

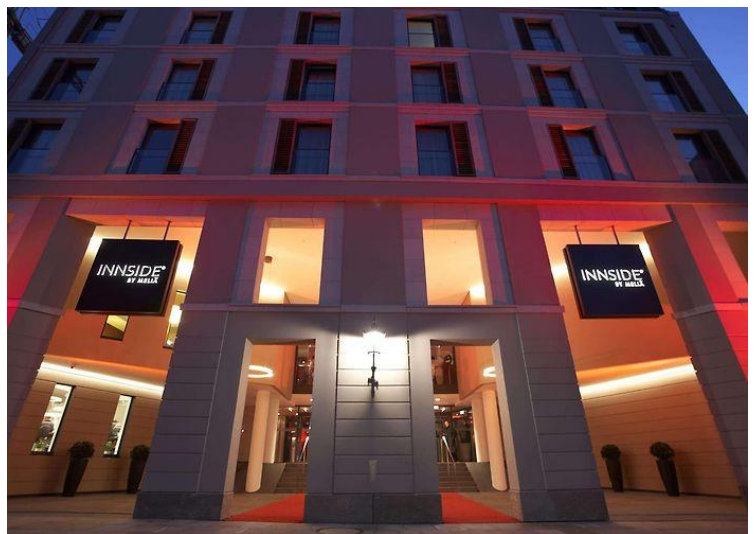
CRC Spring School 2023

Synergies and Applications of Volition and Cognitive Control

20th to 24th of March

Since the CRC is drawing to an end, we would like to take the opportunity and use this Spring School to take a step back and look at the big picture. How do the findings and ideas of different CRC projects relate to one another? Do the results and concepts hold up in everyday life? Are we actually able to answer the questions we set in the beginning of the CRC?

For **PhD students**, the Spring School will be a chance to connect beyond their CRC project, not just within the CRC but with the international speakers, and get ideas and inspiration for discussing their findings in their dissertations.



For **PIs and PostDocs**, the Spring School is an opportunity to get inspired and find ways to continue the promising research threads that emerged from their projects after the end of the CRC.

The **three workshops** will take place from Monday to Wednesday. You can attend as many workshops as you like.

Presentations, Synergy Networking, Career Lessons, and Faculty Feud will take place at the Innside Melia on Thursday and Friday.

CRC Spring School 2023

Program

Time	Monday	Tuesday	Wednesday	Thursday	Friday
09:00	Workshop I: Neuroanatomy	Workshop II: PsychoPy	Workshop III: Research Data Management		
09:30					
10:00				Birte Forstmann	Eliana Vassena
10:30					
11:00				Coffee Break	Coffee Break
11:30					
12:00				Agnes Moors	Soyoung Park
12:30					
13:00				Lunch Break	Lunch Break
13:30					
14:00					
14:30				Synergy Networking	Simone Weller
15:00					
15:30				Coffee Break	Coffee Break
16:00					
16:30		Faculty Feud & Goodbye			
17:00			Career Lessons		
17:30					
18:00			Social Evening		

CRC Spring School 2023

Program

Workshops:

Monday, 20.03.

Neuroanatomy Lab Course

Instructor: Prof Josef Jászai

Location: Mikroskopiersaal, MTZ, University Hospital Dresden

Tuesday, 21.03.

Conducting Experiments with PsychoPy

Instructor: Rebecca Hirst (PsychoPy Co-Founder)

Location:

<https://tu-dresden.zoom.us/j/67926350025?pwd=VEw1ejdsMC96RnJsMHkyazFjNnpHdz09>

Wednesday, 22.03.

Research Data Management

Instructor: Dr Denise Dörfel

Location: BZW A307, Main Campus

Each workshop starts at 9 am and will end between 4 and 5 pm.

Special Sessions on Thursday & Friday:

Career Lessons

PIs of the CRC share their advice and experiences in a panel format

Synergy Networking

Participants find commonalities between the cognitive control concepts of the CRC projects and inspiration through an exchange of ideas with other participants in a World Café style discussion

Faculty Feud

A game format in which two teams of PIs face off against each other and try to give the same answers that the PhD students have provided before

CRC Spring School 2023

Workshops



Workshop 1, Monday:

Neuroanatomy Lab Course

Prof József Jászai (University Hospital Dresden)

Understanding macroscopic structure of the central nervous system (CNS) is the basis for learning pathways, functional circuits subserving higher cognitive function. Therefore, the study of external and internal morphology of the CNS in a wet lab (i.e. dissection-room) significantly facilitates learning of functional systems (in lecture courses or in computer labs) that makes up the most significant portion of many neuroanatomical courses. Without previous visual experience, it is an extremely difficult task to overcome.

The neuroanatomy course provides a broad overview of the structure of the CNS dealing with representative levels of the neuraxis, with a principal focus on issues relevant to further understanding of functional aspects the nervous system. The main objectives of the course are to (1) provide the students with a basic working knowledge and nomenclature of the central nervous system and (2) to present basic functional neuroanatomy required to understand the functional systems. These objectives are achieved by use of fixed specimens of whole brains in a step-by-step dissection procedure and brain sections to provide a general overview of the 3-D structure of the brain. This latter aspect will be further strengthened by an additional virtual dissection of the brain by means of Anatomage Table.

Workshop 2, Tuesday:



PsychoPy

Dr Rebecca Hirst, PsychoPy Co-Founder, and
Kimberley Dundas (Nottingham, England)

PsychoPy is a free, open source, software for running behavioural studies that now supports online experiments through integration with Pavlovia.org. In this workshop we will demonstrate the basics of creating an experiment in PsychoPy, put it online with Pavlovia.org and demo how to make surveys using Pavlovia Surveys. As we get into the session we hope to give attendees hands on experience of making an experiment, as you will make an experiment with us. We will also introduce basic Python concepts that can be used to extend your experiment in flexible ways. Finally, we will walk through how you can integrate your experiment with a variety of external hardware, eye trackers, EEG and fMRI.

