Florian Krause

**Work**
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# Curriculum Vitae

## Personal Details

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|---|---|
| Date, Place of Birth | 25. 5. 1983, Gießen, Germany |
| Nationality | German |

## Research Interests

Neurofeedback
(real-time) functional Magnetic Resonance Imaging
Individual Differences
Embodied Cognition
Numerical/Mathematical Cognition

## Education

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|---|---|
| Oct 2009 – Oct 2014 | Ph.D. at Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, The Netherlands (Title of thesis: *"Numbers and magnitude in the brain: A sensorimotor grounding of numerical cognition"*) |
| Sep 2007 – Aug 2009 | M.Sc. in Cognitive Neuroscience (cum laude) at Radboud University Nijmegen, The Netherlands (Title of thesis: *"Action categories in the human premotor cortex"*) |
| Sep 2003 – Aug 2007 | B.Sc. in Cognitive Science (Excellent - ECTS grade A) at University of Osnabrück, Germany (Title of thesis: *"Differences in the resolution of German personal and demonstrative pronouns and the influence of world knowledge on this process – an eye-tracking study"*) |
| Sep 2005 – Feb 2006 | Semester abroad at University of Trento, Italy |
| Aug 1999 – Jun 2002 | Grammar school "Laubach Kolleg" (Abitur), Laubach, Germany |

## Professional Experience

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|---|---|
| May 2014 – today | Postdoctoral research in the EC-funded “BRAINTRAIN“ project (Grant (Agreement number 602186) with Prof. Dr. Rainer Goebel at Brain Innovation B.V., Maastricht, The Netherlands<br>(real-time functional Magnetic Resonance Imaging, Electroencephalography, Neurofeedback) |
| May 2014 – today | Software testing and user support for neuroimaging analysis software at Brain Innovation B.V., Maastricht, The Netherlands |
| May 2014 – today | Honorary appointment at the Department of Cognitive Neurosciene at Maastricht University, The Netherlands |
| May 2013 – May 2016 | Associated Researcher of “Potsdam Embodied Cognition Group“ at University of Potsdam, Germany |
| Oct 2009 – Apr 2014 | Doctoral research in the “Intention and Action” group of Prof. Dr. Ivan Toni as well as in the “Action and Neurocognition” group of Prof. Dr. Harold Bekkering at Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, The Netherlands<br>(Behavioural research, functional Magnetic Resonance Imaging, Voxel-Based Morphometry) |
| Mar 2013 – Apr 2013 | Lab visit in the “Potsdam Embodied Cognition Group“ of Prof. Dr. Martin Fischer at University of Potsdam, Germany<br>(Behavioural research) |
| Apr 2009 – Aug 2009 | Internship (Master project) in the “Action and Neurocognition” group of Prof. Dr. Harold Bekkering at Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, The Netherlands<br>(Behavioural research, functional Magnetic Resonance Imaging) |
| Apr 2007 – Sep 2007 | Internship (Bachelor project) in the “Neurobiopsychology” group of Prof. Dr. Peter König at University of Osnabrück, Germany<br>(Behavioural reseaerch, Eye-tracking) |
| Jan 2006 – Feb 2006 | Internship in the research group of Prof. Dr. Massimo Turratto at the Centre of Mind/Brain Sciences, University of Trento, Italy<br>(Eye-tracking) |

## Teaching Experience

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| Oct 2016 – today | Tutorial in Bachelor course “Skills IV: Academic Writing“ at Maastricht University, Maastricht, The Netherlands. |
| May 2014 – today | Supervision of doctoral dissertation: Caroline Benjamins, Department of Cognitive Neuroscience, Maastricht University, Maastricht, The Netherlands |
| Oct 2009 – today | Supervision of several Bachelor and Master students |
| Nov 2012 | Guest lecture on number cognition in Bachelor course “Toegepaste Onderzoeksmethoden Brein” at Radboud University Nijmegen, The Netherlands |
| Nov 2012 | Workshop “Linux Tips and Tricks” in Donders Institute for Brain, Cognition and Behaviour at Radboud University Nijmegen, The Netherlands |

