Newsletter

Welcome to this December 2018 i3B newsletter. We would like to update you with the latest news: a new Managing Director, new i3B participants, participant news, events, projects and last but not least, a new edition of 'In the spotlight' with Marieke van der Hoeven, i3B Supervisory Board member and Department Head Brain, Behavior and Cognition at Philips Research. Enjoy reading!

HEADLINES

Goodbye Simon Haafs


Simon Haafs.

As many of you might already know, after four years as Managing Director, Simon Haafs has left i3B Foundation. Simon has accepted a new position at the Dutch Enterprise Agency (RVO) per 1 November 2018, to define the new cluster strategy for EUREKA (www.eurekanetwork.org) and to coordinate the ITEA program. We are very grateful for everything Simon has done for i3B. He deserves the credits for the growth of our network (both national and international), the grants of several large subsidies, innovative SME coaching for our participants and last but not least, enhanced collaboration between i3B partners in joint agendas and projects. Simon, thank you for all your efforts. We wish you all the best in the future!

New i3B Managing Director: Henk Gerards


Henk Gerards

We are proud to announce that Henk Gerards (click here for his LinkedIn profile) will start as new i3B Managing Director per January 1st, 2019. Henk is looking forward to meet all i3B participants and others associated with the i3B network soon. Keep an eye out for the first i3B newsletter of 2019, in which we will introduce Henk more extensive!

New i3B Supervisory Board member

We are glad to introduce Marieke van der Hoeven (Philips Research) as the new member of our Supervisory Board. Marieke replaces the recently retired Joop Pauwelussen, who has been member of the i3B Supervisory Board for several years. We would like to thank Joop for his valuable contribution to the Supervisory Board. Interested to read more about Marieke van der Hoeven? Keep an eye out for the *'In the Spotlight'* section at the bottom of this newsletter!

Bas Rodenburg appointed as Professor Animal Welfare at Utrecht University

Recently, the Executive Board of Utrecht University appointed Dr. Bas Rodenburg as Professor in Animal Welfare at the Department of Animals in Science and Society of the Faculty of Veterinary Medicine. His research is aimed at improving the methods for measuring the welfare of animals, focusing on behavioral indicators and methods in which animals themselves indicate how they experience their environment. A second important spearhead is to understand the behavior and welfare of individual animals living in social groups through automated tracking.

Professor Bas Rodenburg

Dr. Sabine Hunnius appointed as Professor Developmental Cognitive Neuroscience at Radboud University

Neuroscience at Radboud University, Nijmegen. Sabine is director of the Baby and Child Research Center and head of the Baby-BRAIN-group at the Donders Institute. Her research is aimed at developmental mechanisms underlying social skills and how development of the brain contributes to social-cognitive development in babies and young children. On Friday, December 7, 2018 her inaugural lecture, entitled: *'Achtung Baby'*, takes place in Nijmegen.

Professor Sabine Hunnius

i3B meets Silicon Valley roadshow

Earlier this year, Chairman of the i3B board Lucas Noldus went on a tour in Silicon Valley (U.S.A.). Amongst others, he visited tech giants Apple, Facebook, Google, Oracle, and Samsung.

During these visits, Lucas Noldus highlighted the i3B network and elaborated on the i3B ecosystem and i3B activities. Besides, Lucas Noldus presented the i3B white paper *'Mea-suring the Cognitive Human'* (click here to download), which has been composed by the i3B SIG Human Factors.

i3B Chairman Lucas Noldus at the Google office in Sunnyvale, California

NEW PARTICIPANTS

i3B is pleased to announce a new participant that recently joined our network:

PhenoSys

www.phenosys.com

PhenoSys was founded in 2006 and is an R&D company based in the centre of Berlin in Germany. We engineer and market innovative technology for animal behaviour research. Our team draws on extensive expertise of electrical and mechanical engineering, computer science, and behavioural biology.

We offer unique instrumentation in the field of behaviour biology. This includes specialised applications of virtual reality systems. Our RFID-based automated solutions enable the scientific community to study animal behaviour of free-roaming rodents in a home cage environment. Our experimental systems are used for behavioural phenotyping, brain research, experimental psychology, and the diagnostic characterisation of animal models for translational medicine.

