



Utrecht University Graduate School of Life Sciences Utrecht – The Netherlands

Title The impact of the metabolic status of the mother on embryo quality

Name Principal Investigator: Dr Hilde Aardema, Dr Peter Vos and Dr Bart Gadella

Institute or Department: Farm Animal Health

Research Programme: [Fertility & Reproduction](#)

Website: <https://www.uu.nl/staff/HAardema>

Short Description of Research Area

Metabolic stress condition, like obesity, diabetes-type II, but also a negative energy balance, are related with reduced fertility in both human and animal. The metabolic condition is reflected at the level of the genital tract and can also affect the quality of the oocyte and embryo. A major characteristic of metabolic stress conditions are elevated levels of free fatty acids (NEFAs) in the circulation, which also results in an increase in the level of NEFAs in the follicular fluid that surrounds the cumulus-oocyte-complex (COC). We demonstrated that in particular saturated NEFAs have a dose-dependent negative impact on the competence of the oocyte to develop into an embryo (Aardema et al., Biol of Reprod, 2011). Interestingly, the relatively high level of mono-unsaturated oleic acid and the surrounding cumulus layer can protect the oocyte against lipotoxicity (Aardema et al., Biol of Reprod, 2011, 2013 and 2017). However, how the metabolic condition of the mother affects the embryo that resides in the oviduct is unknown. Furthermore, studies of the “Dutch Hunger Winter” between 1944-1945 demonstrate that the metabolic condition of the mother during the periconception period had a lifelong impact on the offspring via epigenetic modifications* (Heijmans et al., PNAS, 2008). In the current project we will focus on the interaction between the oviduct environment and embryo during metabolic stress conditions. In our *in vitro* embryo culture laboratory the student will design experiments, based on the metabolic conditions in the oviduct, to unravel the mystery of early life.

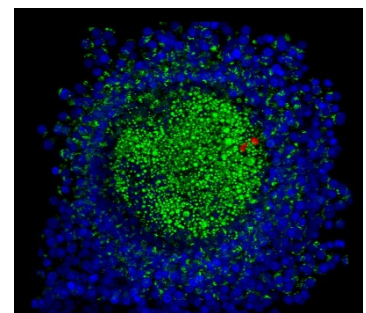
*“Epigenetic changes, such as [DNA methylation](#) and [histone modification](#), alter how genes are expressed without altering the underlying [DNA](#) sequence”

Keywords

Embryo, oviduct, metabolic stress, NEFA, oocyte

What do we offer

An inspiring research environment at the faculty of Veterinary Medicine in a group of researchers with a focus on oocyte and embryo development. The group is embedded in an international group of collaborators and international contacts. You will be working with state of the art techniques, like bisulfite sequencing for epigenetic analysis, fluorescent confocal microscopy and a 3D-oviduct system (Ferraz et al., Nat Commun, 2018).



Fluorescent detection of the cumulus-oocyte complex. DNA cumulus cells (blue), DNA oocyte (red) and lipid droplets (green).

We offer a full-time position for 4-years at the Reproduction division of the Department of Population Health Sciences, division Farm Animal Health that should result in a PhD thesis. Your thesis will comprise 4-5 published papers, preparing you for a next step in your career!

What are we looking for

An enthusiastic and creative candidate with a MSc degree in biomedical sciences or veterinary sciences, preferably with skills in developmental biology. You are a team player with excellent social and English speaking/writing skills and interested in working in a multidisciplinary research group.

