Join Radboud Summer School 2018!
Linear Algebra for Neuroscientists

change perspective

Radboud University
Analyzing Neural Time Series Data

Do you have large-scale neuroscience datasets and lots of ideas, but need a better understanding of how to work with your data? Then this course is for you! In one intense week you will learn several key mathematical concepts in multichannel neuroscience analyses with a focus on dimensionality reduction, source separation, and synchronization, and how to implement them in Matlab.

Neuroscience is moving towards “big data,” with new and improved brain measurement technologies that acquire an ever-increasing amount of data. Examples include multichannel LFP/tetrodes, high-density MEEG, and optical imaging. Increases in the number of simultaneously recorded data allows new discoveries about spatiotemporal structure in the brain, but also presents new challenges for data analyses. Because data are stored in matrices, algorithms developed in matrix analysis will be extremely useful. On the other hand, linear algebra and matrix analysis are unfortunately rarely taught in neuroscience/biology/psychology courses.

The course is mathematically rigorous but is approachable to researchers with no formal mathematics background. MATLAB is the primary numerical processing engine but the material is easily portable to Python or any other language. The focus is on understanding methods and their implementation, rather than on using analysis toolboxes.

After this course you are able to
- Understand the key concepts in linear algebra including matrix multiplication, inverse, and projections, as well as know geometric and algebraic ways of representing data and analyses.
- Implement the least-squares algorithm to estimate general linear model parameters.
- Understand eigendecomposition and its use in dimensionality reduction and source separation.
- Simulate multivariate data to evaluate analysis methods and model overfitting.

Number of EC
2 ECTS credits

Course leader
Michael Cohen, Assistant professor, Cognitive Neuro Science, Radboud UMC
Entry level
Master, PhD, Postdoc, Professional

Admission documents
• Motivation letter
• CV

For whom is this course designed
This course is designed for PhD students, postdocs, and senior researchers who are interested in learning about cutting-edge multivariate data analysis methods that are suitable for hypothesis testing and exploration in multichannel recordings (“big data”). Some experience with Matlab is necessary. Master’s students are welcome if they have had some experience with neuroscience data analysis.

Dates
Monday 13 August – Friday 17 August 2018

Course fee
€ 585

Discounts
• 10% discount for early bird applicants. The early bird deadline is 1 April 2018.
• 15% discount for students and PhD candidates from partner universities.
Want to be part of the RSS experience?

More than just a course!
Radboud Summer School is more than an academic event. It is a unique opportunity to meet other international students and researchers, to get to know Radboud University and the city of Nijmegen. Our participants come from all over the world and have different cultural and academic backgrounds. Our programme includes the following activities free of charge: welcome reception, guest lecture and farewell drink. We also offer sports activities, a BBQ, a river cruise on a Pancake Boat and a city tour for a small fee.

Have a look at what participants have said about their experience!

You can find more details about the courses on our website

Deadline application
1 June 2018

Register now!

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www.ru.nl/radboudsummerschool, 5-17 August 2018