



UNIVERSITEIT VAN AMSTERDAM



Cognitive and Systems Neuroscience

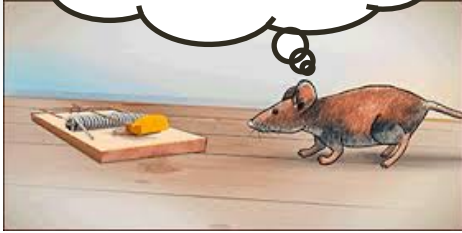
Swammerdam Institute for Life Sciences

Jeannette Lorteije



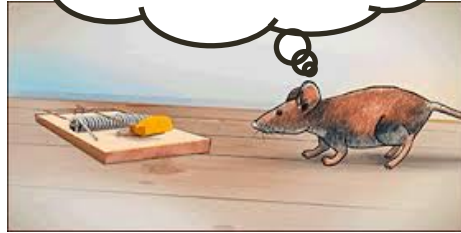


Smell: cheese
See: device



Sensory
Processing

cheese in a
device



Multi-Sensory
Processing

It's a trap!



Perceptual
decision



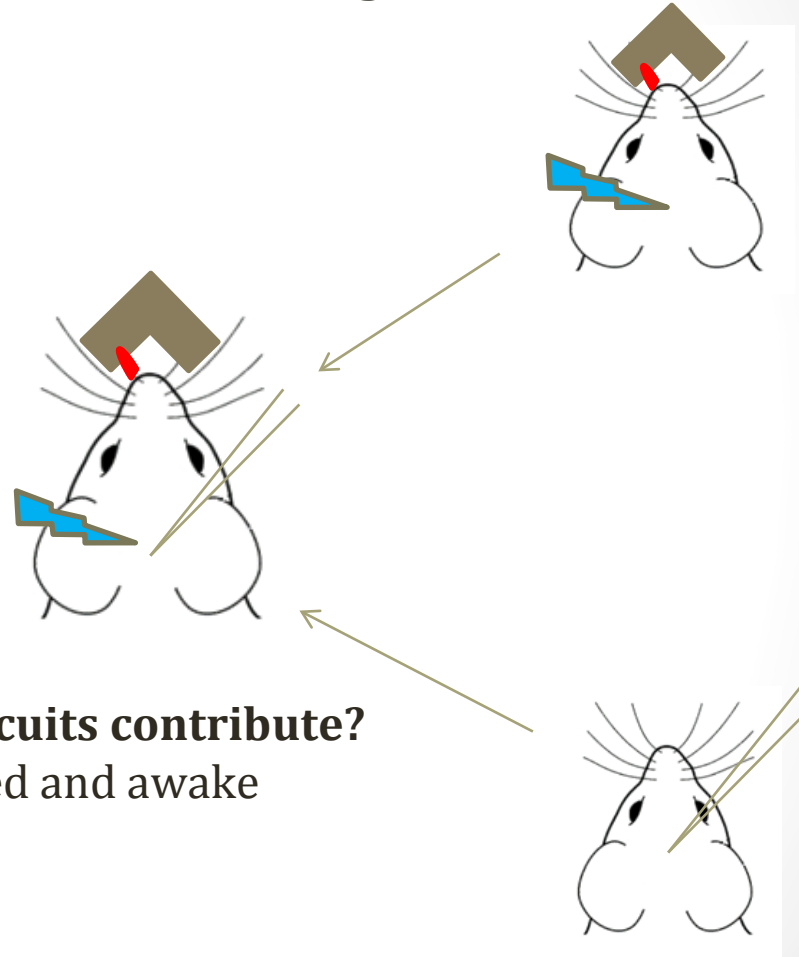
Motor Action!

How are Multisensory Decisions made?

- WHICH areas contribute to multisensory decision making, and WHEN?
- How do individual neurons and local circuits contribute?

WHICH areas contribute to multisensory decision making, and WHEN?

Behaviour and optogenetics



How do individual neurons and local circuits contribute?