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| May 2011 | Workshop “Practical Introduction into Expyriment” in Donders Institute for Brain, Cognition and Behaviour at Radboud University Nijmegen, The Netherlands |

## Grants and Awards

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| Nov 2016 | 1st price (“Best Brain-inspired Solution“) at Donders Education Hackathon 2016 - “From Neuroscience to Education in 24 hours!” with “MagniShoot“, a serious Math game for training embodied number concepts |
| Mar 2016 | “Scannexus Developer Project“ fund (36 3T MR scanning hours, ~€12.600) |
| Oct 2012 | “Radboud University Internationalisation Fund“ for outgoing PhD students |
| Oct 2009 | “Cognitive Neuroscience TOPtalent competition” grant (€186.500) for creating own 4-year PhD position in Donders Institute for Brain, Cognition and Behaviour at Radboud University Nijmegen, The Netherlands |

## Research Skills

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| Behavioural methods | Movement kinematics<br>Eye-tracking |
| Neuroimaging | Functional Magnetic Resonance Imaging (fMRI)<br>Real-time fMRI / Neurofeedback<br>7 Tesla Magnetic Resonance Imaging (High-field MRI)<br>Voxel-Based Morphometry (VBM)<br>fMRI Repetition Suppression<br>Multi-Voxel Pattern Analysis (MVPA)<br>Electroencephalography (EEG)<br>EEG Neurofeedback |
| Programming & Data Analysis | Python<br>R<br>Matlab<br>Lua<br>JavaScript<br>Bash<br>Presentation |

## Software Projects

| | |
|---|---|
| Oct 2009 - today | *Expyriment*: An open-source and platform-independent lightweight Python library for designing and conducting timing-critical behavioural and neuroimaging experiments. http://www.expyriment.org. |
| Sep 2015 - Nov 2015 | *RealTimeExportServer*: Export real-time pixel data from a Siemens MR scanner via TCP. https://github.com/fladd/RealTimeExportServer. |
| Dec 2014 - Aug 2015 | *Scan Session Tool*: (f)MRI scan session documentation and data archiving. http://fladd.github.io/ScanSessionTool. |

## Review Activities

Acta Psychologica
Advances in Cognitive Psychology
Experimental Brain Research
Frontiers in Psychology
Journal of Cognitive Psychology
Journal of Experimental Psychology
Journal of Neurophysiology
Perception
Quarterly Journal of Experimental Psychology

## Journal Articles

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| in preparation | Eck, J., Noirhomme, Q., Rosenke, M., Brunheim, S., Krause, F., Benjamins, C., Lührs, M. & Goebel, R. (in preparation). Real-time fMRI self-regulation of functional network connectivity during a visual motion task. |
| submitted | Krause, F., Meyer, M., Bekkering, H., Hunnius, S., & Lindemann, O. (submitted). A shared magnitude representation for perceptual and motor magnitudes in early childhood. |
| in press | Krause, F., Benjamins, C., Lührs, M., Eck, J., Noirhomme, Q., Rosenke, M., Brunheim, S., Sorger, B. & Goebel, R. (in press). Neurofeedback at display: Real-time fMRI-based self-regulation of brain activation acrosss different visual feedback presentations. *Brain-Computer Interfaces*. doi: 10.1080/2326263X.2017.1307096. |
| 2016 | Krause, F., Bekkering, H., Pratt, J., & Lindemann, O. (2016). Interaction between numbers and size during visual search. *Psychological Research.* 1-14. doi: 10.1007/s00426-016-0771-4. |
| 2014 | Krause, F., Lindemann, O., Toni, I., & Bekkering, H. (2014). Different brains process numbers differently: Structural bases of individual differences in spatial and non-spatial number representations. *Journal of Cognitive Neuroscience 26(4)*, 768-776. doi: 10.1162/jocn_a_00518. |
| | Krause, F. & Lindemann, O. (2014). Erratum to: Expyriment: A Python library for cognitive and neuroscientific experiments. *Behavior Research Methods, 46(2)*, 429. doi: 10.3758/s13428-013-0436-9. |
| | Krause, F. & Lindemann, O. (2014). Expyriment: A Python library for cognitive and neuroscientific experiments. *Behavior Research Methods, 46(2)*, 416-428. doi: 10.3758/s13428-013-0390-6. |
| 2013 | Krause, F., Bekkering, H. & Lindemann, O. (2013). A feeling for numbers: shared metric for symbolic and tactile numerosities. *Frontiers in Psychology 4:7*. doi: 10.3389/fpsyg.2013.00007. |
| 2012 | Lindemann, O. & Krause, F. (2012). Zählen mit den Fingern: Verkörperung oder Veranschaulichung? *Lernen und Lernstörungen, 1(1)*, 60-62. doi: 10.1024/2235-0977/a000009. |

