business community, knowledge institutions and the government.”

“Rotterdam wants to position itself as a city where the new possibilities of AI are applied in a responsible manner, which supports inclusion. The city has the ambition to be a digital example city by 2025.”

Barbara Kathman, vice-mayor Economy, The City of Rotterdam

** RUGGEDISED is a project to create sustainable and resilient cities for all, funded by the European Union’s Horizon 2020. www.ruggedised.eu*

8/ Partnerships

By sharing their challenges with datasets in business or operations, public and private organisations that partner with ECDA can expect a range of benefits in return.

In formal partnerships with a fixed term – usually about three years – we can act as a hub that propels both ends of the data analytics ecosystem forward: the data generators, and the data consumers.

Government, industry, and academic organisations all have different principles, models and aims. This is why ECDA has developed a collaboration model, available in a range of bundled packages, to facilitate collaboration between the three without compromising business' activities, the value of education for students, or the scientific independence of our research.

- **Being the subject of research**
  Public and private organisations that generate data and want to optimise its use so they become data-driven organisations, and are interested in collaborating with the university.

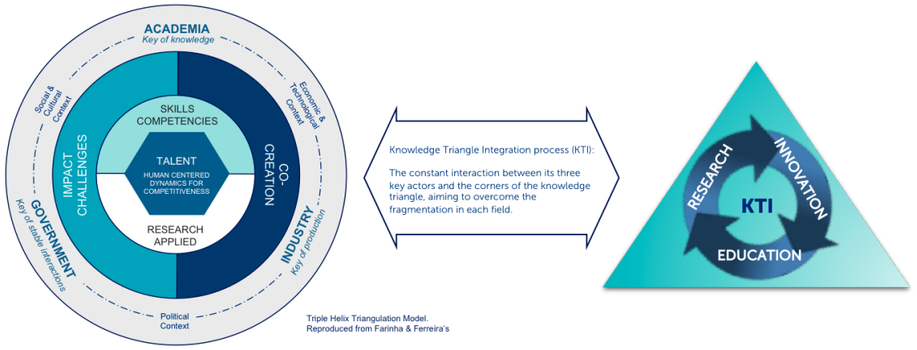
- **Enabling our research and education**
  For testing, education, and research, we welcome partners from technology companies that create data ecosystems. By making their technology, software and tools available to ECDA, they can be used in education and research.

In 2020, we also created informal partnerships and working relationships for smaller projects with a host of organisations. These have helped the organisations involved to progress, as well as adding to our experience and expertise, and have thus contributed to the field of data analytics.

Our partner organisations benefit from ECDA's knowledge, analytical skills and hands-on support.

They get:
- methodologies for analysing and visualising data;
- training and hands-on skills development for executives;
- expert knowledge of data governance so public and private partners can benefit from the digital transformation;
- access to the academic community, contact with engaged bachelor and master students, and EUR's international network of more than 40,000 alumni.

For more information about partnering with us, please find more details on our website:
www.eur.nl/ecda



Triple Helix Triangulation Model.
Reproduced from Farinha & Ferreira's

9/ Offerings

In touch with talent
Present your company to our students in various programmes, events and platforms.

Thought leadership
Get inspired by academic thought leaders and industry leaders in the field of data analytics.

Access to academics and alumni
Learn with alumni and interact with research fellows and the ECDA team.

Access to ECDA's data hacking community
Join crowdsourcing and data hacking events.

Education and training
From providing case studies to hosting senior executive briefings, we train leaders with the skills and competencies for tomorrow's business.

Engage with research
Raise research questions for master and PhD students that involve issues between industry, government and academia.

Erasmus Data Collaboratory
Join our founding partners in the development of a digital technology lab as a test bed for innovative methodologies. The Erasmus Data Collaboratory: ECDA's data visualisation lab and AI test hub hosted with founding partners, for identifying business opportunities and realising societal impact. *We are currently developing the Erasmus Data Collaboratory as a home for our library of algorithms, company data sets, use cases and minimum viable product developments, and for our workshops.*

10/ Partner comments and testimonials

Quint

Quint is a founding partner of ECDA. **Maurice Boon**, CEO, said: "Quint supports companies and organisations in designing and implementing their digital transformations. The ability to convert data into value is the key to the success of any digital transformation, and that is why we are a founding partner of the Erasmus Centre for Data Analytics."