References

- Aardema H, Vos PL, Lolicato F, Roelen BA, Knijn HM, Vaandrager AB, Helms JB, Gadella BM. 2011. Oleic acid prevents detrimental effects of saturated fatty acids on bovine oocyte developmental competence. *Biology of Reproduction*, 85:62-69. doi:10.1095/biolreprod.110.088815.
- Aardema H, Lolicato F, van de Lest CH, Brouwers JF, Vaandrager AB, van Tol HT, Roelen BA, Vos PL, Helms JB, Gadella BM. 2013. Bovine cumulus cells protect maturing oocytes from increased fatty acid levels by massive intracellular lipid storage. *Biology of Reproduction*, 88:164, 1-15. doi:10.1095/biolreprod.112.106062.
- Aardema H, van Tol HTA, Wubbolts RW, Brouwers JFHM, Gadella BM, Roelen BAJ. 2017. Stearoyl-CoA desaturase activity in bovine cumulus cells protects the oocyte against saturated fatty acid stress. *Biology of Reproduction*, 96:982-992. doi:10.1095/biolreprod.116.146159.
- Aardema H, van Tol HTA, and Vos PLAM. 2019. An overview on how cumulus cells interact with the oocyte in a condition with elevated NEFA levels in dairy cows. *Animal Reproduction Science*, 207:131-137. doi.org/10.1016/j.anireprosci.2019.06.003
- Heijmans BT, Tobi EW, Stein AD, Putter H, Blauw GJ, Susser ES, Slagboom PE, Lumey LH. 2008. Persistent epigenetic differences associated with prenatal exposure to famine in humans. *Proc Natl Acad Sci U S A.*, 105:17046-9. doi: 10.1073/pnas.0806560105
- Ferraz MAMM, Rho HS, Hemerich D, Henning HHW, van Tol HTA, Hölker M, Besenfelder U, Mokry M, Vos PLAM, Stout TAE, Le Gac S and Gadella BM. 2018. An oviduct-on-a-chip provides an enhanced in vitro environment for zygote genome reprogramming. *Nature communications*, 9:4934. doi: 10.1038/s41467-018-07119-8.

VU PhD Programmes and Offers

Please visit www.vu.nl for more

I Dr. Joen Luirink

I am group leader of the Department of Molecular Microbiology, Amsterdam Institute of Molecular and Life Sciences. The research focus of my academic group is on the mechanisms of protein trafficking in bacteria. How do proteins move towards their destination, how do they insert in membranes, how are they secreted into the environment or into the host? To elucidate these mechanisms, we use primarily biochemical and molecular biology approaches with strong links to structural biology labs.

How do proteins move towards their destination, how do they insert in membranes, how are they secreted into the environment or into the host? To elucidate these mechanisms, we use primarily biochemical and molecular biology approaches with strong links to structural biology labs.

We also always have a keen eye on potential applications of our fundamental work. These applications mostly concern the development of antibiotics and vaccines but also more efficient protein production processes for biotechnology. For instance, based on our studies on a specific protein secretion system, we have created a platform for high density surface display of antigens for the development of live vaccines and derived Outer Membrane Vesicles (OMVs).

This exploitation is done in the context of the spin-off company Abera Bioscience of which I am CSO. Additionally, we work hard to develop inhibitors that interfere with the biogenesis of the bacterial cell envelope, inhibitors that may serve as a novel class of antibiotics.

Recruiting Interest

We are recruiting students with an interest in Microbiology, Biochemistry and Molecular Biology. The project concerns the development of assays to screen for inhibitors of the biogenesis of the bacterial cell envelope that are expected to affect growth and hence can be considered novel antibiotics, urgently needed to combat pathogens that have become resistant to current antibiotics.

We offer a highly stimulating, internationally oriented research environment with top notch technical infrastructure. More than half of our PhD students and post-docs are from abroad. Our graduate school offers various courses in soft and hard skills. During the PhD Workshop China Dutch Virtual Event you can contact Dr. Joen Luirink via Skype (username joenluirink).

Read more about the Amsterdam Institute of Molecular and Life Sciences

<https://www.aimms.vu.nl/en/index.aspx>

II Prof. Dr. Erik Verhoef

Congestion, environmental pollution, big city problems like housing and crime, these are some of the topics that we study at the Department of Spatial Economics at Vrije Universiteit Amsterdam.

Our department is engaged in economic problems in which space plays a prominent role, and offers insights and applications in urban, regional, transport and environmental challenges from an economic perspective, often enriched through multi-disciplinary collaborations.

According to RePEc (accessed in April 2020), our department ranks in the top 5% of institutions worldwide in the fields of Transport Economics, Urban and Real Estate Economics, Economic Geography, Environmental Economics and Energy Economics.

PhD students are most welcome to stay and work with us. Do you want to know more? Visit our blog <https://spatialeconomics.nl/en/>, or join us on facebook, linkedin or twitter.

