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Influence of eye-movements on multisensory stimulus localization: experiments, models and robotics application

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Objectives:

Multimodal merging in autonomous agent

- Identification (what to merge) -> statistical correlations
- Fusion (how to merge) -> how to get weighting?

Hypothesis: active perception

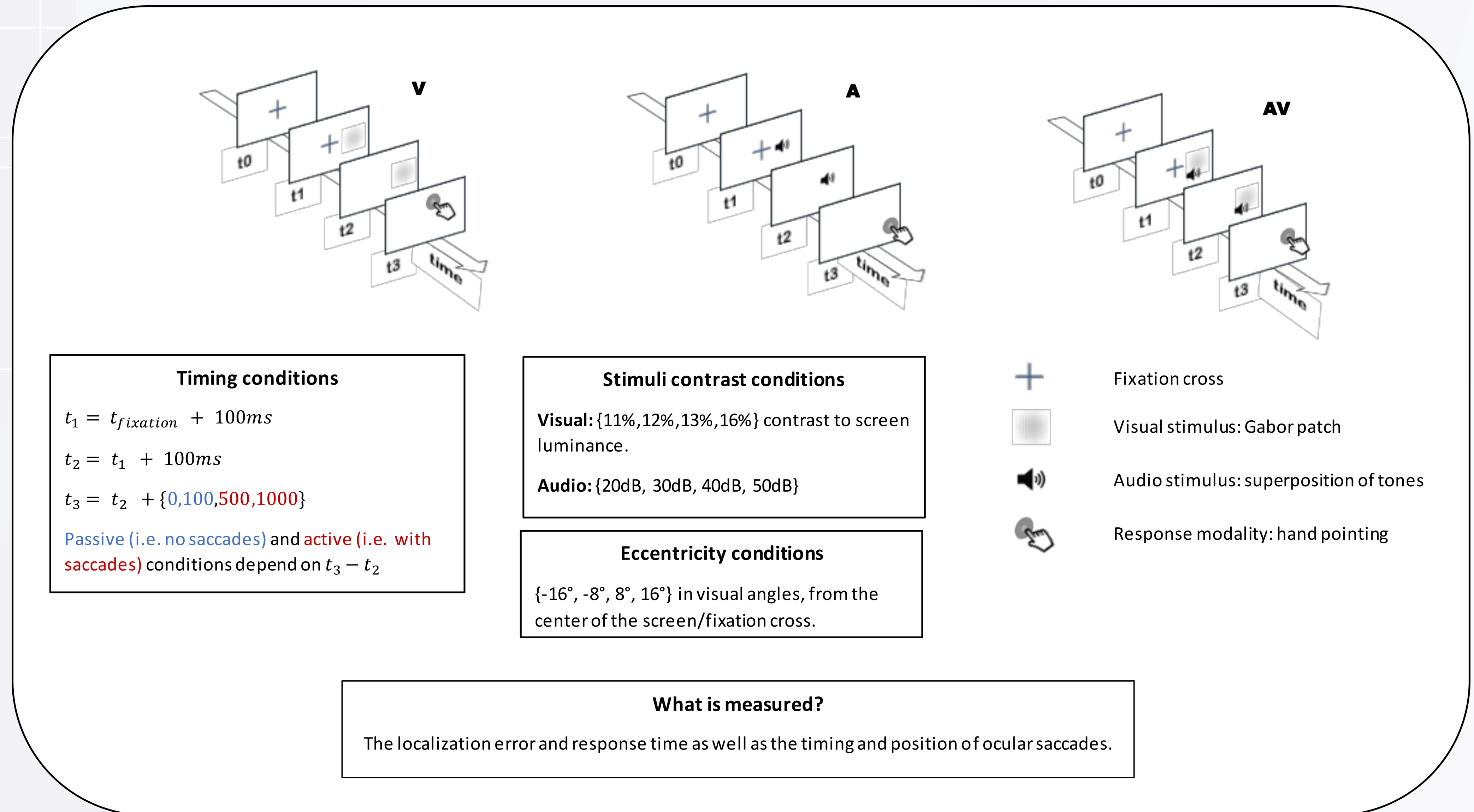
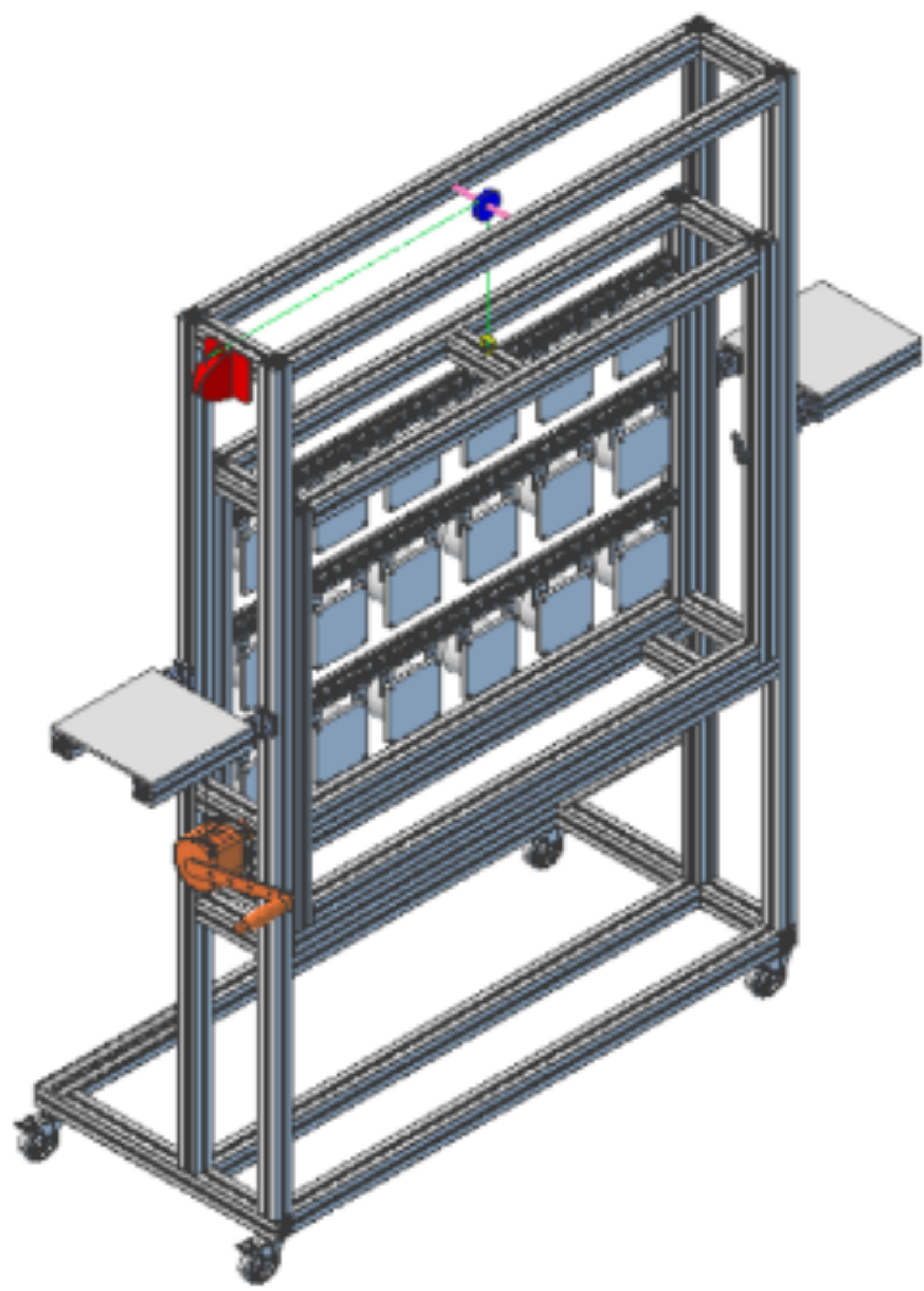
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- Univ. Grenoble Alpes (LJK, LPNC)
- Hoomano