Coolblue

Online retailer Coolblue is a founding partner and will work with ECDA for at least three years. **Pieter Zwart**, founder and CEO said: "At Coolblue, we measure everything. We continuously use this data to amaze our customers. As a partner of ECDA, we'll continue to exchange knowledge in the field of data analytics with academics and students. This won't only help us to become a little bit better with data every day, but it'll allow students to kick off their career by adding relevant analytical skills to their academic expertise. We want to challenge them to transform data challenges into even more happy customers."

Ahold Delhaize

Frans Muller, CEO Ahold Delhaize: "As a business, depending and relying om data, it is more and more important to have an holistic view on AI and data that also include alpha and beta sciences. It is great that with ECDA in Rotterdam we have those sciences available."
Keynote ECDA Data Summit 2020..

ING

ING is a founding partner of the Erasmus Centre for Data Analytics, and has ambitions to use advanced analytics in its operations globally; the bank believes that it's key to providing a smooth customer journey for its clients. **Annerie Vreugdenhil**, Chief Innovation officer ING. "Academic partnerships ensure that we are inspiring our people to innovate at the cutting edge, enabling them to build differentiating experiences for our customers. The Erasmus Centre for Data Analytics provided the ING team with the content, context and coaching necessary to actively contribute to our goals."

Philips

Frans van Houten, CEO Philips: "AI, data science can make a world of difference in this very complex world of difference in this very complex world of healthcare... I'm convinced ECDA has a very important mission to play."

Siemens

Executives from technology pioneer and founding partner Siemens took part in the eight-day leadership programme developed and delivered by ECDA. "For every organisation, public or private, this leadership challenge is an amazing opportunity to work on data analytics with outstanding professors in order to become a data-native organisation," said **Robin Kroonenberg**, former chief digitalisation officer at Siemens Nederland NV.

11/ Meet the team

Academic Directors

Prof. Ting Li is Endowed Professor of Digital Business at RSM and an expert in digital strategy, ecommerce, social media analytics, mobile marketing, business analytics, online advertising, and pricing and revenue management. She has been a Visiting Professor at the Wharton School of Business, Temple University, Arizona State University, City University of Hong Kong, and Tsinghua University. In 2017, she was named by Poets & Quants as one of the Top 40 Professors Under 40 Worldwide.

Prof. Gui Liberali is Endowed Professor of Digital Marketing at RSM, with a highly singular and distinct expertise in marketing analytics and advertising analytics. He focuses on concrete solutions, often based in marketing algorithms and mathematical optimisation models. These help organisations to identify the best actions for effectively increasing revenue, profits or market share. His research interests include optimal learning, multi-armed bandits, digital experimentation, natural language processing, morphing theory and applications (e.g., website morphing, ad morphing), dynamic programming, machine learning, and product line optimisation.

Prof. Wolfgang Ketter is Professor of Next Generation Information Systems at RSM and Chaired Professor at the University of Cologne, Cologne, Germany, where he is Director of the Institute of Energy Economics. He is also an agenda contributor to the World Economic Forum global future council on mobility, leading the discussion on autonomous systems, energy and mobility, and an advisor on energy policy to the German government.

Dr Dion Bongaerts is Associate Professor of Finance at RSM. He works on promoting and streamlining interdisciplinary academic research in FinTech, aligning it with the needs and interests of industry practitioners. He specialises in the behaviour of credit rating agencies, the pricing of credit risky instruments, and the origins and effects of market illiquidity. He represents RSM in the research project that was granted €3.3 million in late 2019 to start an online community of 50,000 internet users to evaluate the principles of an 'internet of trust'. The interdisciplinary Sovreignty4Europe project uses computer science, economy and legal knowledge in a system that uses a blockchain that allows anyone to assess their level of trust in a person or company.

Dr Yashar Ghiassi-Farrokhfal is Associate Professor Department at RSM and expert on energy systems, electricity markets, storage systems, market design and analysis, and city-wide energy planning.