Image via lukas-snoek.com

Time	Topic
9:00 – 10:00	PsychoPy Pavlovia Demo
10:00 – 10:15	BREAK
10:15 – 12:00	Making a basic experiment in PsychoPy
12:00 – 13:00	LUNCH
13:00 – 14:00	Extending Builder view with Python code
14:00 – 14:15	BREAK
14:15 – 15:00	Making dynamic experiments
15:00 – 16:00	Integrating external hardware
Q & A	

Workshop 3, Wednesday:

Research Data Management

Dr Denise Dörfel (Service Center Research Data, TUD)

The workshop will show you hands-on how to implement research data management (RDM) practices and how it can be supported by tools and services of the TU Dresden. By doing so we will create a data management plan (DMP) for your project, an effective way to ensure structured handling of data and tracking of the research results. Topics include storage and structuring data, the description of data with metadata, personal and collaborative data management, archiving and the publication of research data.



So, bring your own data and work directly on your files and folders to take the first (or second or third) steps in your data management. Your individual RDM solutions will be recorded in the DMP, giving you a reference that you can access at any time when it comes to the reproducibility of your research. Participants will have to bring along their laptops.

CRC Spring School 2023

Program

Speakers:

Motives and modulators of human decision making

Prof Soyoung Park (Potsdam, Germany)

What drives us to trust someone we just met? Did we eat spaghetti for lunch because we saw our colleague eat spaghetti? How is our breakfast linked to our social interactions throughout the day? Research from different disciplines such as economics, psychology and neuroscience have attempted to investigate the motives and modulators of human decision making.



Our decisions can be flexibly modulated by the different experiences we have in our daily lives. These modulations can occur through our social networks, through the impact of our own behavior on the social environment, but also simply by the food we have eaten. Here, I will present a series of recent studies from my lab in which we shed light on the psychological, neural and metabolic motives and modulators of human decision making.

Image by David Aussenhofer

Towards a goal-directed model of maladaptive behavior in daily life and psychopathology

Prof Agnes Moors (Leuven, Belgium)



People often engage in behavior that is not in their best interest—so-called maladaptive behavior—both in daily life (e.g., action slips, costly or recalcitrant emotional behavior, weak-willed behavior) and psychopathology (e.g., addiction, impulsive and compulsive behavior).

To explain this maladaptive behavior, theorists have turned to dual-process models with a default-interventionist architecture, in which the default determinant of behavior is a stimulus-driven (or habitual) process, which can occasionally be overruled by a goal-directed process provided that there is sufficient opportunity, capacity, and motivation. In these models, maladaptive behavior is caused by a stimulus-driven process that is insufficiently corrected by a goal-directed process (i.e., a lack of executive control).

In recent years, I proposed an alternative dual-process model with a parallel-competitive architecture in which stimulus-driven and goal-directed processes operate in parallel but the goal-directed process often wins the competition and therefore counts as the main determinant of behavior, including maladaptive behavior. In this model, maladaptive behavior is caused by a goal-directed process at the service of a hidden goal or by errors in the goal-directed process. I illustrate how the alternative model can shed light on action slips, emotional behavior, and compulsive behavior (e.g., in addiction and/or OCD).

Image by Agnes Moors via ppw.kuleuven.be

Enhancing cognitive control through training and transcranial direct current stimulation

Simone Weller (Tübingen, Germany)

Cognitive control (CC) is an important prerequisite for goal directed behaviour and efficient information processing. Dysfunctional CC is often associated with psychiatric disorders such as depression, but can be improved through means of specific CC trainings and non-invasive brain stimulation.

I will present several current studies from our research group that investigate the effects of a taxing cognitive control training on healthy and depressed subjects and how it can additionally be modulated by transcranial direct current stimulation.

Image via medizin.uni-tuebingen.de



Modeling motivated control: from effort-based decision-making to computational psychiatry

Dr Eliana Vassena (Radboud, Netherlands)



Computational approaches to motivated behavior aim at describing the neural mechanisms underlying motivation, control allocation, and decision-making. These key processes are influenced by environmental factors (controllability, difficulty, available reward) and are impaired in several psychiatric disorders. I will discuss a biologically-plausible computational model that frames motivated control as a meta-learning problem, describing the role of prefrontal cortex and monoaminergic modulations.

Further, I will show how this framework can guide explanations of motivational impairments under stress and in stress-related disorders as a possible tool for phenotyping.

Image via ru.nl

Towards a mechanistic understanding of the human subcortex

Prof Birte U. Forstmann (Amsterdam, Netherlands)

Today only seven percent of the subcortical structures listed by the Federative Community on Anatomical Terminology (FCAT, 1998) are depicted in available standard MRI-atlases (Forstmann et al., 2017). As a consequence, the remaining 423 subcortical structures cannot be studied using automated analysis protocols available for MRI and therefore require trained anatomists for the study of subcortical brain areas: The human subcortex is notoriously difficult to visualize and analyze with functional magnetic resonance imaging.



In this talk, exciting technical advances are presented that allow charting terra incognita; the human subcortex. Closing the knowledge-gap of the human subcortex has already resulted in the re-evaluation of prominent models in the cognitive neurosciences such as the functional role of cortico-basal ganglia loops in decision-making. I will discuss the emerging possibilities of novel human neuroanatomical approaches and directions for the incorporation of these data within the field of model-based cognitive neuroscience.

Image via birteforstmann.com