Running 20/20

www.running2020.com

Innovation network Running 20/20 tracks all relevant developments which can help to advance sports or health. As a innovation eco system, we would like to discover and experience, with individuals, their coaches or caregivers, what the potential added value could be of wearable data coming from sensors in shoes, clothing or even on (or in) the body.

The sports industry is going through exponential innovation, with the rise of smart wearables, bio-sensors and tracking technology. The goal of Running 20/20 is to accelerate innovation of amateur running and elite athletics, by improving technique, performance, sustainability and the *'fun factor'*. Our activities are meant to explore, benchmark and validate pre-trending topics from the world of Science, Business and Sports, from the perspective of Technique, Performance, Health, Life Style, Nutrition, Sleep, Clothing and Gear.

Problem & Solution

The market is being flooded with wearable Sports & Health tech. These apps and devices still provide little benefits, because it's very hard to trust and use the data. It's also because these devices aren't telling you what you need to know. The goal of Running 20/20 is to accelerate and validate innovation, with its valued partners. In this manner, *'Real World'* runners and athletes can actually contribute and participate, to bring sports technology to life.

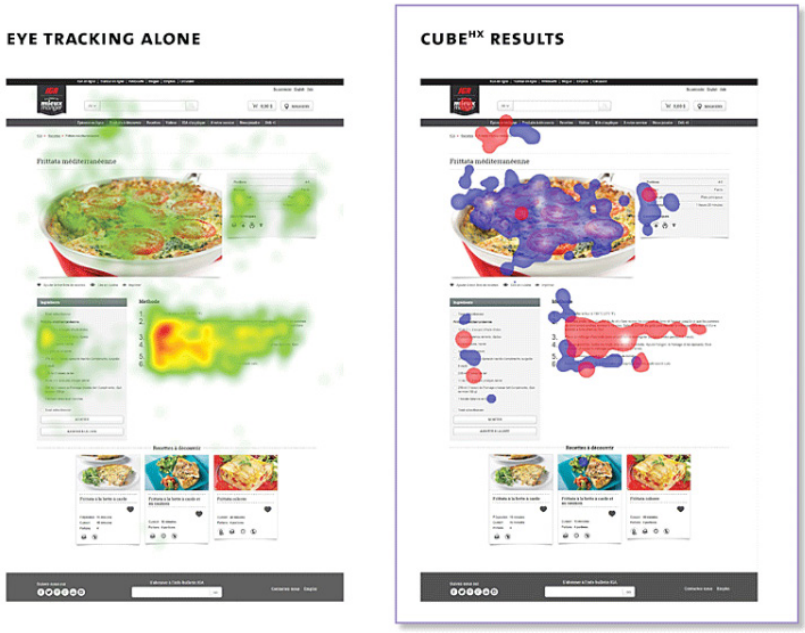
Market

Our ultimate goal is help more and more people to start, sustain and enjoy running, as a way of life or as a way to support healthy living. Our dream is to have 1 billion people running on Planet Earth, before 2050. We're targeting all runners with a drive to innovate and connect runners and running communities across the world.

i3B PARTICIPANTS NEWS

Visualizing User Experience with Cube^{HX}

Noldus Information Technology introduces a revolutionary new tool for User Experience research: Cube^{HX}. This cloud-based software platform combines different types of behavioral data collected in user studies in order to provide fast and rich insights. Going beyond traditional gaze heat maps used in eye tracking, Cube^{HX} captures the complete user experience by combining eye tracking, physiological measurements and emotions (facial expression), and turns these into rich visualizations of what users actually experience while viewing a website. Learn more at www.noldus.com/cube.

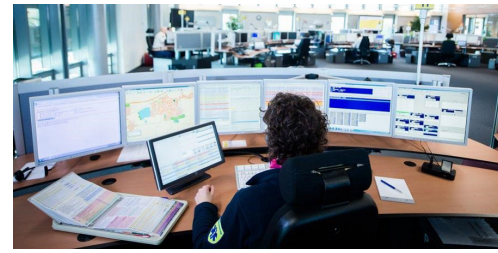


Cube^{HX} by Noldus IT.

