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

Mathieu Lefort, Jean-Charles Quinton, Simon Forest, Adrien Techer, Alan Chauvin, Marie Avillac

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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

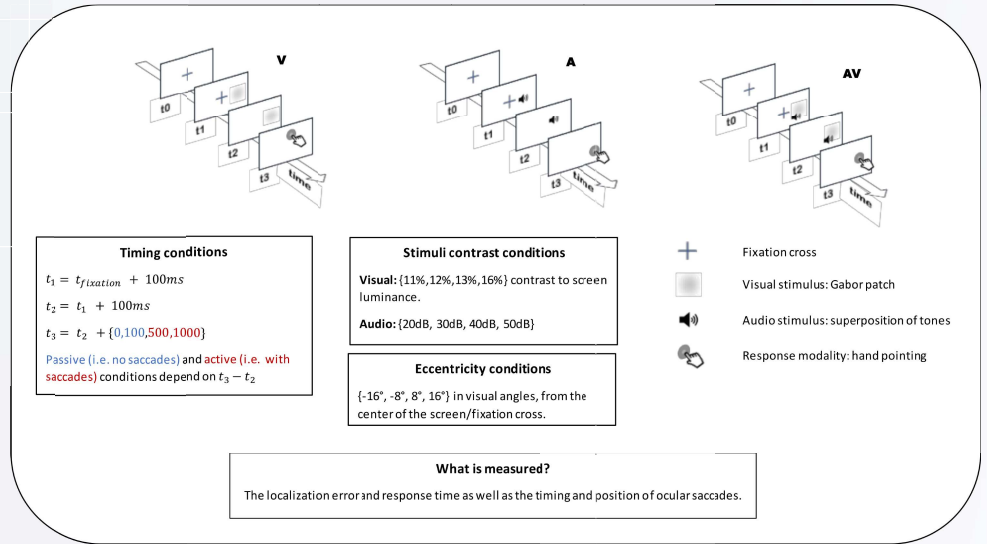
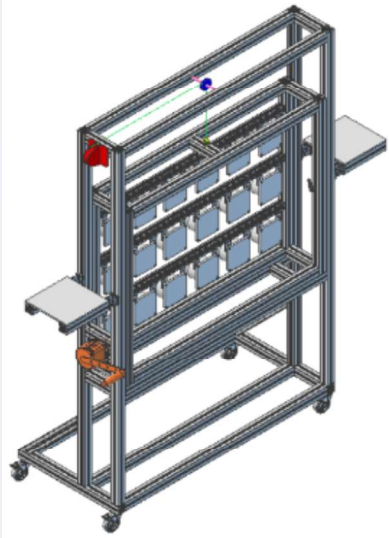
## Partners:

- Lyon 1 University (LIRIS, CRNL)
- Univ. Grenoble Alpes (LJK, LPNC)
- Hoomano

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- CRNL
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## Psychophysics experiments (ongoing work):



## Modeling of superior colliculus (ongoing work):

**Hypothesis:** active perception provides more cues on sensory relevance

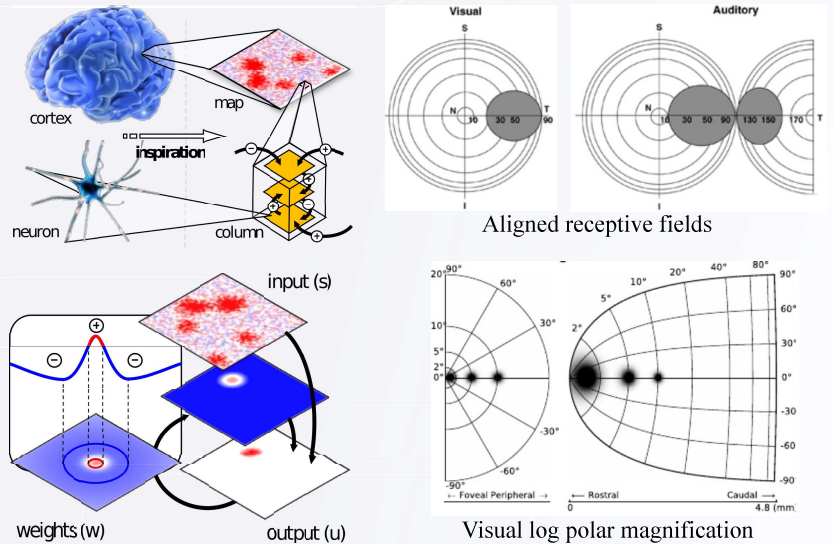
- log polar visual encoding in the superior colliculus may provide more weight to the centered stimuli (after saccade)

### 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?

