



# Radboud Summer School

Extra Edition!

**Analyzing Neural Time Series Data**

**25-29 June 2018**

Radboud University

Nijmegen, The Netherlands





## Extra Summer Course Analyzing Neural Time Series Data 2018

Due to the overwhelming success of the previous summer courses held by Dr. Michael Cohen we offer you the opportunity to join this extra summer course. Please read the information below carefully as the conditions for this particular course differ slightly from our other summer course.

***Do not forget to sign up as soon as possible as this course will be sold out very quickly.***

<b>Course Leader</b>	Dr. Michael Cohen Assistant professor Cognitive Neuroscience Radboudumc
<b>Course date</b>	25-29 June 2018
<b>Course fee</b>	€ 625 € 535 master and PhD students from <a href="#">partner universities</a>
<b>Included in fee</b>	<ul style="list-style-type: none"><li>• Registration fee, course materials, coffee/tea and lunch</li><li>• Social events:<ul style="list-style-type: none"><li>○ City tour Nijmegen + pancake dinner (Monday 25 June)</li><li>○ Movie night or Pub Quiz (Wednesday 27 June)</li><li>○ Farewell Drinks (Friday 29 June)</li></ul></li></ul>
<b>Extra bonus</b>	Free Radboud Bikes! As an extra bonus we will offer you free use of a Radboud rental bike for the whole week! We will hand out the bikes on Monday after the first day of lecture.
<b>How to apply</b>	Please send your CV and motivation letter to <a href="mailto:radboudsummerschool@ru.nl">radboudsummerschool@ru.nl</a> The motivation letter should include “By the end of this course, I want to be able to...” and state your previous experience with neuroscience data and programming languages (Matlab/Python/Other).
<b>Application Deadline</b>	1 June 2018



## Content of the course

Do you want to learn more about neuroscience data analysis but are missing a formal background in mathematics or programming? Then this course is for you! In one intensive week you will learn some of the most important mathematical concepts in neurosciences analyses, and how to implement them in Matlab.

Rhythmic activity such as oscillations and synchronization are widespread in neural time series data, and are thought to have important roles in brain function, including providing temporal structure to shape information-processing, dynamically routing information processing, and synchronizing dynamics over multiple spatial, and temporal scales. Detailed theories are important for understanding the role of rhythmic activity in the brain, but appropriate data analyses are absolutely essential. Unfortunately, there is often a gap between scientists' ideas about how to analyze their data, and their knowledge of the mathematical and practical steps to analyze the data in order to test those ideas.

The purpose of this course is to provide a firm grounding for understanding advances neural time series (LFP/EEG/MEG) analyses, with a strong focus on time-frequency and synchronization analyses. The course is mathematically rigorous but is approachable to researchers with no formal background in mathematics. If you want to analyze your neuroscience data completely on your own, this course will certainly help you get started. It will also provide a firm basis for using analysis toolboxes such as eeglab or fieldtrip, although the course does not provide instructions for how to use these toolboxes.

Each day will be a mix of lectures and hands-on lab work. During the lab work you will have the opportunity to implement the concepts discussed in the lecture in Matlab. Lab work is done individually or in small groups of 2-3 students. There will be homework assignments to help you consolidate and develop your newly learned skills (homework is not graded, and solutions will be provided the following day).

This will be an intensive course designed for learning, but there will be plenty of coffee and chocolates to keep you motivated. This material has been taught by Dr. Cohen for nearly a decade in several different countries, and is the basis of the book *Analyzing Neural Time Series Data* (MIT Press, 2014). You have to bring a laptop with Matlab or Octave (a free Matlab-like software) installed. Desktop computers will **not** be available.



### **Learning Outcomes**

After this course you are able to:

1. Understand the mechanics of the Fourier transform and how to implement it in Matlab.
2. Use the complex wavelet convolution to extract time-frequency information from time series data.
3. Simulate data to test the accuracy of data analysis methods and effects of parameters.
4. Implement non-parametric statistics to evaluate statistical significance while correcting for multiple comparisons.

### **Level of participant**

- Master
- PhD
- Post-doc
- Professional

### **For whom is the course designed**

This course is designed for PhD students, postdocs and senior researchers who have experience with data analysis and want a deeper understanding of advanced data analysis methods. Some experience with Matlab is necessary. Please note that a strong background in mathematics is **not** required. Master students are welcomed if they have had some experience with neuroscience data analysis. The course focuses heavily on analog signals (LFP/EEG/MEG).

### **Admission Requirements**

- Previous experience (beginner to moderate level) with Matlab.
- A positive and optimistic attitude!