Dr Iuliana Sandu is a senior lecturer at RSM, and specialises in audit, accounting and control analytics, at the crossroads between accounting and data science. She addresses accounting professionals' lack of technical expertise to deal with big volumes of diverse data, and data analysts' lack of domain expertise to identify the real needs of a business that are not always answered with a machine-learning algorithm. Her part in the team builds on the inherent advantages of the accounting profession to provide businesses with an insight into the quality of data, algorithms and their value for the business.

Prof. Peter van der Spek is Professor of Bioinformatics at the Erasmus Medical Center. Bioinformatics combines interdisciplinary data and resources, as well as expertise, and conducts biological studies that use computer programming as part of their methodology. These studies are used to identify candidate genes that are associated with a particular disease. This type of molecular biology techniques requires computer science expertise, information engineering, mathematics, and statistics to support the diagnostics of complex patients.

Prof. Klaus Heine is Professor of Law and Economics and director of the Jean Monnet Centre of Excellence on Digital Governance at the Erasmus School of Law. Digital Governance (DIGOV) is the name of the Jean Monnet Center of Excellence that has been awarded by the European Commission to the Erasmus School of Law. It is recognition of Erasmus School of Law's leadership in research into the legal consequences of technological disruption.

Prof. Liesbet van Zoonen is Professor of Sociology at the Erasmus School of Social and Behavioural Sciences. Her research focuses on three sub-themes: the use of data and digital technologies to aid vulnerable urban groups; enhancements of new forms of urban participation and governance; and development of urban data literacy and democratic legitimization. Her work for ECDA focuses on appropriate data governance and management, and particularly about the social, ethical and individual consequences of the urban data revolution for people in the city.

Dr Robert Rooderkerk is Associate Professor of Operations Management at RSM, ECDA Lab Director of the Retail Analytics expertise area, and Academic Director of RSM's MScBA Business Analytics & Management. His research addresses retail operations challenges on the marketing-operations interface, with an emphasis on omnichannel retail. He is particularly interested in research questions related to assortment, product lines, and fulfilment. His empirical work integrates insights from psychology and consumer behaviour with advanced analytics that include Bayesian statistics, econometrics and operations research. His conceptual work focuses on how new technologies, data sources, advanced analytics, and business models are reshaping the global retail landscape.

Prof. Stefano Puntoni is Professor of Marketing at RSM. He leads the Psychology of AI lab which examines the human side of data science. Most of Prof. Puntoni's ongoing research investigates how new technology is changing consumption and society, with a focus on automation, artificial intelligence, and the general topic of technological unemployment. He is a former Marketing Science Institute Young Scholar, a current Marketing Science Institute Scholar, and the winner of several grants and awards, including a Marie Curie Fellowship from the European Commission.

Prof. Payal Arora is Professor and Chair in technology, value and global media cultures at the Erasmus School of Philosophy. She is a digital anthropologist and author of several books. Her expertise is in bringing together tech platforms, digital marketeers, designers, thinktanks, and digital anthropologists to venture into the understanding of user behaviour and motivations alongside their socio-specific realities, tech affordances and legal and institutional structures.

Prof. Rob Zuidwijk is Professor of Global Supply Chains and Ports at RSM. His fields of expertise include co-ordination for sustainable global supply chains, synchromodal transport networks and inter-organisational systems in logistics. Professor Zuidwijk is also Captain of Science of the Topsector Logistics in the Netherlands and ambassador of Smart Logistics of SmartPort, a collaborative arrangement with the port community of Rotterdam.

Prof. Antoinette de Bont is Professor of Health Care Governance at the Erasmus School of Health Policy & Management. Her fields of expertise include national and international policy priorities, the transition of health care and the use of big data to increase efficiency in health care. Professor de Bont is also academic lead for the convergence Health & Technology and the EUR initiative Augmented Humanities with AI.

Prof. Moniek Buijzen is Professor of Communication and Behavioural Change at the Erasmus School of Social and Behavioural Sciences . Her fields of expertise include benefits of digital technology in a healthy and sustainable lifestyle, dissemination of health campaigns for youth, and peer influencers in online social networks. Professor Buijzen also leads the NWO-funded SocialMovez project.

