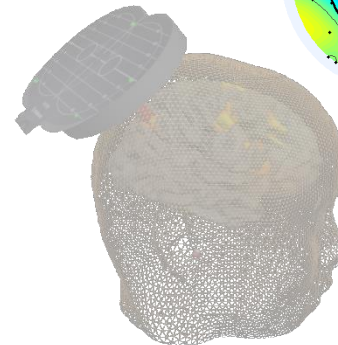# Research Master Cognitive Neuroscience
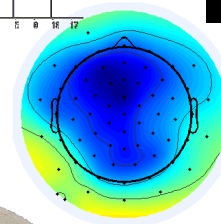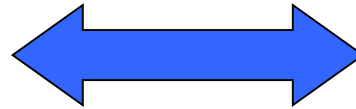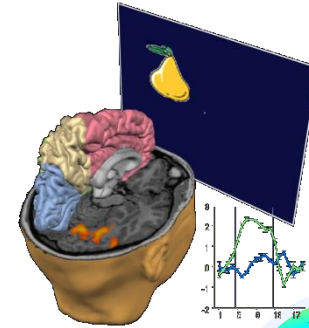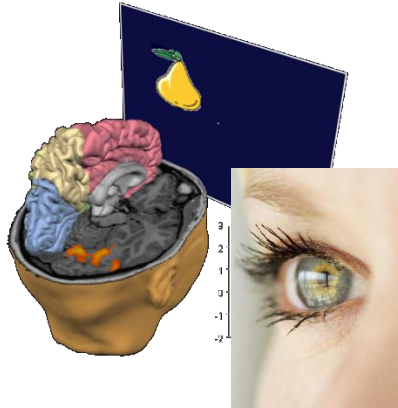
Giancarlo Valente
November 17, 2018

Cognitive Neuroscience
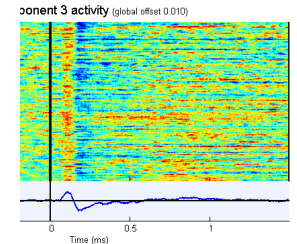
Interdisciplinary field: psychology, biology, bioengineering, mathematics, physics, computer science ...

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I. Perception, cognition & behaviour

1. Visual Perception & Attention
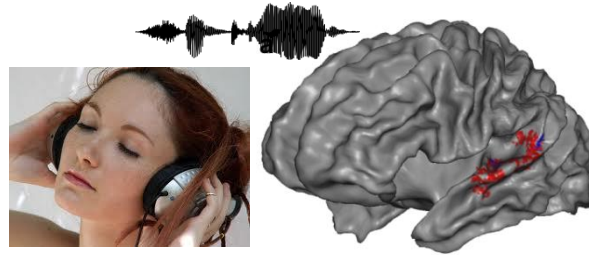
2. Audition, Language & Cross-modal integration
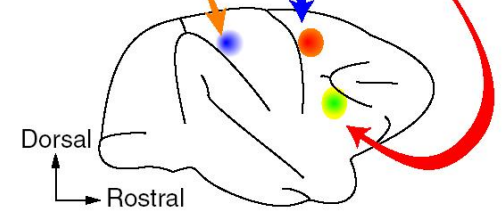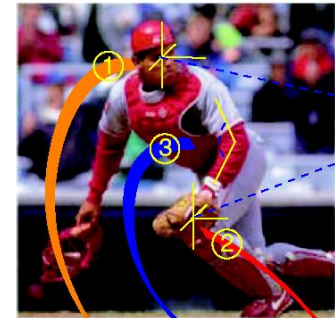
3. Integration of Sensory & Motor Systems

Dorsal

Rostral

4. Memory & Learning

5. Translational Neuroscience

Maastricht University

II. Methods & applications of neuroimaging techniques

1. **functional MRI (2x)**
2. **MRI/DTI**
3. **EEG/MEG**
4. **TMS**

Theoretical core courses

↕

Hands-on skills trainings

Mijn-Album.nl

III. Academic and research skills

All RM tracks

Presentation and writing skills, statistics

Cognitive Neuroscience
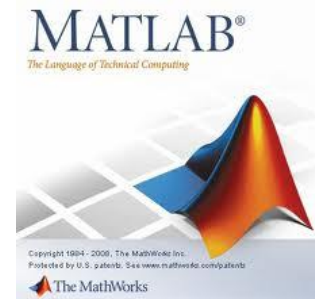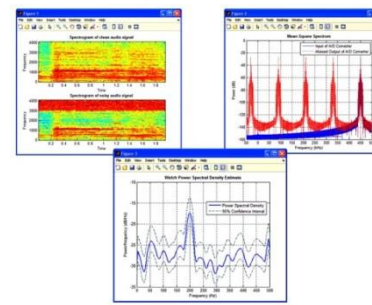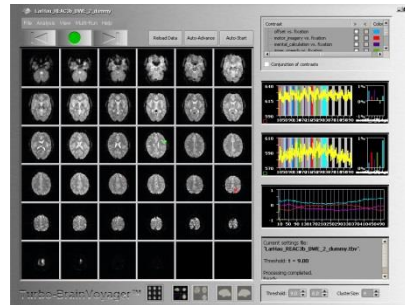