Dispatch

In the Netherlands, it is a big challenge to find suitable personnel for Dispatch Centers (receiving emergency calls for ambulances). Protocols keep changing, so in order to maintain a sufficient level of knowledge, the Dispatch Center personnel is trained continuously. In 2012, i3B participant Flavour developed the first Dispatch Center game (Dispatch), aiming to test whether it is possible to train new and current employees in effectively performing the logistic process of emergency calls in a virtual environment.

The first results show that the Dispatch game accelerates the effectiveness of the training process, potentially leading to shorter training duration. In 2017, the Dispatch technology was updated towards a new, more realistic simulation environment. Dispatch Center staff now *'play'* realistic scenarios in their working



Dispatch Control Room (Flavour).

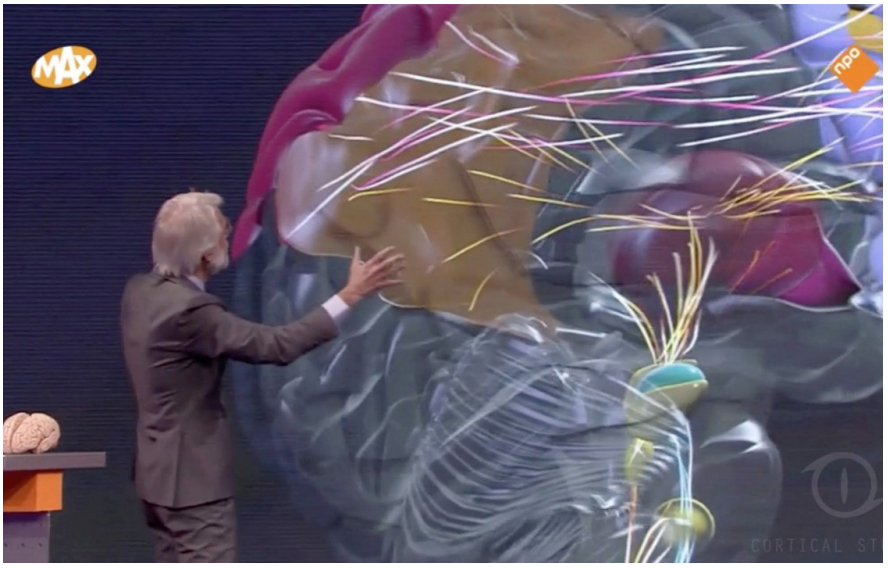
environment, while new personnel can be prepared on their future jobs in a safe environment. In the future, Flavour hopes to connect more Dispatch Centers to the system and to further develop the game. Besides, Flavour aims to make the game multidisciplinary and to offer police and fire department centralists a simulated environment to train in as well.

More information: click here

Cortical Studios visualizes the brain with prof. dr. Erik Scherder

For the television lectures *'Stress'*, *'Language'* and *'Music'* by neuropsychologist prof. dr. Erik Scherder in May, 2018, producer Mr. & Mrs. Lane commissioned Cortical Studios to create the visuals that detail a diversity of brain regions and their interactions. In addition to the anatomical structures, Cortical Studios has visualized the neural pathways, to give more insight into the working of the brain related to these three topics. Click here for the full tv-episode!

Earlier, Cortical Studios developed 3D animations for the lecture concert *'Music and the Brain'* at The Concertgebouw in Amsterdam with prof. dr. Erik Scherder. For the three-part television show *'The Brain'* by prof. dr. Erik Scherder at DWDD University, Cortical Studios developed more than 30 short animations illuminating the complex nature of the human brain. Topics such as facial recognition, communication between brain areas, and the impact of brain disorders are vividly elucidated with great care
and respect. In close collaboration with prof. dr. Erik Scherder, Cortical Studios created a diversity of anatomical visualizations to support his fascinating lectures. Click here for the three-part tv-show!