## Books

2014 Krause, F. (2014). *Numbers and magnitude in the brain: A sensorimotor grounding of numerical cognition*. Doctoral Thesis, Donders Series 167, ISBN: 978-94-6284-005-8.

## Published Abstracts

2016 Krause, F., Benjamins, C., Lührs, M., Eck, J., Noirhomme, Q., Rosenke, M., Brunheim, S., Sorger, B. & Goebel, R. (2016). Real-time self-regulation across multiple visual neurofeedback presentations. *Proceedings of the 6th International Brain-Computer Interface Meeting, 132*. doi: 10.3217/978-3-85125-467-9-132.

## Other Publications

2017 Krause, F. (2017). Maak getalgrootte voelbar. *Jeugd in School en Wereld*. http://jsw-online.nl/2017/01/09/maak-getalgrootte-voelbaar/.

## Presentations

2017 Invited oral presentation at Cardiff University Brain Research Imaging Centre (CUBRIC), Cardiff, UK
(Title: *"Methodological developments in Neurofeedback: Wibbly wobbly real-timey wimey stuff"*)

2016 Poster at International Brain-Computer Interface (BCI) Meeting 2016, Pacific Grove, California
(Title: *"Real-time self-regulation across multiple visual neurofeedback presentations"*)

2015 Invited oral presentation at symposium "Biofeedback and Realtime Imaging in Brain Research", Marburg, Germany
(Title: *"Advanced fMRI neurofeedback applications using Turbo-BrainVoyager"*)

Poster at 21st Annual Meeting of the Organization for Human Brain Mapping, Honolulu, Hawaii
(Title: *"Fine-grained self-regulation of PPC activity across different visual feedback displays"*)

Invited oral presentation at the 33rd Panama-conference, Veldhoven, The Netherlands
(Title: *"Understanding numerical size through our body"*)

2014 Oral presentation at the 9th European Molecular Imaging Meeting, Antwerp, Belgium
(Title: *"BRAINTRAIN: Taking imaging into the therapeutic domain: Self-regulation of brain systems for mental disorders"*)

2013 Poster presentation at the 16th meeting of the NVP, Egmond aan Zee, The Netherlands
(Title: *"A common magnitude metric in perception: Interference between numbers and size during visual search"*)

Poster presentation at workshop "Development of Numerical Processing and Language – From Neurocognitive Foundations to Educational Applications",

Tübingen, Germany
(Title: *"Different brains process numbers differently: Variances in brain structure related to representational biases in number cognition"*)

Poster presentation at workshop "Interactions between space, time and number: 20 years of research", Paris, France
(Title: *"Different brains process numbers differently: Variances in brain structure related to representational biases in number cognition"*)

Poster presentation at 31th European Workshop on Cognitive Neuropsychology, Bressanone, Italy
(Title: *"Different brains process numbers differently: Variances in brain structure related to representational biases in number cognition"*)

2012 Poster presentation at annual meeting of the Psychonomics Scociety, Minneapolis, Minnesota
(Title: *"Different brains process numbers differently: Variances in brain structure related to representational biases in number cognition"*)

Poster presentation at annual meeting of the Psychonomics Scociety, Minneapolis, Minnesota
(Title: *"A Common Magnitude Metric for Perception Interference between Numbers and Size during Visual Search"*)

Oral presentation at annual meeting of the Scociety for Computers in Psychology, Minneapolis, Minnesota
(Title: *"Expyriment: A Python library for cognitive and neuroscientific experiments*)"

Invited oral presentation at Forschungskolloquium "Embodied Cognition", Potsdam, Germany
(Title: *"Numbers and magnitude in the brain: Evidence for a sensorimotor grounding of numerical cognition*)"