Extensive training in experimental design, EEG/fMRI signal analysis, basic maths

CN perspectives I: Clinical applications

TMS induced brain plasticity
→   guiding brain recovery after stroke

Alexander Sack

Cortical mechanisms of Auditory Scene Analysis
→   intelligent hearing aids

Elia Formisano

Real-time fMRI & Neurofeedback
→   treatment of depression, Parkinson
→   motor-independent communication with locked-in patients

Rainer Goebel

Maastricht University

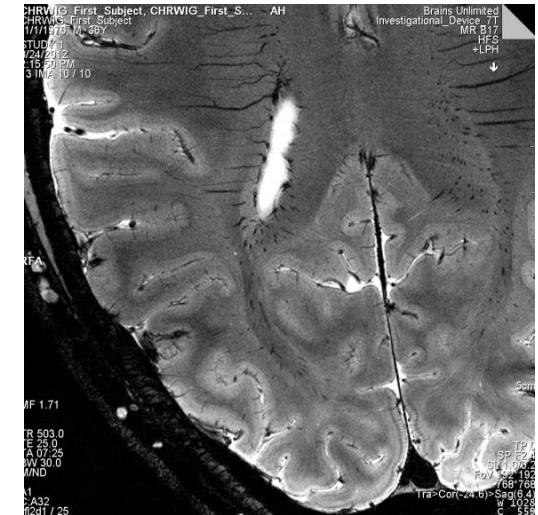# CN perspectives II: Ultra high-field MRI
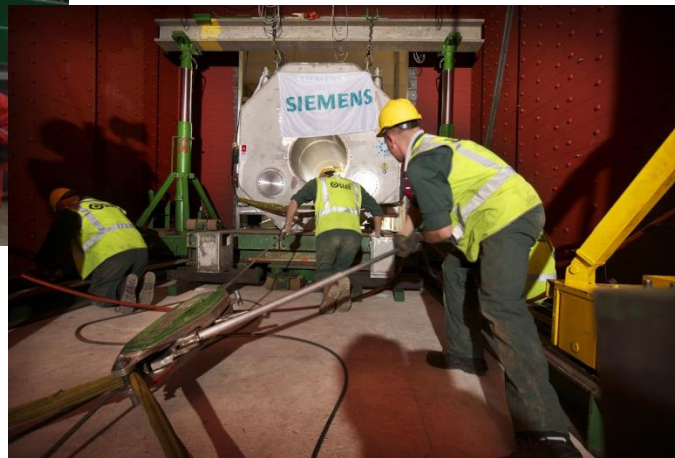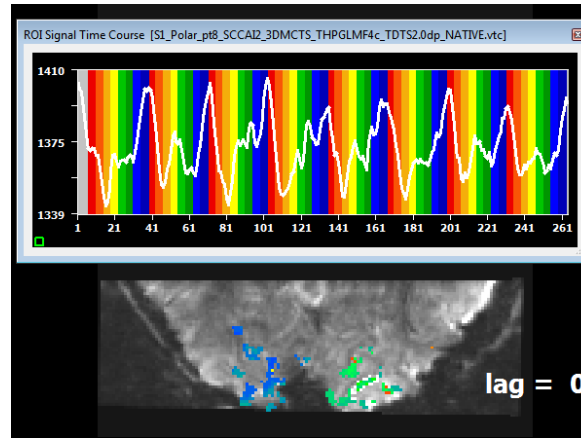
Own research possibilities

- ***Research Electives* and *Grant Writing***

- **Research Internship** (~8 months)

    - excellent possibilities within CN group

    - and in one of many excellent laboratories within our large network of national and international collaborations (*for examples see website).*

Examples Internships CN

Matteo Bastiani, FPN:
Development of high resolution fiber tracking (DTI) methods

Jan Zimmerman, University of Minnesota, USA:
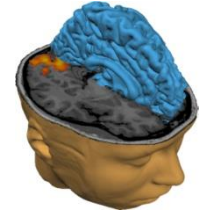Direction selective neural columns in human V5 measured at 7T fMRI

Kiki vd Heijden, FPN:
Spatial audition in virtual reality & fMRI

Danique Jeurissen, Harvard Medical School, Boston, USA:
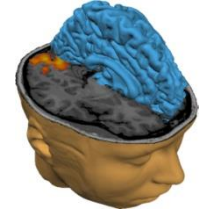Brain connectivity network underlying moral judgment

Isabelle Habes, University of Cardiff, UK:
Treating depression using fMRI neurofeedback

Annette Giani, University of Würzburg, Germany:
Treating Tinnitus with TMS

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Career perspectives

Optimal preparation for:

- **fundamental brain research** in academic setting

- using neuroimaging techniques in **applied/clinical research** settings (see CN perspectives I)

- **biomedical industry**, *e.g.,* BrainsUnlimited (see CN perspectives II)

CN staff @ Maastricht Brain Imaging Center

More information, Questions?

- CN alumni & current students

- CN coordinator: Giancarlo Valente

giancarlo.valente@maastrichtuniversity.nl

Maastricht University

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