Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

MARIE CURIE ACTIONS

Towards the development of a robotic adaptive self-protective system

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University of Hamburg
BRAIN node

RobotDoC

Robotics for Development of Cognition

My research project

- ***Robotic adaptive self-protective system*** based on a neurocomputational amygdala model of fear conditioning.

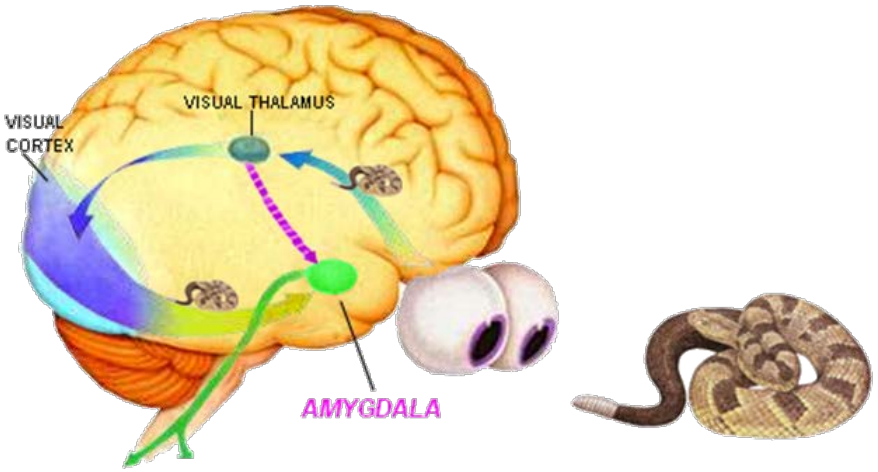
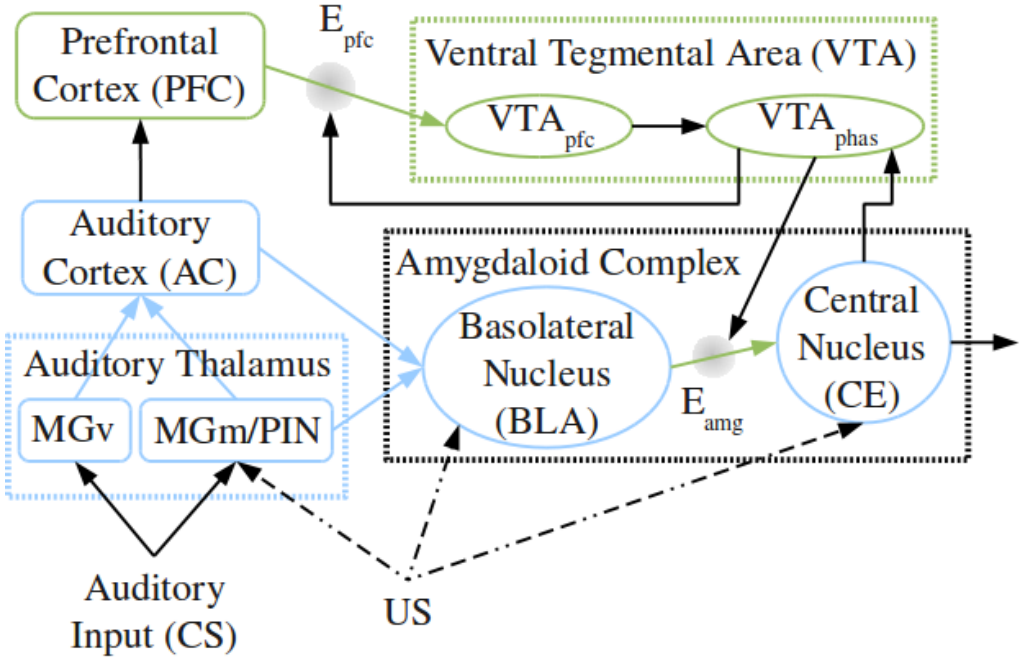
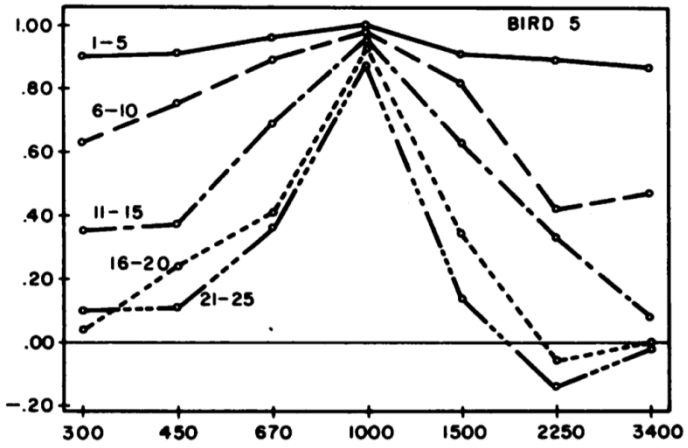


Illustration based on LeDoux JE (1994) Emotion, Memory, and the Brain. Scientific American

Technical overview





Navarro-Guerrero, N., Lowe, R. and Wermter, S. (2012). A Neurocomputational Amygdala Model of Auditory Fear Conditioning: A Hybrid System Approach. (in press) in proceedings of the annual International Joint Conference on Neural Networks (IJCNN)

Hoffman, H. S. and Fleshler, M. (1961). Stimulus factors in aversive controls: The generalization of conditioned suppression. Journal of the experimental analysis of behavior, 4:371-378.