Erik Verhoef graduated in Economics at the University of Groningen (1991), and obtained a PhD in Economics at VU Amsterdam on a thesis entitled “The regulation of road transport externalities”. He is now affiliated as a full professor in Spatial Economics at this same university, and as a research fellow at the Tinbergen Institute. He has been Vice (Research) Dean of the School of Business and Economics, and is currently Head of Department of Spatial Economics, both at VU Amsterdam. Erik Verhoef's research focuses on efficiency and equity aspects of spatial externalities and their economic regulation, in particular in transport, urban and spatial systems. Important research themes include second-best regulation, network- and spatial analysis and methodological development, efficiency aspects versus equity and social acceptability, industrial organization in network markets, valuation and behavioural modelling, and policy evaluation. He has been involved in various national and international research consortia. His research is at the interface of welfare-, micro-, transport-, urban-, spatial- and environmental economics. He has published various books and numerous articles on these topics.

III Prof. Dr. Andreas Freise

Andreas Freise's research focuses on instrumentation for gravitational-wave observatories, with a special focus on optical design and interferometry. Andreas Freise has been a member of the gravitational wave community since 1998 when he started working at the GEO 600 detector. He received his PhD from the Albert-Einstein Institute in Hannover (2003) and moved on to help complete the Virgo detector in Pisa (2003-2005) before becoming a faculty member at the University of Birmingham. There he joined the LIGO Scientific Collaboration and eventually became Professor of Experimental Physics and Deputy Director of the Institute for Gravitational Wave Astronomy. Freise pioneered the development of numerical simulations that are essential for the design and commissioning of large laser interferometers. He developed the software FINESSE that is now one of the most widely used interferometer design tools in the field.

Andreas Freise has recently joined the Vrije Universiteit Amsterdam and Nikhef as Professor of Gravitational Wave Physics, his group is contributing to the Virgo project and Andreas continues his efforts to realise the Einstein Telescope, for example, as a member of the ET steering committee and by leading the detector design as the co-chair of the Instrument Science Board.

Andreas Freise has successfully supervised 12 PhD projects, including two CSC-funded projects. For example, the research from the CSC-funded projects has been published in the following articles:

H. Wang et al.: 'Feasibility of near-unstable cavities for future gravitational wave detectors', Phys. Rev. D 97, 022001 (2018)

H. Wang et al.: 'Thermal modelling of Advanced LIGO test masses', Classical and Quantum Gravity, 34, 115001 (2017)

M. Wang et al.: 'Sensitivity of intracavity filtering schemes for detecting gravitational waves', Phys. Rev. D 89, 062009 (2014)

M. Wang et al.: 'Realistic polarizing Sagnac topology with DC readout for the Einstein Telescope', Phys. Rev. D 87, 096008 (2013)

Read more about the department of Physics and Astronomy

<https://www.nat.vu.nl/en/index.aspx>

IV Prof. Dr. Rob Leurs

Rob Leurs is a full professor of Medicinal Chemistry at Vrije Universiteit Amsterdam in the Netherlands.

His research team covers areas in molecular and cellular pharmacology with a focus on GPCRs and phosphodiesterases, drug design and synthesis and computation drug discovery. Lately, the group has focused e.g. on new concepts of photopharmacology and the development of new drugs against Neglected Tropical Diseases, malaria and cancer.

He published over 350 articles in international peer-reviewed academic journals, applied for several patents, is an elected member of the Royal Netherlands Academy of Arts and Sciences and founder and director of a small startup company in the area of drug discovery.

Potential Ph.D. topics

1. Design and Synthesis of new photoswitchable GPCR ligands for students with a background in Chemistry and interest in GPCR drug discovery.
2. Biased GPCR signaling by GPCR isoforms in order to develop more selective GPCR therapeutics for students with a background in molecular and cellular pharmacology.
3. Virtual screening for new GPCR ligands for students with a background in Computational Sciences and interest in drug discovery.

4. Expression and characterization of parasitic phosphodiesterases for hit finding in Neglected Tropical Diseases and/or the design and synthesis of new inhibitors for parasitic PDEs for students with a background in Chemistry and/or interest in drug discovery biology.
5. Targeting GPCRs in Schistosomiasis for students with a background in Chemistry and/or interest in drug discovery biology.

V Prof. Dr. Svetlana Khapova

Svetlana Khapova is a full-professor of Organizational Behavior at the School of Business and Economics (SBE) of the Vrije Universiteit Amsterdam in the Netherlands. She is Head of Management & Organization Department, and Head of the Research Group HRM & Organizational Behavior. Between 2009-2017, she served as a founding Director of Amsterdam Business Research Institute (ABRI). ABRI caters for doctoral education in management and organization studies at VU. Professor Khapova's research focuses on careers, employability, and employees' proactive behavior at work. Internationally, she is known for her work on "the boundaryless career" concept. Currently, she is working on extending her research to examining effects of individual career behaviors on a diversity of individual and organizational outcomes.