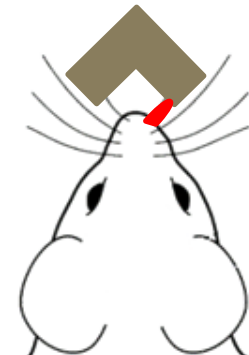
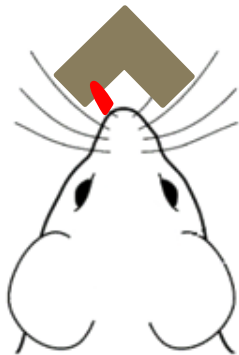
Electrophysiology (whole-cell): anesthetized and awake

Behavioral task

Left → Lick Left



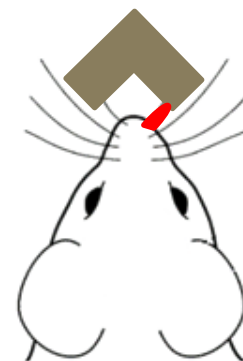
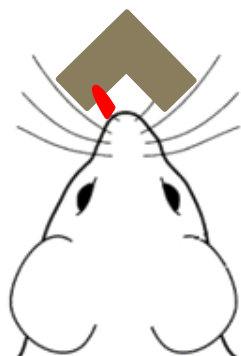
Right → Lick Right



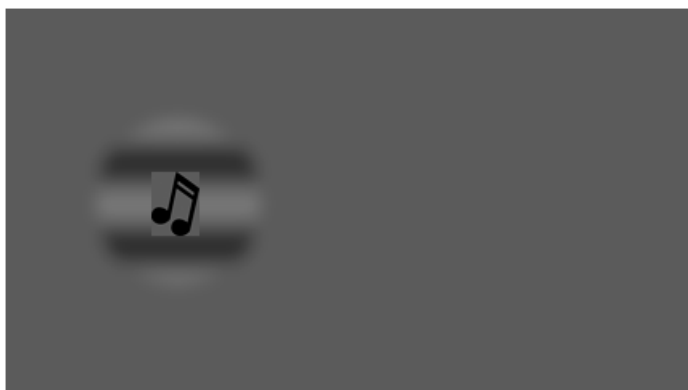
Left → Lick Left



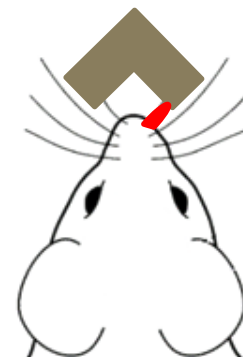
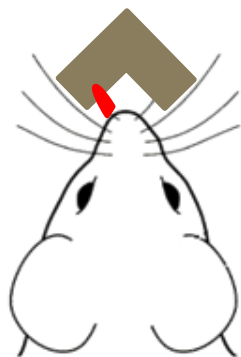
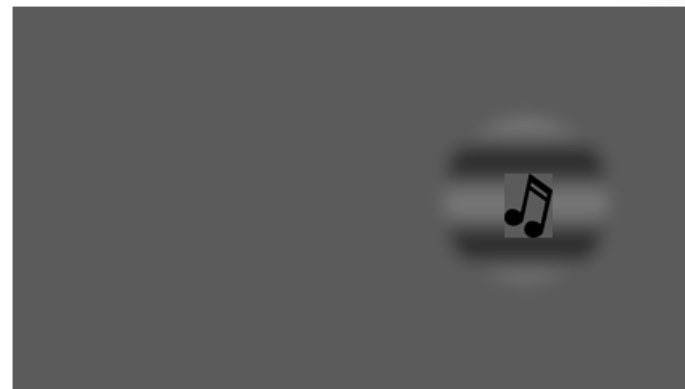
Right → Lick Right



