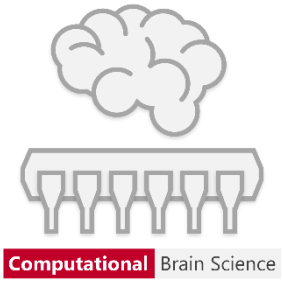
JGU Internal Workshop on
Computational Brain Science



Objectives

Understanding **how the human brain works** is one of the great scientific challenges of the 21st century. At the JGU, **a large community of scientists** are working on brain-related research. This includes questions of understanding the biological mechanisms, brain-associated medical conditions, the structure of biological neural networks, computer simulations of the latter, predictive models of psychological phenomena and mechanisms, artificial intelligence, and many more related topics.

Understanding the brain and cognitive processes is a **highly interdisciplinary** research area, involving many different disciplines of empirical sciences (physics, biology, bio-chemistry, medicine, psychology, …) and various mathematical and computational tools. In particular, a strong link between neuroscience and computational science is essential for many of the open research questions.

To join forces, the JGU research centers CSM (Center for Computational Sciences Mainz) and FTN (Focus Program Translational Neurosciences), and DRZ (German Resilience Center) are starting a new research initiative that **brings together researchers** from these different areas, and in particular strengthens the use of **computational tools** (such as: machine learning, multi-scale simulations, pattern recognition, big data methods, and high-performance computing) and models (such as: network analysis, statistical physics, molecular dynamics).

The goal is to create a new forum for collaborations among the various researchers working in the general area of neuroscience. Furthermore, we aim to get new people on board, who could provide novel computational tools and approaches for the *in silico* aspects within our planned initiative, *in vivo* models (such as mouse or drosophila brain data) for benchmarking, validating and challenging the computational tools, as well as colleagues being interested in contributing with ambitious and prominent new ideas for further research questions and funding-initiatives.

Workshop

As a **start-off** the two research centers are organizing a **work shop** to **build up collaborations** and **define tandem projects** matching biology with computational / mathematical sciences**.**

The workshop will be held

On: **February 09 2018**
From: **9:00h** to **16:00h** (tentative)
Location: **Senatssaal A3.01, Hochschule Mainz,**
Lucy-Hillebrand-Str. 2, Mainz

Call for Contributions

We invite researchers from the JGU working on topics related to computational neuroscience / brain science to give a short overview presentation at the workshop. Researchers developing computational or mathematical tools with potential future applications in neuroscience are equally welcome. Typical presentations should be 10-15min long and typically address the following topics:

- Generally: What are important open problems / ongoing research efforts in your area of research?
- Neuroscientists: What are your computational problems? Which tools and efforts would be necessary / useful to drive your research forward?
- Computational scientists: Which models or methods could be useful for brain related research (such as: mathematical, physical, or algorithmic models, data analysis and big data, high-performance computing, novel algorithms)?
- Experimentalists: What kind of data do you have (or would you be able to generate) and what would you like to investigate in a collaboration with a computational scientist on this topic.

The event will be kept fairly informal and focused on discussing research ideas and potential collaborations. There is no need to provide highly polished presentations – the key goal is to bring together people with matching research tools & interests. Although the event is internal (not a public workshop but an internal discussion), external collaborators from the broader region are welcome to join, if you feel that this would be beneficial.

If you are interested in joining the workshop, please provide:

- Your name / affiliation / area of research
- A title and a very short abstract (just a few sentences)

by end of December 2017 via mail to csm-office@lists.uni-mainz.de (please use the subject "workshop computational brain science"). In case you want to attend the workshop but not give a talk, please let us know using the same email address (same deadline). The final schedule will be announced in mid January 2018. We are looking forward to your participation!

tl;dr: send a short proposal for a 10-15min talk, **deadline: Dec. 31 2017**

Organizers

This is a joint initiative of the Focus Program Translational Neurosciences (FTN), the Center for Computational Science Mainz (CSM) and the German Resilience Center (DRZ), and the Vice President for Research of the JGU.

Workshop Organizers

Susanne Gerber (CSM), Susann Schweiger-Seemann (FTN), Michael Wand (CSM)
(contact: Michael.Wand@uni-mainz.de)

Initiative "Computational Brain Science" – Initial Committee

Carsten Duch, Susanne Gerber, Raffael Kalisch, Stefan Kramer, Friederike Schmid, Susann Schweiger-Seemann, Stefan Mueller-Stach, Michael Wand, Frauke Zipp