Among relevant individual outcomes are well-being, (mental) health, work engagement, creativity and entrepreneurship. Among relevant organizational outcomes are firm performance, new venture creation, team performance.

Professor Khapova held leadership positions at the Academy of Management between 2009-2013, serving as a Division Chair and Program Chair of Careers Division. She also organized and chaired many international conferences on the topic of careers, and co-convened the careers sub-tracks of the European Group for Organizational Studies (EGOS). In 2021, together with her colleagues, Professor Khapova will host EGOS conference in Amsterdam.

Potential PhD topics

1. Careers, employability, job-search, effects of pandemic on individual careers and employment
2. Team behaviors, collaborations and inclusion at the times of pandemic and beyond
3. Extending understanding of leadership in light of AI and Big Data

Publications

Personal brand equity: Scale development and validation. Gorbatov, S., Khapova, S. N., Oostrom, J. K., & Lysova, E. I.

Personnel Psychology, (2020, in press).

Entrepreneurial passion diversity in new venture teams: An empirical examination of short- and long-term performance implications.

de Mol, E., Cardon, M. S., de Jong, B., Khapova, S. N., & Elfring, T.

Journal of Business Venturing, 35(4), (2020).

Enacting creative calling when established career structures are not in place: the case of the Dutch video game industry.

Lysova, E. I., & Khapova, S. N.

Journal of Vocational Behavior, 114, 31-43, (2020).

An intelligent career: Taking ownership of your work and your life.

Arthur, M. B., Khapova, S. N., & Richardson, J.

Oxford University Press, (2017).

Career success in a boundaryless career world.

Arthur, M. B., Khapova, S. N., & Wilderom, C. P.

Journal of Organizational Behavior, 26(2), 177-202, (2005).

Read more about Professor Khapova's work: <https://research.vu.nl/en/persons/sn-khapova>

VI Dr. Senja Barthel

I am an assistant professor at the Mathematics Department of the Vrije Universiteit Amsterdam. I am searching for someone working on PhD level with me. I accept research visits of at least 6 month but can also support an entire PhD.

We study in how far rigidity theory from graph theory can be used to predict the flexibility of metal-organic frameworks. Rigidity theory studies the flexible modes of graphs. Metal-organic frameworks are a class of materials that consist of metal centers and organic linkers. They are potentially interesting for applications because they are porous. We want to investigate the flexibility of these materials by modelling their molecular bond network by a graph that respects the chemical constraints in flexibility using rigidity theory. The project can contain a computational part.

PROFESSIONAL BACKGROUND

Mathematics, applied and pure: Topological graph theory, mathematical modelling in materials science

ACADEMIC BACKGROUND

PhD from Imperial College London

Diplom from TU Berlin

Research experience from Waseda university Tokyo and Ecole polytechnique federale de Lausanne Switzerland

I have been a member of mathematics departments, chemistry and chemical engineering department

INTERESTS

Chemistry, Materials Science, Graph Theory, Applied mathematics, Materials modelling, Topology, Mathematics, Energy materials

VII Dr. Christiaan de Kock

Associate Professor Department of Integrative Neurophysiology, Center for Neurogenomics and Cognitive Research (CNCR), Vrije Universiteit Amsterdam

Number of peer-reviewed publications: 46

(a.o. Nature Neuroscience 2x, Neuron 1x, Nature Communications 2x, PNAS 2x, Cerebral Cortex 9x, Journal Neuroscience 7x, etc).

Google scholar: 3495 citations

h-index: 30

Associate Editor Frontiers in Neuroanatomy

Associate Editor Frontiers in Synaptic Neuroscience

Guest editor of Special Issue in IBRO Journal NEUROSCIENCE: “Barrel Cortex Function” (volume 1, 2018), associated to the international conference BACOFUN, Amsterdam 2016.

Research Statement

My research ambition is to elucidate the link between structure and function of identified cell-types to contribute to the construction of a comprehensive knowledge graph on the building blocks of mammalian brains.