Oral presentation at Tagung experimentell arbeitender Psychologen, Mannheim, Germany
(Title: *"Brain structure predicts representational biases in number cognition*)"

2011 Oral presentation at proceedings of the 15th meeting of the NVP, Egmond aan Zee, The Netherlands
(Title: *"Different brains process numbers differently: Variances in parietal brain structure predict individual differences in number processing"*)

Oral presentation at Donders Theme Meeting, Nijmegen, The Netherlands
(Title: *"Brain structure predicts representational biases in number cognition"*)

Poster presentation at 29th European Workshop on Cognitive Neuropsychology, Bressanone, Italy
(Title: *"Size-congruity in visual search: Evidence for a shared representation"*)

2010 Poster presentation at the 7th FENS Forum of European Neuroscience, Amsterdam, The Netherlands
(Title: *"Neural correlates of numerical stimulus-response compatibility"*)

2009 Poster presentation at proceedings of the 14th meeting of the NVP, Egmond aan Zee, The Netherlands
(Title: *"Action categories in the human premotor cortex"*)

Poster presentation at 8th durch Endo-Neuro-Psycho Meeting, Doorwerth, The Netherlands
(Title: *"Action categories in the human premotor cortex"*)

## International Collaborations

| | |
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| Canada | Jay Pratt, University of Toronto |
| Germany | Oliver Lindemann, University of Potsdam |
| | Sascha Brunheim, University of Duisburg-Essen |
| Netherlands | Rainer Goebel, Maastricht University |
| | Bettina Sorger, Maastricht University |
| | Harold Bekkering, Radboud University Nijmegen |
| | Ivan Toni, Radboud University Nijmegen |
| | Sabine Hunnius, Radboud University Nijmegen |
| UK | David Linden, Cardiff University |
| | David Mehler, Cardiff University |
| US | Marlene Meyer, University of Chicago |
| | Mona Rosenke, Stanford University |

## Miscellaneous

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| Sep 2008 – Aug 2009 | Board member of student journal "CNS Nijmegen" |

## Languages

| | |
|---|---|
| German | Fluent |
| | Mother tongue |
| English | Fluent |
| | 9 years in school |
| | Living and working for 6 months in Blackpool, UK |
| | English study programme "Cognitive Science" |
| | English study programme "Cognitive Neuroscience" |
| Dutch | Level A2 |
| | Living 9 years in Nijmegen, The Netherlands |
| Italian | Level B1 |
| | Living and studying 6 months in Trento, Italy |
| Spanish | 5 years in school |
| French | 5 years in school |

## For references please contact

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|---|---|
| Rainer Goebel | Address: Postbus 616, 6200 MD Maastricht, The Netherlands |
| | Phone: +31 43 388 4014 |
| | Email: rainer.goebel@maastrichtuniversity.nl |
| Harold Bekkering | Address: Postbus 9104, 6500 HE Nijmegen, The Netherlands |
| | Phone: +31 24 36 12632 |
| | Email: h.bekkering@donders.ru.nl |

Ivan Toni — Address: Postbus 9101, 6500 HB Nijmegen, The Netherlands
Phone: +31 24 36 10659
Email: i.toni@donders.ru.nl

Oliver Lindemann — Address: Karl-Liebknecht-Str. 24/25, OT Golm, 14476 Potsdam, Germany
Phone: +49 331 977 2915
Email: oliver.lindemann@uni-potsdam.de

**Extracurricular activities**

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|---|---|
| 1992 – 2009 | Competitive athlete, coach and judge in Wheelgymnastics<br>Having won several medals at National and World Championships<br>Junior World Champion in Wheelgymnastics 2001 |
| Aug 2006 – Apr 2007 | Working for “Diamag GmbH” in Grünberg, Germany |
| May 2004 – Nov 2004 | Working for “Stageworks Worldwide Productions” as professional artiste (Wheelgymnast/Dancer) in circus musical “Eclipse” in Blackpool, UK |
| Sep 2002 – Aug 2003 | Civil service at “Asklepios Klinik” in Lich, Germany |

Maastricht, March 14, 2017