Left → Lick Left

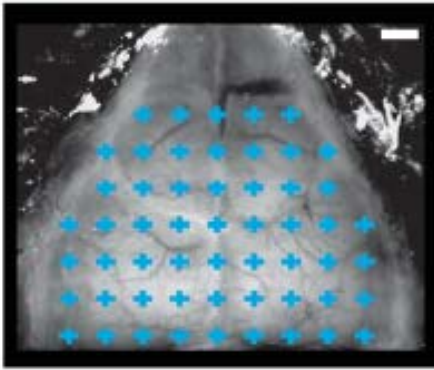


Right → Lick Right

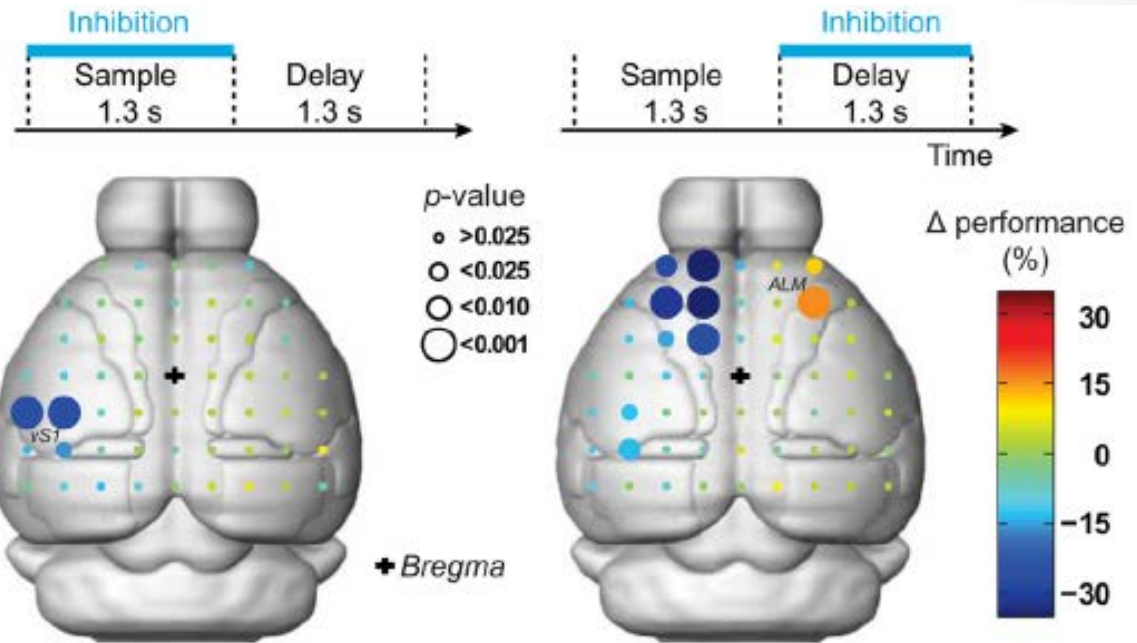


Optogenetic silencing

A



B

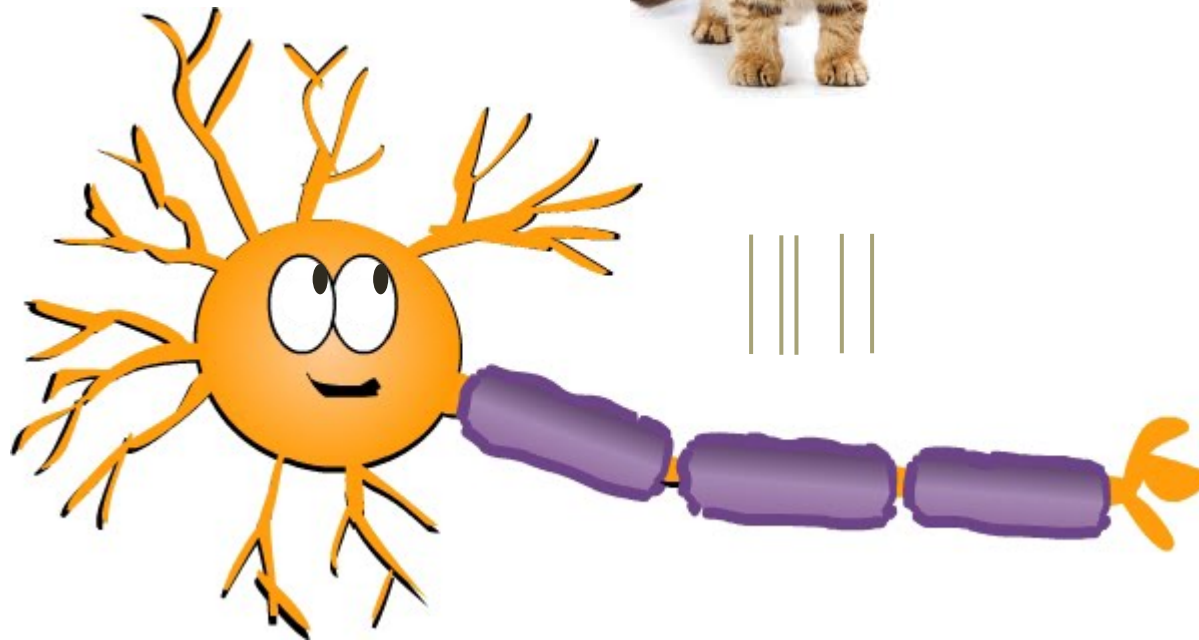


Guo et al 2014