This is achieved through cross-scale analysis of function of identified cell-types, ranging from single cell and population in vivo electrophysiology and imaging, to causality studies where interference using circuit manipulations lead to predictive manipulations of behavior.

Open Positions

Inquiries from talented and motivated students to work on various aspects of our research are strongly encouraged to apply. We offer a working and learning environment where a team of 5-10 enthusiastic scientists works together, collectively learn and as a group push the frontier of what we understand about signal processing in the brain and the link between cell-types, neuronal circuits and behavior.

Project Description

Our brain consists of a vast collection of cell-types, each with a wide range of structural and functional properties. It remains largely enigmatic however how individual cell-types orchestrate behavior, which frustrates a comprehensive understanding of brain function in health and disease. This may explain in part why mental health issues affect over 400 million people around the world at great cost to the economy due to productivity loss as well as health-related burden.

In this project, we aim to study the function of the main (Layer 5) output cell-types of the cortical microcircuit which are involved in behavior that emerges from processing sensory information. We will exploit state-of-the-art genetic tools to study the electrical activity of the two Layer 5 cell-types in cortical brain regions for sensory and associative (sensory+motor) signals in behaving rodents.

Next, we will use a different but comparable toolkit of genetic methods to electrically silence these output cell-types and read-out the consequence of this approach on learned, sensory-guided decision making. Finally, we will translate our findings to human brain and study the functional and wiring properties of the very same cell-types in living brain samples of human patients undergoing brain surgery for treatment of epileptic seizures or tumor.

Detailed understanding of cell-type specific function, underlying brain areas, and cross-scale analysis across species has the potential to inspire the development of novel, effective therapeutic strategies to tackle mental health issues.

Requirements

We are looking for PhD candidates with a master in neuroscience and a strong motivation to pursue a career in science. Previous experience with

1. slice or in vivo electrophysiology, or
2. imaging techniques or
3. digital reconstruction of neuronal morphology is essential.

Learn more about the research team In Vivo Neurophysiology

https://inf.cnr.nl/research_teams/in_vivo_neurophysiology/

VIII Prof. Dr. Ir. Kees van Gestel

Professor of Ecotoxicology of Soil Ecosystems at the Department of Ecological Science, Faculty of Science of the Vrije Universiteit Amsterdam

The Department of Ecological Science of VUA (<https://www.amsterdamecology.nl/>) is working on different ecological questions, among others regarding the responses of organisms to environmental change and to stress factors. We seek explanations for the evolution and diversity of traits by integrating molecular, organismal and community perspectives. One of the stress factors investigated is chemical pollution. We are studying the effects of toxicants on different soil invertebrates (e.g. earthworms, enchytraeids, springtails). Responses at the individual level (survival, growth, reproduction) are translated to effects on populations, communities and ecosystem function using multi-generational exposures as well as mesocosm experiments. Final aim is determining the ecological relevance and possible consequences for ecosystem services of the tested chemicals.

The PhD study we offer will focus on effects under field-relevant conditions of exposures to (dynamic) mixtures of pesticides (simulating a growing season) and taking into account the influence of fluctuating environmental conditions.

PROFESSIONAL BACKGROUND

Working on the effects of chemicals in soil, with focus on pesticides. Focus is on toxicity to individual species of soil invertebrates but also on the risk to populations and communities. Also involved in the risk assessment of chemicals.

ACADEMIC BACKGROUND

Working on soil ecotoxicology already for almost 35 years, with over 325 papers published in international peer reviewed journals and > 35 PhD students supervised in successfully completing their studies. Teaching Ecotoxicology at different levels (BSc, MSc, PhD).

IX Prof. Dr. Peverelli

School of Business and Economics, Vrije Universiteit Amsterdam

Peter Peverelli combines different fields of expertise. Learning Chinese since age 14, he studied Chinese Language and Culture at Leiden University (1974 – 1979), included a year in China (1975 – 1976). He received his PhD Lit. in 1986.

After a period of academic work in Leiden (1979 – 1982) and Beijing University (1982 – 1984), he started working for a Dutch company in 1985. He was stationed in China for the company from 1986 to 1991, after which he established his own consulting practice, advising Western companies in their long term relations with Chinese partners. Meanwhile, he had developed an academic interest in business administration, which led to a second PhD in that field at Erasmus University Rotterdam in 2000.