Dr Jason Pridmore is Associate Professor and Vice Dean Education at the Erasmus School of History, Culture and Communication (ESHCC). His fields of expertise include digital identification, security issues, practical approaches to data protection, surveillance and the use of new and social media and consumer data..

Dr Bernold Nieuwesteeg is Director at the Centre for the Law and Economics of Cyber Security at the Erasmus School of law. His fields of expertise include cybersecurity, systems engineering and policy. Dr Nieuwesteeg is also co-founder of Cross-Over B.V.

Prof. Yvonne van Everdingen Is Professor of Marketing and Innovation at RSM. Her fields of expertise include marketing of new products, use of new technologies such as VR and AR for the development and launch of new products, and consumer adoption of sustainable new products. She is also a member of the EUR Diversity Advisory Board, member of the Special Interest Group Virtual Reality at the Erasmus Behavioural Lab, member of the Profgroep Onderwijs of the Expertise Center voor Marketing Insights, Onderzoek en Analytics, and the chair of the Jury for the MOAward Insights Scientist of the Year.

Dr Luca Berchicci is Associate Professor of Entrepreneurship and New Business Venturing at RSM. His fields of expertise include decision making in problem solving, firms' capabilities building, (green) innovation and business models, and machine learning algorithms for model uncertainty mapping. His primary interest lies at the intersection of strategy, entrepreneurship and innovation.

Prof. Dennis Fok is Professor of Econometrics and Data at the Erasmus School of Economics (ESE). His fields of expertise include econometrics, data science, machine learning, marketing, and high dimensional data. Professor Fok also advises companies and other organisations on research-related issues. He is the Director of the Econometric Institute at EUR, and the Academic Director of ESE's MSc in Business Analytics & Quantitative Marketing.

Dr Aurélie Lemmens is Associate Professor of Marketing Management at RSM. Her fields of expertise include customer analytics, machine learning, causal interference, and optimisation of managerial decisions such as customer targeting. She is the author of the recently developed ProfitBoost algorithm to optimise customer retention campaigns. Dr Lemmens was awarded several prestigious grants, including a Marie Curie grant from the European Research Council, and Veni and Vidi grants from NWO.

Prof. Bas Donkers is Professor of Marketing Research at the Erasmus School of Economics. His fields of expertise include consumer decision-making, behavioural economics, quantitative analysis, and quantitative market research techniques.

Core Team

Gerrit Schipper is Executive Director of ECDA. He has vast experience in senior management for blue chip and multinational organisations, and uses his skills as a networker and expert on management to establish long-term strategic collaborations with partners for ECDA outside the academic world, from public and private sectors. His sense of curiosity and awareness of future technologies means he can identify connections between ideas, people and companies, and make them happen.

Dr Marcel van Oosterhout is Associate Executive Director at ECDA. He has great experience in project development and project management, and is an active researcher involved in several national and EU-funded research projects on smart cities, sustainable energy and digital capabilities. He coaches master students in business information management. He initiates and develops innovative ideas and projects that bridge science and practice, and those that combine people, technology, knowledge and innovation.

Maaike Hang is Partner Engagement Manager at ECDA. She completed a Research MA in Asian Studies, and LLB in applied sciences. She is an experienced account manager and project manager, and is involved in partner engagement management with ECDA's corporate partners.

Rajarshi Chakraborty is Ecosystem Designer at ECDA. He completed an MSc in Business Information Management, is founder of Erasmus Tech Community, and co-host of the Speed Change Repeat podcast.

Max Gebski is Partner Associate at ECDA. He is an honours bachelor student of International Business Administration at RSM with interests in machine learning, deep learning, data science and web and software development.

Orsi Bardos is Marketing and Events Coordinator at ECDA. She is a third year International Business Administration student at RSM and future Sports Management Master student at ESBS with interests in design, marketing, and sociology.

Colophon
Design: DDK Utrecht, content and design **Photography:** Chris Gorzeman, Rotterdam make it happen: Iris van den Broek, Claire Droppert, Shutterstock, 123RF

Founding partners

Erasmus Centre for Data Analytics
Erasmus University Rotterdam
Burgemeester Oudlaan 50
3062 PA Rotterdam
The Netherlands
+31 10 408 23 15

eur.nl/ecda

Erasmus Centre for Data Analytics