Brain visualizations by Cortical Studios in a tv-lecture by prof. dr. Erik Scherder

Share your news with the i3B network!

i3B participants can share their important scientific, technical or commercial milestones in our newsletters. Would you like to share an update with the i3B network? Please don't hesitate to contact us!

i3B VALORISATION PROJECTS

The i3B network initiates new projects in the application domains Health, Food, Security and Mobility. The added value for knowledge institutes includes new collaborations with industry and research institutes in different disciplines, additional research budget, new PhD students and access to innovative equipment, resulting in scientific knowledge. Companies benefit by connecting to science and funding for the development of innovative integrated ICT-based solutions that ultimately tackle societal challenges.

During the past year, the i3B network connected science and businesses to exchanges ideas, knowledge and trends. In 2017, the decision has been made to focus on Healthy Lifestyle, Animal Monitoring and Human Factors in small, dedicated Special Interest Groups (SIGs). The SIGs establish a joint agenda and will execute this agenda in joint projects.

PROJECTS OVERVIEW

In 2018, i3B submitted several subsidy applications. In these projects, i3B Foundation is a partner, or at least two i3B members are part of the consortium. In the section below, we highlight recently submitted and approved project proposals.

Big Developments

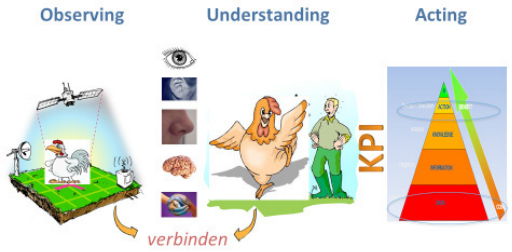
On 28 November, some 60 people gathered in a pop-up tent to celebrate the start of the construction of the Family Pig Barn in Venhorst, in the province of Noord-Brabant. The Family Pig Barn is a revolutionary new type of barn in which pigs will live in groups and will be potty-trained to use specially designed pig toilets. By collecting urine and feces separately, no ammonia will be produced and the bad odor for which pig farms are notorious is prevented. Feed will be dropped in the bedding in between the animals, where the pigs will have to search for it, as wild boars do in nature. Furthermore, the piglets will stay with the sows for an extended period of time, which reduces stress-related behaviors at a later age.

The novel barn concept comes straight from ethology and neuroscience research at Wageningen University. In order to exploit the Family Pig Barn in an economically feasible manner, feed supply and sanitary management will be completely automated. Ultra Wideband tracking will play an essential role: each pig will carry a transmitter with unique ID attached to its ear

tag, which will allow the system to determine when and where pellets must be dropped to give a pig individual and specific food and when the toilet needs to be cleaned. Meanwhile the system can keep track of the activity and behavior of each individual pig. Noldus Information Technology will develop the animal tracking system and the integrated solution together with other companies in the consortium. Professor Bas Kemp (Wageningen University) has high hopes of the new concept, because *"a happy pig is a healthy pig"*.

More info: click here

Approved: x3D



i3B Foundation, Wageningen Livestock Research, Van Hall Larenstein University of Applied Sciences, Saxion University of Applied Sciences and University of Twente joined forces in the EFRO cluster and network reinforcement project "*x3D*". x3D stands for information, communication and sensor technology (ics, pronounced x) monitoring animal behavior, animal health and animal welfare (3D).

The x3D project initiates, promotes and strengthens cooperation between (SME) business, knowledge institutions and end users. This leads to x3D innovations, resulting in a contribution to the economic and social development of the East Netherlands region. Project activities consist of connecting stakeholders through a joint roadmap, organizing inspiration and matchmaking meetings, developing valorisation and collaboration projects, coaching in groups of SME entrepreneurs, and the promotion of the x3D cluster.

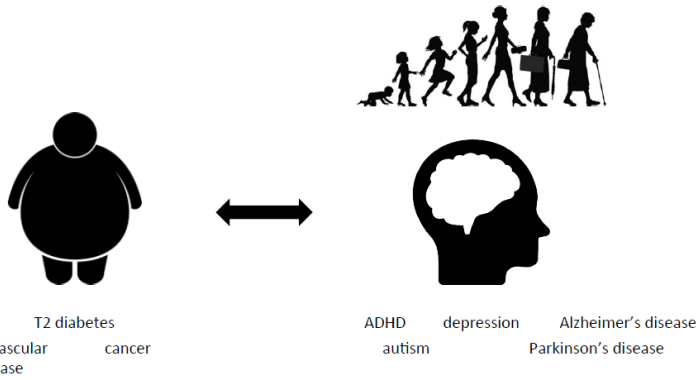
Europese Unie

Approved: Food & Cognition

i3B, Wageningen University, Radboud University, Noldus IT and the Noaber foundation collaborate in the recently approved Food & Cognition EFRO cluster and network reinforcement project.