Dr. Peverelli joined Vrije Universiteit the year after, also continuing his consulting practice. He is affiliated with SBE, but more recently also has taken on the responsibility for the China business for the entire university in the International Office, in particular the recruiting of Chinese PhD Candidates.

Recently, Dr. Peverelli got affiliated with the Cross Cultural Human Rights Centre. He is currently working on making a cross-cultural business model applicable to human rights. Dr. Peverelli accompanied a group of VU students doing market research in Colombia in April 2019.

X Dr. Sandra Hasanefendic

Sandra Hasanefendic is an assistant professor in Science Business and Innovation Division at the Faculty of Science of the Vrije Universiteit Amsterdam where she teaches on topics related to innovation, tech commercialization and tech reappropriation in the life science industry.

Her research focuses on scientific and research valorization processes, technological readiness in the life sciences, specifically in countries such as China, South Africa and the US. Sandra has also been a director for international PhD recruitment where she expanded the university's strategy in internationalization for doctoral education. Previously, she worked as a research associate at the Technical University Lisbon and did a double PhD at ISCTE-IUL Lisbon Portugal and Vrije Universiteit Amsterdam.

Potential PhD topics (all projects are interdisciplinary)

1. Tech re-appropriation for artificial intelligence-aided drug repurposing
2. Sustainability in drug development: drug repurposing and the open collaboration model
3. Increasing drug efficacy: Tech re-appropriation of phototherapy
4. Open innovation in neuroscience research and drug discovery

XI Dr. David Dulin

PhD project on SARS-CoV-2 replication using magnetic tweezers in the Dulin lab

COVID-19 represents a major health concern for humanity, with almost one million death worldwide to date. The virus responsible for this pandemic is the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), against which we currently have no therapeutics. One of the main target for antiviral drugs is the viral replisome. SARS-CoV-2 replisome is a complex molecular machinery made of several proteins, e.g. the polymerase nsp12, the associated factors nsp8 and nsp7, a helicase nsp13 and the exonuclease nsp14, and most remains to be discovered concerning their exact role during RNA synthesis. The successful student will investigate SARS-CoV-2 replication in vitro, using state of the art single molecule biophysics techniques, such as magnetic tweezers. The student will benefit from the extensive expertise on coronavirus replication and single molecule biophysics of the Dulin lab, as well as from the thriving and world class environment of the Physics of Living Systems Section at the VU.

BRIEF BIO

I am an assistant professor at Vrije Universiteit Amsterdam (VUA) at the Physics of Living System section of the Physics Department. I am an expert in the study of genome expression and maintenance at the single molecule level using magnetic tweezers and single molecule FRET. In particular, my lab has a strong focus on RNA virus and SARS coronavirus 2 replication. I have been a group leader at FAU Erlangen-Nuremberg (Germany) for four years and I will start at the VUA in January 2021.

PROFESSIONAL BACKGROUND

January 2021: assistant Prof. at VUA (the Netherlands); September 2016-September 2022: Group Leader at FAU Erlangen-Nuremberg (Germany); September 2014-June 2016: postdoc at University of Oxford (UK); November 2009-August 2014: postdoc at TU Delft

ACADEMIC BACKGROUND

September 2006-October 2009: PhD in biophysics at University Paris XI 2000-2006: BSc-MSc Physics-math at University of Bordeaux.

INTERESTS

single-molecule, RNA virus, Coronavirus, replication, transcription, antiviral drugs, SARS-CoV-2, Biophysics

XII Prof. Dr. Heleen Slagter

Professor in Cognitive Neuroscience, Department of Experimental and Applied Psychology

The Cognition & Plasticity laboratory headed by Prof. dr. Heleen Slagter at the Vrije Universiteit Amsterdam is looking for motivated PhD students interested in pursuing a PhD in Cognitive Neuroscience. Research in the lab aims to enhance understanding of the neural

mechanisms that underlie perception, attention and consciousness, and their plasticity or ability to change as a function of new learning. PhD students have the opportunity to gain experience with state-of-the-art methods (EEG, fMRI) and analyses techniques (e.g., multivariate decoding, connectivity analyses) in a world class research environment. The lab is located in the Department of Applied and Experimental Psychology, and part of the Institute for Brain and Behavior.