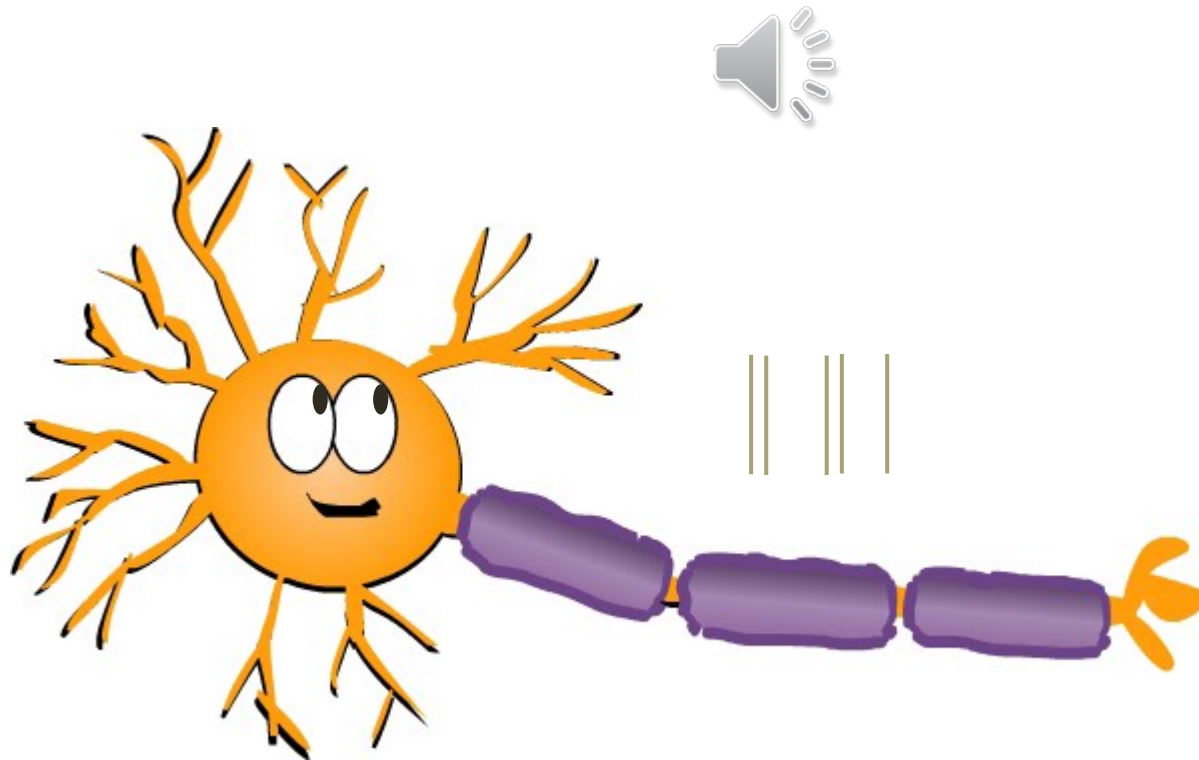
Silencing activity in a small cortical area: measure effect on behaviour.

High temporal resolution: track the contribution of areas across the cortex over time!