This project is about understanding the brain processes underlying healthy versus unhealthy food choices as well as how food choices affect brain health and designing technology to give personalized targeted eating advice. The activities consist of building an innovation roadmap with public and private commitments and positioning the roadmap nationally and in Europe.

Europese Unie



Societal challenges on Food & Cognition.

Approved: Citizen Science

Consumers, patients and citizen are increasingly taking their own measurements in the field of nutrition, health and the environment. In the *'Citizen Science'* testing ground, the required mobile and handheld sensors from SME's are validated. The quality of the measurements from the sensors of liquids (water, blood, tear fluid), gasses (breath, air) or food is will thus be reliable and scientifically substantiated. i3B partners Radboud University and Wageningen University & Research are part of the consortium.

Approved: CuRly Pig TAIL (Creating Resilience in Pigs Through Artificial Intelligence)

The PPS-project Curly Pig Tail wants to develop an automated monitoring system that enables pig farmers to spot potential behavioral problems and individual health problems of pigs. Data used in this tool are primarily based on image analyzes of the individual animal and the group, combined with already present data such as feed consumption and water intake. By identifying patterns in data streams, deviations in these patterns can be detected which signals upcoming unwanted behavior such as tail biting or emerging diseases. With the implementation of this tool it will be possible for pig farmers to intervene early so that illness (and therefore antibiotic treatments) and tail biting is prevented. This meets the demand for sustainable and responsible animal husbandry, with low antibiotic use and no interventions on the animal. More information is available at the project website (click here). i3B partners in the project are Wageningen Livestock Research and Noldus IT.

Companies who are interested in joining the PPS-project can contact Maikel Timmerman.

Approved: Future-proof animal transport

The animal transport sector wants to be able to respond to developments that may occur during the transport of animals, in order to do what is best for the comfort and well-being of animals. Ensuring transparency and consumer confidence in the livestock transport sector and a good price-quality ratio. In the transition to sustainable livestock chains, the transport sector (livestock trade, cattle transport, collection centres, importers and exporters) is working on the impact of developments within the society national and international related to the transport of animals, how to respond to this and in particular how well-being of the animals during transport can be structurally improved.

In the *'future-proof animal transport'* project, aimed at pigs, calves and cattle, there is a need for innovation, including a scientific basis, for the application of innovative sensors, materials and systems that can contribute to:

- transporting animals responsibly;
- an objective assessment of animal comfort / well-being during transport;
- ensuring animal comfort / well-being during transport.

i3B partners in the project are: Wageningen Livestock Research and Noldus IT. For more information, send an e-mail to the project's contact person Pieter Hogewerf.

Approved: GrazeGuide

In dairy farming, there is a need for methods offering dairy cow grazing in a labour-extensive, efficient, animal-friendly and socially responsible way. The aim of this PPS-project is to develop a tool meeting these requirements. When using this GrazeGuide system applying grazing will be easier for dairy farmers with a traditional milking parlour, but also for farmers using automatic milking systems.

At the end of this PPS-project the (virtual) GrazeGuide fence can be moved automatically with an app on a tablet, smartphone or PC. Grazing, in the GrazeGuide way, will mean a labour saving for the farmer (outdoor grazing as such already gives labour savings because less roughage harvesting is needed). An additional advantage of using the system is that (large) groups of cows can be managed in production groups during grazing, just like stall-feeding. The effect of the GrazeGuide technology will be that grazing is applied more widely (more *'meadow milk'*) and will be better secured.

i3B partners in the project are: Wageningen Livestock Research, Noldus IT and SODAQ. More information can be found on the project website (click here). Interested to know more about this project? Send an e-mail to GrazeGuide's contact person Pieter Hogewerf.