For more information, please visit www.heleenslagter.com or <https://www.vupsy.nl/>

XIII Prof. Dr. Ir. Alexandru Iosup

Our society depends today on computer systems. The Internet, banking, healthcare, energy management, ICT operations of SMEs and large organizations, media and web services, online games and social media, and even governance, are elements of a Digital Economy in which massive computer systems, such as modern datacenters, combine with edge devices closer to the client, to serve as factories producing services with massive consumption. Radical changes in both workloads and infrastructure, especially post-Moore's Law, drive our work at the core of modern computer science.

The Massivizing Computer Systems research group at the VU is concerned with the design, implementation, deployment, analysis, and benchmarking of computer (eco)systems for which the resources, users, and/or workloads are massive in nature. This is a rich research field, with grand challenges including distribution of computation, heterogeneous computing, ecosystem orchestration, high performance, elastic scalability, high dependability, energy and other forms of efficiency, etc. We combine techniques from distributed systems, software engineering, performance engineering, and data management; we publish in top conferences and journals and our research has high impact. We apply the results of our research to cloud and edge computing, big data, and other higher-level computer systems, and also to important societal applications such as scientific computing, machine learning for decision making, business-critical workloads, and online gaming.

Our work is award-winning, both nationally and internationally. We play an essential role in organizing and developing the community, e.g., we often organize the top conferences in the field. The Professor in the group is member of the Netherlands Royal Academy of Arts and Sciences, which allows us to promote the interests of computer science at the top policy level. We also train top talent in the Netherlands, diverse people who later become leaders in the computing industry and in the academia.

Our website: <http://atlarge.science>

Prof. Iosup's curated list: <https://dblp.uni-trier.de/pid/85/2489.html>

XIV Dr. Ad van Dommelen

Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam

IVM's high level PhD programme is directly supervised by staff from the following four IVM departments: Environmental Economics; Environmental Geography; Environmental Policy Analysis; and Water & Climate Risk. IVM's educational philosophy is to train students with excellent academic backgrounds to address real-life sustainability problems and to prepare them for successful careers in research or in the public, private and civil society sectors. Typical environmental and sustainability themes that IVM specializes in include: climate change, clean & renewable energy, water governance, climate modelling and extreme events such as floods and droughts, ecosystem services & biodiversity, food security & sustainability, and environmental behavior.

All PhD students are supervised by at least one professor and one senior researcher. PhD research subjects are embedded in the research projects of the four IVM departments. A PhD student at IVM is embedded in an international atmosphere, as we host over 50 PhD students and 200 MSc students from all over the world.

The IVM PhD Programme offers opportunities for high-quality graduates leading to a doctorate; excellent supervision by senior researchers, membership of IVM's research community; a training programme, including courses at VU Amsterdam, as well as through our SENSE graduate school and other research schools, such as the Tinbergen Institute; a personal desk and computer facilities; access to student facilities at VU Amsterdam such as libraries; sports facilities and cultural activities; and assistance in arranging accommodation and visas.

For further questions, please visit <http://www.ivm.vu.nl/en/index.aspx> or contact us at info.ivm@vu.nl.

XV Prof. Dr. Ir. Fabio Massacci (Email: f.massacci@vu.nl)

Chair of Foundational and Experimental Security, Vrije Universiteit Amsterdam

Fabio Massacci (MEng'92, PhD'98 Computer Engineering, MA'95 in International Relations), married with two children, has been in Rome, Cambridge, Toulouse, Trento, and Amsterdam. He held visiting positions in Durham, Koblenz, Lueven, Marina del Rey, and Oslo.

He is one of the few professors who has presented in top hackers' venues (BlackHat USA, Asia), top computer security conferences (ACM CCS, IEEE S&P), top empirical software engineering journals (ESEJ, IEEE TSE) and top risk analysis journals (Risk Analysis).

For his work on security and trust in socio-technical systems he has received the Ten years Most Influential Paper Award by the IEEE Requirements Engineering. He has coordinated several European projects (including a multidisciplinary projects with economist, sociologists and computer scientists on socio-economic aspects of security SECONOMICS). He is the coordinator on the H2020 AssureMOSS project on open source security risk assessment and certification ("Written everywhere, Secured in Europe").

While almost all professors are sellers of technologies (through their papers or their spin-offs) he was for 7 years deputy rector for ICT procurements and services supervising a 70+ workforce and several millions Euro in outsourcing contracts. This made him a buyer of computing technology and a user of risk analysis. His perspective of what is a useful security technology or a useful risk analysis is shaped by this experience and very diverse: prestigious corporations are not longer (only) the place to send your > students or funders of your research, they are sloppy suppliers selling overpriced products.