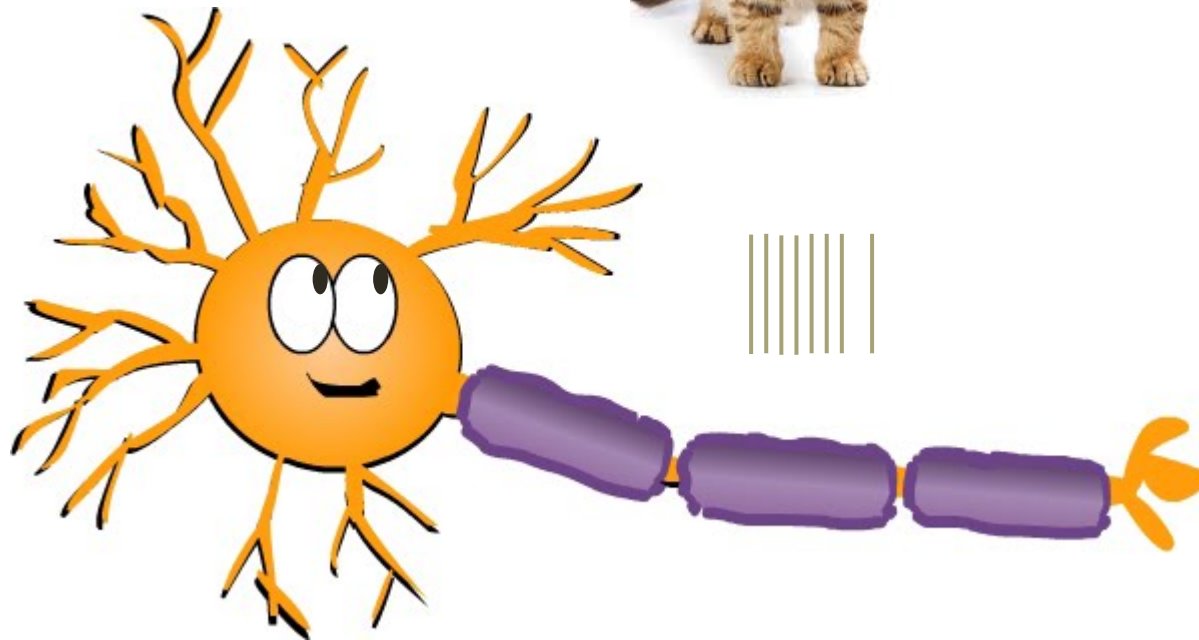
Multimodal neuron



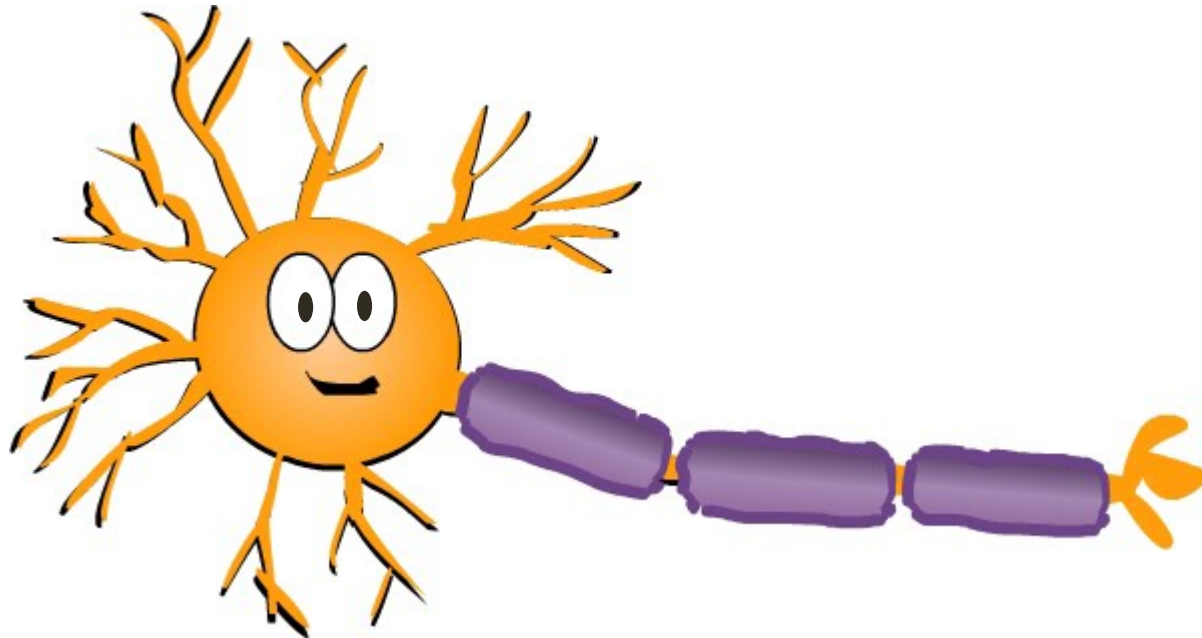
Multimodal neuron



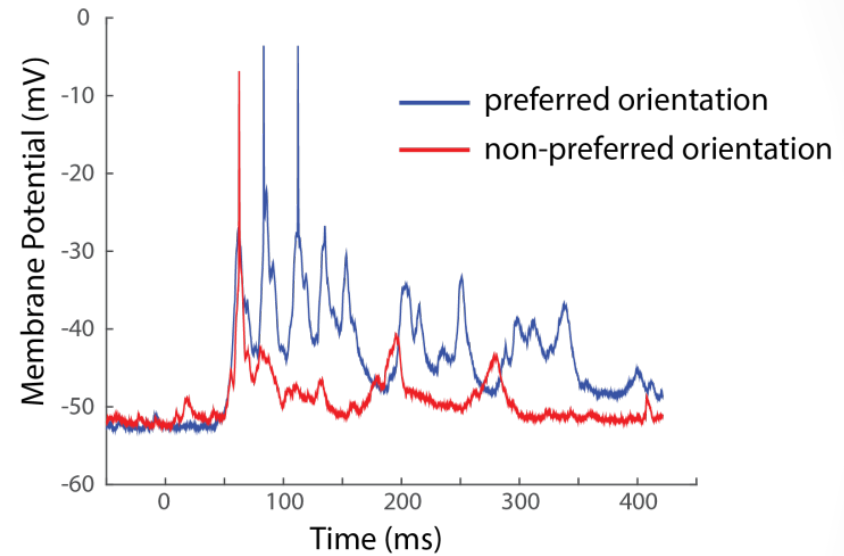
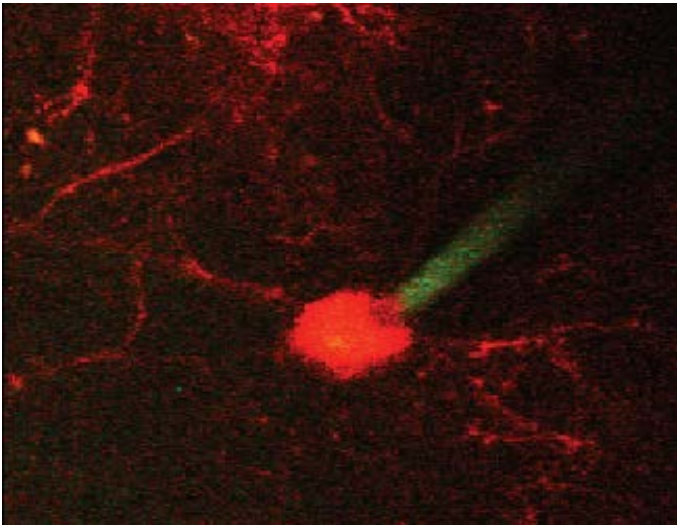
Multimodal neuron



But what's going on INSIDE the neuron?



Targeted whole-cell recordings in vivo



There's no I in team



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What would an intern do?

help develop behavioral paradigms.

help with surgeries.

train animals on the tasks.

analyse and interpret behavioral data.

learn how to perform intrinsic imaging to identify target areas.

help perform the optogenetic stimulation during task performance.

help perform the electrophysiological recordings

perform histology.

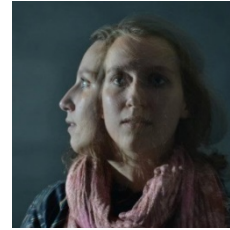
analyse and interpret the physiological data

Other projects in the SILS-CSN group



Charlotte Oomen

Pattern Separation in rats
Behavioral training, DREADD & ephys
Experiments and data analysis



Lianne Klaver

Multisensory integration in ferrets
Extracellular recordings
Experiments and data analysis



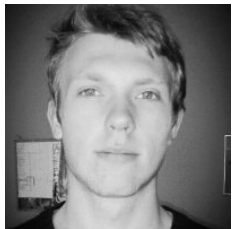
Tom Sikkens

Multimodal odd-ball in mice
Behavioral training &
Extracellular recordings
Experiments and data analysis



Conrado Bosman

Inter-areal communication in humans
Intracranial recordings
Data analysis



Sven van der Burg

Multisensory integration in mice
Behavioral training &
Extracellular recordings
Experiments and data analysis



Guido Meijer

Multisensory integration in mice
Two-photon calcium imaging
Experiments and data analysis

<http://sils.uva.nl/research/collaboration-initiatives/content/cognitive-and-systems-neuroscience/cognitive-and-systems-neuroscience.html>

How to apply

- For more info contact the researcher
- To apply: e-mail to Conrado Bosman:
C.A.BosmanVittini@uva.nl
- Include
 - Motivation and project preference
 - CV and grade list (also bachelor)
 - Timeslot in which you would like to join the lab
- Before November 1st
- At the start of November we will match students to projects

