Methods & models for fMRI data analysis – HS 2019

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Swiss Federal Institute of Technology Zurich

Modul Mantelstudium (Beginn Herbstsemester – 16.09.2019)

24.09	Tutorial (2h): UZH/ETH: Scanning of own Experiment ***(Sandra Iglesias)***, MED: Setting up Matlab and SPM on own computers, Basic functions of SPM ***(Jakob Heinzle)*** Lecture(2h): Foundations of functional MRI: neurophysiology and physics ***(Jakob Heinzle)***	UZH Med & ETH/UZH
01.10.	Tutorial (2h): MED: Scanning of own Experiment ***(Sandra Iglesias)***, ETH/UZH: Setting up Matlab and SPM on own computers, Basic functions of SPM ***(Jakob Heinzle)*** Lecture(2h): Why is fMRI important for medicine? ***(Klaas Enno Stephan)***	
08.10.	Lecture (2h): Introduction to Spatial preprocessing of fMRI images ***(Sam Harrison)*** Tutorial (2h): Analysis of own data (Preprocessing pipeline)	
15.10.	Lecture (2h): The General Linear Model for fMRI analyses and inference I ***(Klaas Enno Stephan)*** Tutorial (2h): Analysis of own data (Research questions)	
22.10.	Lecture (2h): The General Linear Model for fMRI analyses and inference II ***(Klaas Enno Stephan)*** Tutorial (2h): Analysis of own data (GLM and Statistics)	
29.10.	Lecture (2h): Event-related fMRI and design efficiency ***(Jakob Heinzle)*** Tutorial (2h): Analysis of own data and preparation of presentation	
05.11.	Lecture (2h): Experimental design and Resting State Analysis ***(Sara Tomiello, Sandra Iglesias)*** Tutorial (2h): Short presentation of results of analysis of own data (MED)	

12.11.	Lecture (2h): Group level analysis ***(Sandra Iglesias)*** Tutorial (2h): Group level analysis	ETH/UZH
19.11.	Lecture (2h): Noise models in fMRI and noise correction ***(Matthias Müller-Schrader)*** Tutorial (2h): PhysIO	
26.11.	Lecture (2h): Bayesian inference and Bayesian model selection ***(Klaas Enno Stephan)*** Tutorial (2h): BMA and BMS	
03.12.	Lecture (2h): Computational Neuroimaging (model-based fMRI) ***(Birte Toussaint)*** Tutorial (2h): Model based fMRI	
10.12.	Lecture (2h): Introduction to Dynamic Causal Modelling ***(Stefan Frässle)*** Tutorial (2h): DCM analysis	
17.12.	Exam (10:00-11:30)	

FAQs

Course homepage:
https://www.tnu.ethz.ch/en/teaching/hs-2019/methods-models-for-fmri-analysis.html

Exam ETH/UZH: Graded exam (full Course)

Med Mantelstudium: Testat (MED)

Attendance requirements: 11/13 presentations

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!!! Check the rules of the program you have signed up for !!!

Exam

- “Exam” for medical students (first half of course):
  - **05.11.2019: 10:15 – 12:00**
  - Presentation and hand in of own SPM analysis
  - Pass is required to get credit points

- Exam for all other students :
  - **17.12.2019: 10:00-11:30**
  - (36 MC questions, 90 min time)
  - Pass is required to get credit points

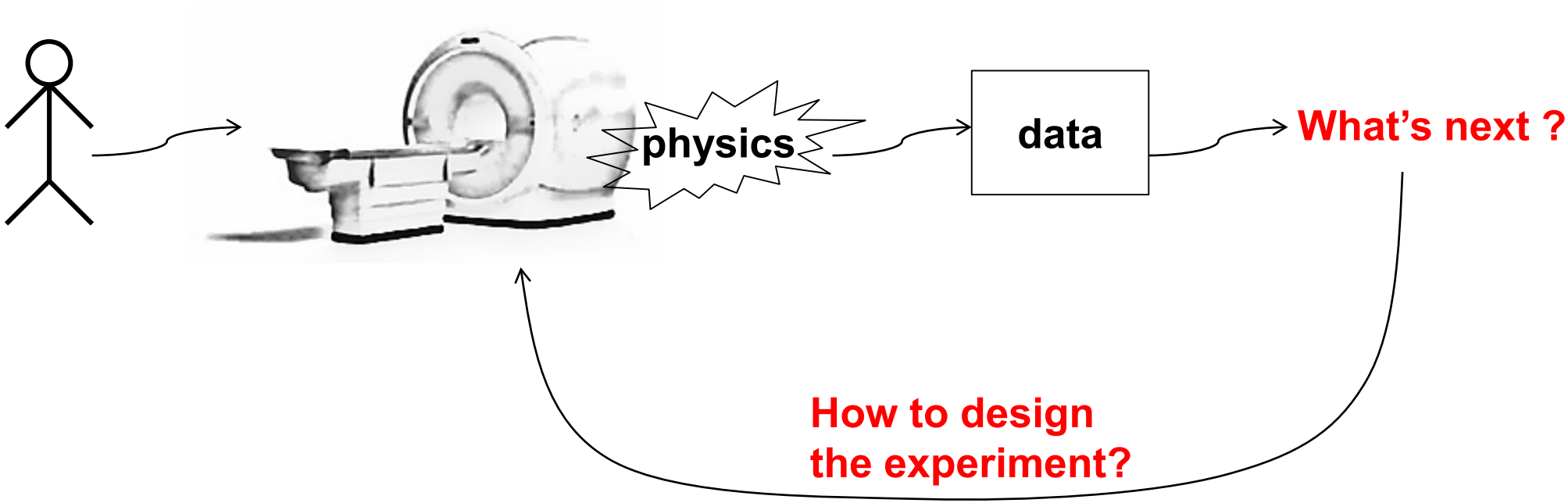
!!! Check the rules of the program you have signed up for !!!