He actively participated to civil society. He worked as a volunteer with underprivileged people and in refugee camps. He held, among others, the post of European Executive member and Treasurer of Service Civil International an international NGO with consultative status at UNESCO and the European Youth forum. For his MA he wrote a dissertation on the cooperation between democracies and social Islamic movements (instead of funding Saudi princes). He qualified at the world-wide competition to become a U.N. Officer but eventually opted to be an Assistant Professor.

More about Fabio Massacci at <https://fabiomassacci.github.io/>

Research Highlight

1. Empirical Security and Software Engineering

IEEE Transactions on Software Engineering, TSE-2020 (joint with SAP) Vuln4Real: A Methodology for Counting Actually Vulnerable Dependencies (to appear)

ACM Computers and Communication Security CCS-2020 A Qualitative Study of Dependency Management and Its Security Implications

Empirical Software Engineering Journal ESEJ-2020 (joint with TU/e and UMilano),

Measuring the accuracy of software vulnerability assessments: experiments with students and professionals

2. Risk Analysis and Policy

Risk Analysis RAJ-2020 (joint with Durham Business School and KIPA) Who Should Pay for Interdependent Risk? Policy Implications for Security Interdependence Among Airports

Risk Analysis RAJ-2018 (joint with TU/e) Security Events and Vulnerability Data for Cyber Security Risk Estimation

IEEE Security and Privacy Magazine SPM-2020 (joint with TUDelft) Governance

Challenges for European Cybersecurity Policies: Stakeholder Views

3. Crypto and Fintech

IEEE Security and Privacy Magazine SPM-2020 on Distributed Financial Exchanges: Security Challenges and Design Principles

IEEE Symposium on Security and Privacy SSP-2018 (joint with Durham Business School) on FuturesMEX: secure, distributed futures market exchange. Also an EU/US Patent Application

Interested in new positions? I am always interested in getting new candidates (either in Trento or in Amsterdam). Contact me with a specific proposal and make sure you have at least skipped some of my papers.

For Chinese Students please consider the opportunities offered by the VU Fellowship by the Chinese Scholarship Council.

Read more about Research Topics for the China Scholarship Council Applications

<https://fabiomassacci.github.io/nsfc.html>

XVI Dr. Ir. Jasper van Vliet

Jasper van Vliet is an Associate Professor in Land Use and Urban Development. In his research he aims to better understand land use change and urban development processes and their consequences at scales ranging from local to global.

The multi-scale approach underlying his research builds on a range of methodological approaches, including case studies, systematic reviews, spatial analysis, and land use modelling.

Ongoing work is mainly directed towards a better (spatial) characterization of urban land, for example in terms of 3D building structure, urban land use activities, and social and economic development. To that effect he builds on earth observation data, spatial analyses, machine learning, and statistical databases.

For more information, please look at the profile on the VU university website:

<https://research.vu.nl/en/persons/j-van-vliet>

XVII Prof. Dr. Ir. Bart Bossink (Email: b.a.g.bossink@vu.nl)

Bart Bossink is a full professor of Science, Business & Innovation at Vrije Universiteit Amsterdam in the Netherlands.

His research covers innovation and sustainability in corporate and institutional organizations, small and medium-sized enterprises, and start-ups.

He published over 60 articles in international peer-reviewed academic journals, wrote eight books for research, educational and professional purpose, regularly serves as an advisor of Dutch governmental bodies, and presented various programs on Dutch national television about business innovation.

Potential Ph.D. topics

1. Sustainable energy demonstration projects: organization, strategy, and innovation processes of clean and sustainable energy technology development and commercialization in pilots and demonstrations.
2. Personalized medicine: tailoring tomorrow's healthcare (drug development, therapy offering, organization of the healthcare system) towards the personal needs of citizens and patients.
3. Circular economy: creating a cradle-to-cradle business process and economic system that is clean, sustainable, and high-quality.
4. Smart cities: developing the city of the future, which is innovative, sustainable, IT-driven, clean, and inclusive for all residents.

During the PhD Workshop China Dutch Virtual Event you can contact Prof. Dr. Bossink via WeChat (username VUprofs).