### **Language requirements**

We expect you to have a good command of the English language (IELTS 6.0, B2, TOEFL 550 or equivalent) so you can follow the lectures, write papers and participate actively in the discussions.

### **Admission Documents**

- Motivation letter: should include “By the end of this course, I want to be able to...” and state your previous experience with neuroscience data and programming languages (Matlab/Python/Other).
- CV



### **Number of ECTS credits**

2 ECTS credits

Student workload at Dutch universities is expressed in ECTS credits. ECTS stands for European Credit Transfer and Accumulation System, a system widely used throughout the European Union. In the Netherlands, each ECTS credit represents 28 hours of work. We would like to point out that recognition of credits is at the discretion of your home institution.

### **Certificate of Attendance**

You will be awarded a certificate of attendance for actively participating and successfully completing all assignments of the course. The number of credits will be listed on the certificate of attendance.

### **Cancellation policy**

Regardless of your reasons for cancellation (e.g. visa refusal), the following cancellation policy applies after registering for a course:

- Cancellation before 1 May 2018: 90% refund
- Cancellation between 1 May - 1 June 2018: 50% refund
- Cancellation on or after 1 June 2018: no refund

### **Cancellation by Radboud Summer School**

If Radboud Summer School cancels the course, you will receive a 100% refund for the amount paid. Radboud Summer School is not liable for refunding other costs. Please wait with making travel arrangements until you receive final confirmation about the course.

### **Welcome and registration**

We will welcome you on the first day at our university. On Monday morning you will receive an information booklet, your name badge, lunch vouchers and a goodie bag.

***Please note that this registration is different from our registration in August 2018.***



## Testimonials of our participants of 2017

*"Great course, great lecturer"*

*"Very good course. Lecturer with outstanding didactic qualities. The matlab code exercises were very clear and well set-up".*

*"I think the course was excellent, well-taught and contained exactly the information I needed. Also, this is the first I took in which coding exercises did not end up in complete chaos. Well done. I really enjoyed the week."*

*"Outstanding teacher and very interesting and rich programme"*

*"I am impressed by the level of organisation. Very relaxed, but still well-structured. Well done!"*

*"The most positive aspect of Radboud Summer School was that the lecturer who does not only hold impressive subject knowledge, but beyond that was able to teach in an extremely useful way"*

*"The course had a very high level and provided me new insights on how to analyse my own data. That is, it was very beneficial to my career. The staff was also extremely nice and helpful."*





## Accommodation

Below you will find some suggestions where to stay. Please note that you need to book these accommodations yourself. Many of the hotels and B&B's are located in or near to the city centre, which is also close to Central Station. There are excellent bus connections from the city centre to the university. Travelling from the city centre to university only takes ten minutes by bus and is on just fifteen minutes biking distance. Most of the accommodations can be easily booked through [www.bookings.com](http://www.bookings.com)

### ***Mercure Hotel Nijmegen***\*\*\*\*

Address: Stationsplein 29, 6512 AB Nijmegen

Phone: +31 24 20 19000

E-mail: [H1356@accor.com](mailto:H1356@accor.com)

Website: [www.accorhotels.com/Nijmegen](http://www.accorhotels.com/Nijmegen)

### ***Amrâth Hotel Belvoir***\*\*\*\*

Address: Graadt van Roggenstraat 101, 6522 AX Nijmegen

Phone: +31 24 323 2344

E-mail: [info@belvoir.nl](mailto:info@belvoir.nl)

Website (English): <http://www.amrathhotels.nl/belvoir/welcome-en.html>

### ***Apollo Hotel***\*\*\*

Address: Bisschop Hamerstraat 14, 6511 NB Nijmegen

Phone: +31 24 322 3594

E-mail: [apollohotel@planet.nl](mailto:apollohotel@planet.nl)

Website (English): [www.apollo-hotel-nijmegen.nl/links/index.html](http://www.apollo-hotel-nijmegen.nl/links/index.html)

### ***Hotel Atlanta***\*\*\*

Address: Grote Markt 38, 6511 KB Nijmegen

Phone: +31 24 360 3000

E-mail: [info@atlanta-hotel.nl](mailto:info@atlanta-hotel.nl)

Website (Dutch): [www.atlanta-hotel.nl/](http://www.atlanta-hotel.nl/)

### ***Hotel Courage***\*\*\*

Address: Waalkade 108 – 112, 6511 XR Nijmegen

Phone: +31 24 360 4970

E-mail: [info@hotelcourage.nl](mailto:info@hotelcourage.nl)