Presentation of medical students

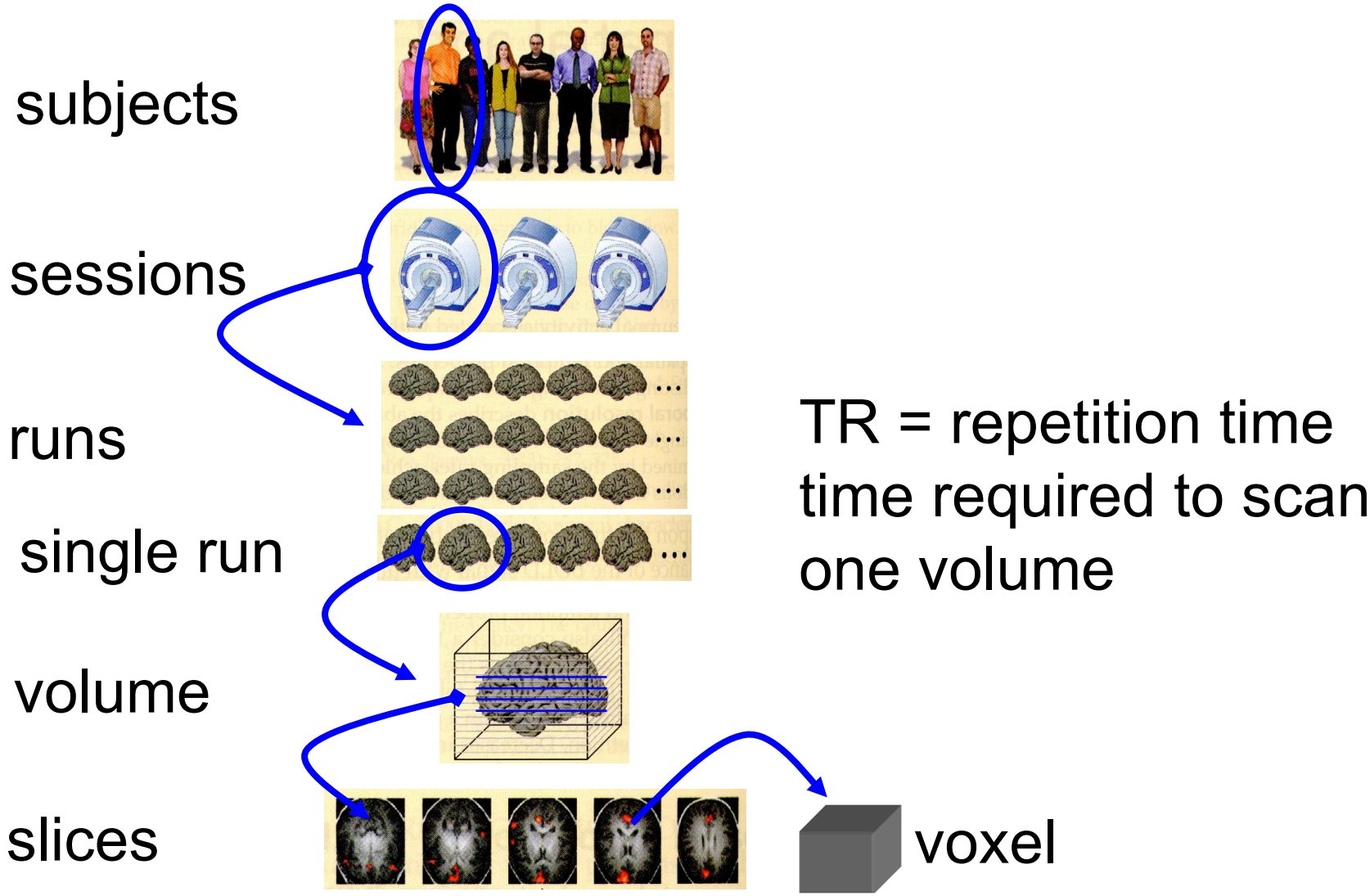
- Short presentation 10 min + 5 min questions on the analysis you made with our own data.
- Presentations are given in groups of 2 or 3 people.
- Every student needs to speak (roughly 3 min each).
- Possible layout:
  - Introduction: What was the question we wanted to answer?
  - Methods: What did we do?
  - Results: Present your findings.
- You need to hand in your presentation and your analysis.

Steps of an MR experiment …

… and what this course will deal with



Terminology of fMRI



Statistical Parametric Mapping (SPM)