PAST EVENTS

i3B Special Interest Group Human Factors update

The i3B (participants only) SIG Human Factors came together in May, July and October 2018. The SIG Human Factors composed a white paper, which is a research agenda the SIG partners will execute in joint projects. The next step is to define, design and to carry out these joint projects.

Download the i3B white paper *'Measuring the Cognitive Human'* here.

i3B Special Interest Group Animal Monitoring update

In the previous period, the i3B (participants only) SIG Animal Monitoring focused on the recently approved EFRO x3D subsidy application. At the SIG i3D (Animal Monitoring) meeting in September 2018, the SIG members discussed several project in order to find common ground and to set up joint projects in the future.

5 June 2018 – C.I.A.L.E. event

The foundations i3B, Health Valley and Food Valley NL joined forces in an *'EU funded'* project called C.I.A.L.E.: Connect, Innovate, Accelerate, Learn and Expand. The foundations represent together the largest ecosystem of innovative SME companies in the East Netherlands region. On 5 June 2018, the C.I.A.L.E. partners organized an SME matchmaking event at the Sanadome in Nijmegen. The event started with an entrepreneurship coaching workshop.

From left to right: Victor Haze (Health Valley), Simon Haafs (i3B), Sigrid Helbig (Nijmegen Economic Board) and Jeroen Wouters (Food Valley NL).

Subsequently, an inspiration and matchmaking session took place, with shared experiences from the SMEs who received C.I.A.L.E. coaching, a Keynote lecture by Peter Blangé (KNVB) and a brainstorm towards new Healthy Lifestyle projects. Last but not least, the C.I.A.L.E. project received an award from Sigrid Helbig, Director of Nijmegen Economic Board.

6 - 8 June 2018 – Measuring Behavior 2018

The 11th Measuring Behavior conference took place at Manchester Metropolitan University. Measuring Behavior is the stage for the latest inventions, prototypes, and techniques in behavioral research. It is the premier event for scientists and practitioners involved in behavioral research, and focusses on methods, techniques, and tools in human and animal behavioral research. As well as the usual focus on animal and human behavior research methods, this year we introduced new themes, including robotics (bio-inspired robots and human-robot interactions), sport (biomechanics and human movement), and open science.

The next Measuring Behavior conference will be held in Krakow, Poland, in May 2020.
To stay updated, visit www.measuringbehavior.org and sign up for the newsletter.

27 & 28 August 2018 – C.I.A.L.E. coaching Elitac

The C.I.A.L.E. project contains entrepreneurship coaching based on techniques such as Design Thinking, Lean Startup, Agile, et cetera. i3B participant Elitac was coached for two days on organizational, market-technical and developmental issues. The coaching was guided by innovation professionals from DOON.

6 September 2018 – i3B meets IBM

The event *'i3B meets IBM – from sensors towards prediction'* took place at the Noldus IT office in Wageningen. The event kicked off with an interactive demonstration by Arjen van de Wetering (IBM) and Willem Hendriks (IBM) on IBM techniques around sensor data. Subsequently, Marcel van Gerven (Donders Institute) presented his latest insights on Human-Centered Artificial Intelligence and its applications in science, art and society.

i3B meets IBM, with an interactive demo and machine learning quiz

12 & 13 September 2018 – C.I.A.L.E. coaching Artinis & Orikami

The C.I.A.L.E. project includes entrepreneurship coaching based on techniques such as Design Thinking, Lean Startup and Agile. i3B participants Artinis and Orikami were coached for two days on organizational, market-technical and developmental issues. The coaching was guided by innovation professionals from DOON.

C.I.A.L.E. coaching session with Artinis

20 & 21 September 2018 – H Workload conference

The 2nd International Symposium on Human Mental Workload: Models and Applications (H-WORKLOAD 2018) took place in Amsterdam at the Netherlands Aerospace Centre (NLR). At this event, several i3B participants exhibited with a demonstration stand. Besides, i3B SIG Human Factors member Rolf Zon (NLR) pitched the i3B White paper (click here to download) in order to spread the word about the SIG's activities and to find potential partners.