Website (Dutch): [www.hotelcourage.nl](http://www.hotelcourage.nl)





**Hotel Credible \*\***

Address: Hertogstraat 1, 6511 RV Nijmegen

Phone: + 31 24 322 0498

E-mail: [info@in-credible.nl](mailto:info@in-credible.nl)

Website (English): [www.in-credible.nl](http://www.in-credible.nl)

**Guesthouse Vertoef**

Nassausingel 3, 6511 EV Nijmegen

Phone: +31 88 004 24 24

E-mail: [info@guesthousevertoef.com](mailto:info@guesthousevertoef.com)

Website (English): [www.guesthousevertoef.com](http://www.guesthousevertoef.com)

**B&B Hotel 'De Vlinder' (Butterfly)**

Address: Staringstraat 9a, 6511 PC Nijmegen

Phone: +31 24 8459090 (08:00-16:00)

E-mail: [post@bbhoteldevlinder.nl](mailto:post@bbhoteldevlinder.nl)

Website (English): [www.bbhoteldevlinder.nl/en/](http://www.bbhoteldevlinder.nl/en/)

**B&B De Prince**

Address: Lange Hezelstraat 42-44, 6511 CK Nijmegen

Phone: +31 24 3604510

E-mail: [info@deprince.nl](mailto:info@deprince.nl)

Website (English): [www.deprince.nl/](http://www.deprince.nl/)

**Boat Opoe Sientje**

Address: Lindenberghaven 1c, 6511 XP Nijmegen

Phone: +316 41 82 79 59

E-mail: [boekingen@opoesientje.nl](mailto:boekingen@opoesientje.nl)

Website: [www.opoesientje.nl/en/](http://www.opoesientje.nl/en/)

**How to get to Radbound University**

The city of Nijmegen is easily accessible by car, train or bus from all parts of the country. For nationwide travel, trains are the best option. There are several airports in the neighbourhood, so when planning your trip to Nijmegen, please check which airport is the most convenient for you.

Trains stop at Nijmegen Central Station and Station Nijmegen Heyendaal. During rush hour bus line 10, the Heyendaal Shuttle, runs every five minutes directly from the central station to campus Heyendaal. This bus line runs only during weekdays and not during holidays and in weekends.



Local buses stop on campus in the Philips van Leydenlaan, the Heyendaalseweg, the Kapittelweg and Erasmuslaan. There are several connections from Nijmegen Central Station to these bus stops both on weekdays and in weekends.

For traveling by bus or train you must use the OV-chipkaart (public transportation chip card).

An easy way to plan your trip is using the website [OV9292](https://www.ov9292.nl).

The '**OV-chipkaart**' is used as a general means of payment for the public transport system. The OV-chipcard can be loaded with credit in euros with which you can travel within the Netherlands by bus and train.

## City of Nijmegen

Nijmegen is one of the oldest cities of the Netherlands and dates back to Roman times. Today, the city is well-known for its vibrant student life and great options to enjoy your spare time. Above all participants mostly appreciate the green surroundings as well as the many opportunities that the city offers for relaxation and entertainment.



Whether the reason for your stay in Nijmegen is to study, to work or to perform research at the university, there is a lot more to the city of Nijmegen than just the university. In your free time, there are plenty of different things you can do to enjoy yourself. Whether you prefer shopping, going to a museum, a music festival or a movie, it is all possible. There are even beaches along the river Waal where you can chill during a warm summer day.





### Summer Capital of Holland

Nijmegen is one of the largest student cities in the Netherlands and has the highest terrace-density of the Netherlands. During summer all sorts of cultural & culinary activities are being organized.



Why not see a concert, go to museum, chill out in one of the parks or head out to the beach on the city island. Visit one of the local restaurants to enjoy delicious food or have a chat and drinks with locals in one of the many pubs. Nice to know that most of the people speak English. To find out more about all the events during summer [visit this website](#).

### European Green Capital

We are very proud that Nijmegen is the first Dutch city that has been awarded the title of European Green Capital 2018. The European Green Capital Award is an initiative of the European Commission. The title is awarded every year to a European city that leads the way in sustainability, thus serving as a source of inspiration for other cities. The winner then carries the title of European Green Capital for one year.

> [More about Green Capital 2018](#)

### Apply Now!

***Sign up now as this course will be sold out very quickly.***

You can apply by sending your CV and motivation letter to [radboudsummerschool@ru.nl](mailto:radboudsummerschool@ru.nl)

We look forward to welcoming you this June.

