Tutorial: Thursday 17.07.2014 at 4 p.m. in the HS4 of the physics building

Correlations:

Why do we need the cross-correlation (for neural systems)?

Why the auto-correlation?

Which neural connectivities can explain the cross-correlations (A) and (B) (draw)?

Explain the model (C) for sound localization in your own words.

Networks:

Name three properties of associative memory systems.

Why do we need a nonlinear neuron model $F$ for hetero-associative networks?

What are the differences between hetero- and auto-associative memory networks?

Maps:

Different body parts are represented differently in the motor and sensory cortex. Please explain the resulting effects on the functioning of motor performance and sensors.

What are place fields?

Please explain the diagram. Why do the place fields rotate?

What is verticity? Why is this important for models of orientation maps?

Learning:

What are the differences between unsupervised, reinforcement, and supervised learning?

Why do we need the threshold in the covariance-rule?

What is a „eligibility trace“, what is its standard shape (draw) and its functional role?

Name several possibilities to depolarise the postsynaptic site (and, therefore, to „de-block“ the NMDA channels).