Rolf Zon's presentation at H-Workload 2018.

24 & 25 September 2018 – C.I.A.L.E. coaching Boomerweb

The C.I.A.L.E. project includes entrepreneurship coaching based on techniques such as Design Thinking, Lean Startup and Agile. Boomerweb was coached for two days on organizational, market-technical and developmental issues. The coaching was guided by innovation professionals from DOON.

27 September 2018 – Wageningen UR Company Day

At the *'Company Day: Future Perspective'* event, organized by Wageningen UR as part of her centennial celebrations, an inspiring view on the latest technologies and possible applications was provided on six themes: Big Data, Blockchain, Climate Smart and Circular Food Production, CRISPR-Cas, Photosynthesis and Precision Agriculture. At the Precision Agriculture track of this event, i3B was present with an exhibition stand regarding the x3D project by the i3B SIG i3D (Animal Monitoring), while our chairman Lucas Noldus participated in a panel session on Artificial Intelligence.

UPCOMING EVENTS

Events and symposia relevant for the ICT for Brain, Body and Behavior network are listed on our website (www.i3b.org/calendar). Please send your event or the event where you will be present with a booth to info@i3b.org. i3B will add these events and conferences to the calendar including a reference to the i3B participant that you can meet at the conference. By doing so, we create a comprehensive overview of relevant conferences and events for the network.

Keep an eye out in 2019 for the following i3B events:

- Special Interest Group 'Human Factors' meetings (Participants only)
- Special Interest Group 'i3D Animal Monitoring' meetings (Participants only)
- x3D Animal Monitoring event
- Food & Cognition event
- Annual Symposium

IN THE SPOTLIGHT

In this newsletter, we direct the spotlight on Marieke van der Hoeven, head of the Brain, Behavior and Cognition department at Philips Research, and the new member of the i3B Supervisory Board.

Who is Marieke van der Hoeven?

Marieke van der Hoeven studied Bio- and Neuropsychology at Utrecht University. Marieke liked the experimental research very much. After graduation, she decided she wanted to do applied research instead of fundamental research. Therefore, Marieke started her professional career as researcher in the Perception-Visual group of TNO Soesterberg in 2004. Her research group, mostly physicists, worked on challenges from the Defence field. Four years later, Marieke became department

manager Weapon Systems at TNO Rijswijk and subsequently business unit manager Information & Operation at TNO in The Hague.

In 2011, Marieke joined Philips Research to head the department Brain, Body and Behavior. She has been working for Philips Research ever since. For the past two years, Marieke has been working as department head Brain, Behavior and Cognition, leading a team of 38 researchers. The team's focus lies on three topics (see below) and holds the idea that innovation should be looked at from both bottom-up (data-driven) and top-down (theoretical) insights. The Brain, Behavior and Cognition department of Philips Research consists of three pillars:

- *Brain:* In the field of Brain, Marieke's department works on subjects related to fMRi, EEG, tDCs and other technologies in the domain of Mental and Neurological health.
- *Behavioural change/engagement:* In this field, the department's focus lies on technology driven healthy behaviour and engagement (both consumer as patient engagement): how to encourage people towards healthy behaviour such as physical exercise, how to encourage app usage, how health professionals use technological systems, enhance medication adherence, etc.
- *Cognition:* In the domain of Cognition, Marieke's department works on memory training strategies and on digitizing neuropsychological tests.

Added value of i3B collaboration

Marieke van der Hoeven joined our i3B Supervisory Board because she believes connecting people from both the industrial and scientific field can generate strong advantages for all parties involved. For Philips, it is valuable to know about current industrial and scientific challenges and to collaborate with organisations who are working on similar topics. Marieke believes in bringing people together, which is key in the i3B network.

Golden tip

The golden tip Marieke van der Hoeven would like to share is: *Innovation lies in the combination/intersection of different competencies*. So in order to create those innovations we need to use each other's competencies and really try to come to a mutual understanding between the different disciplines, really learn to speak each other's language. We need to value each other and understand the differences between people in order to overcome them.

Please send us a recommendation of someone you would like to see in the spotlight of our next newsletter.

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