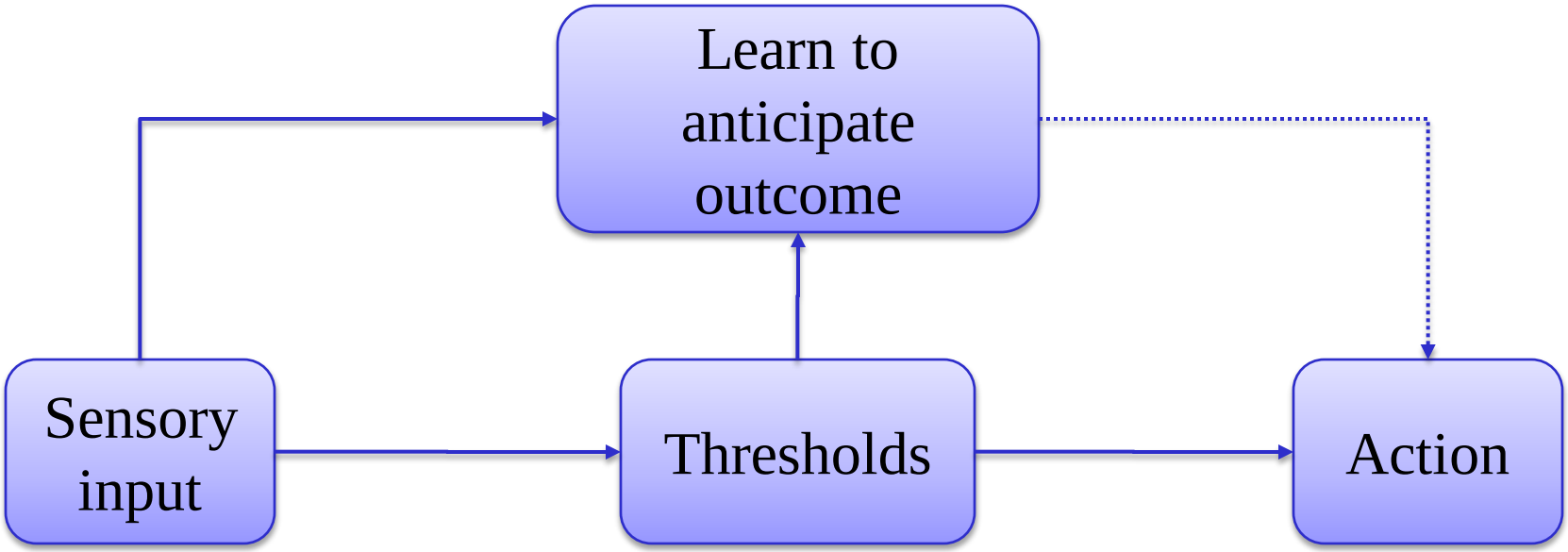
Computational cognitive modelling

Study and assistance of humans

Development of better computational models

Impact of computational models of fear conditioning in robots

Impact of computational models of fear conditioning in robots

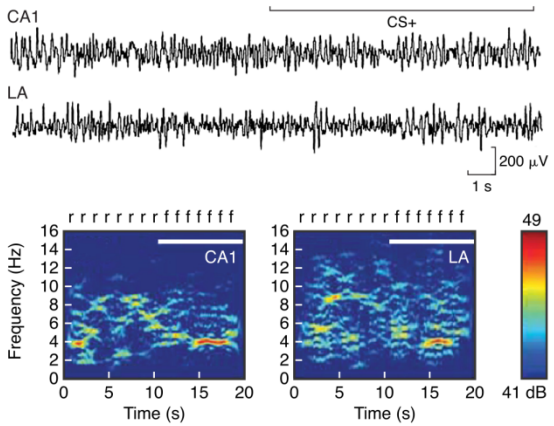


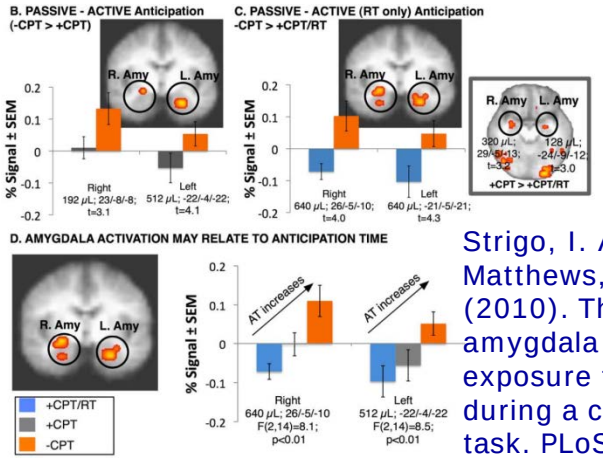
Long-term implication: Study of affective disorders

Foreseen applications of computational models of fear conditioning:

- Lesion study, reliably replication of lesions and cells like recordings.
- Study the degree of involvement of different structures, codification of information, etc

Pape, H.-C. and Pare, D. (2010). Plastic synaptic networks of the amygdala for the acquisition, expression, and extinction of conditioned fear. Physiological reviews, 90(2):419-463.





Strigo, I. A., Simmons, A. N., Matthews, S. C., and Craig, A. D. (2010). The relationship between amygdala activation and passive exposure time to an aversive cue during a continuous performance task. PLoS ONE, 5(11):e15093+.