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- CRNL
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- the CNRS' Interdisciplinary Mission
- the Auvergne-Rhône-Alpes Region

Psychophysics experiments (ongoing work):



Modeling of superior colliculus (ongoing work):

Hypothesis: active perception provides more cues on sensory relevance

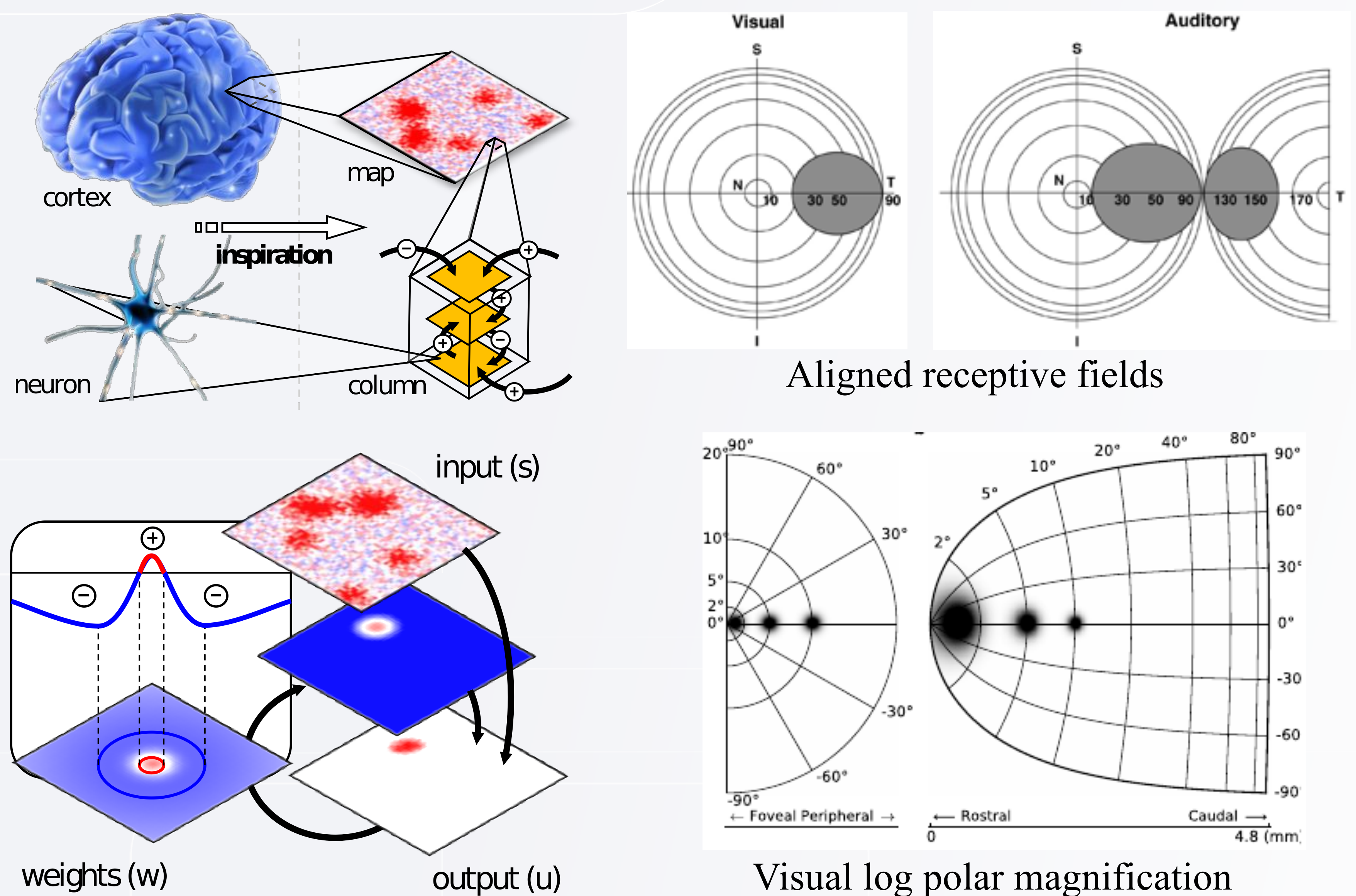
- log polar visual encoding in the superior colliculus may provides more weight to the centered stimuli (after saccade)

Modeling: Dynamic neural fields

- mesoscopic modeling (of the cortical surface)
- good model for saccade dynamic (motor command in the superior colliculus)
- dynamical system of spatial competition/fusion

Open questions:

- frame of reference of visuo-auditory stimuli
- individual and population neuronal merging operation
- variance encoding in DNF



Improving social robots (future work):

Open questions:

- Does the computational models adapt to noisy data of real robots?
- What dimensions are (contextually) relevant in attention and goal achieving?
- How to chain simple active perception decision within a global behavior?
- How to mix active perception with a global task completion?
- Does merging mechanisms apply from simple to more abstract stimuli?

