

Fast and accurate, and unsupervised and time-adaptive EEG-based auditory attention decoding for neuro-steered hearing devices

Simon Geirnaert

with Rob Zink, Tom Francart, Alexander Bertrand

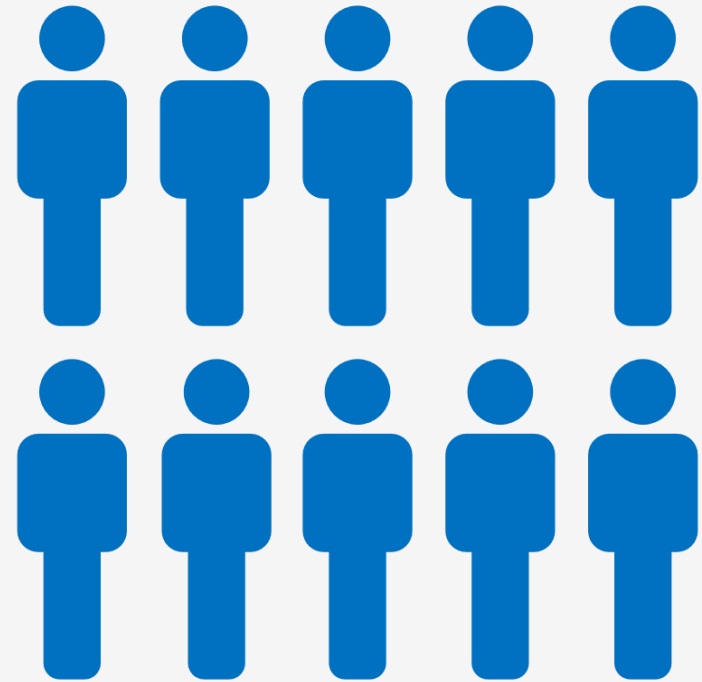
5%



5%



430 000 000



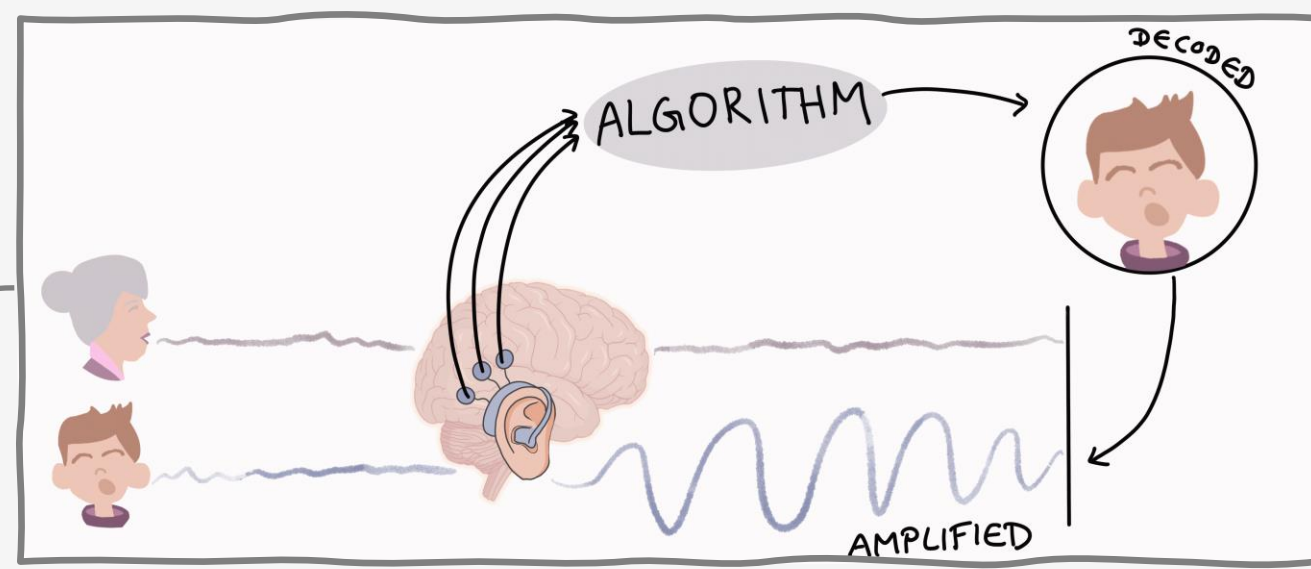
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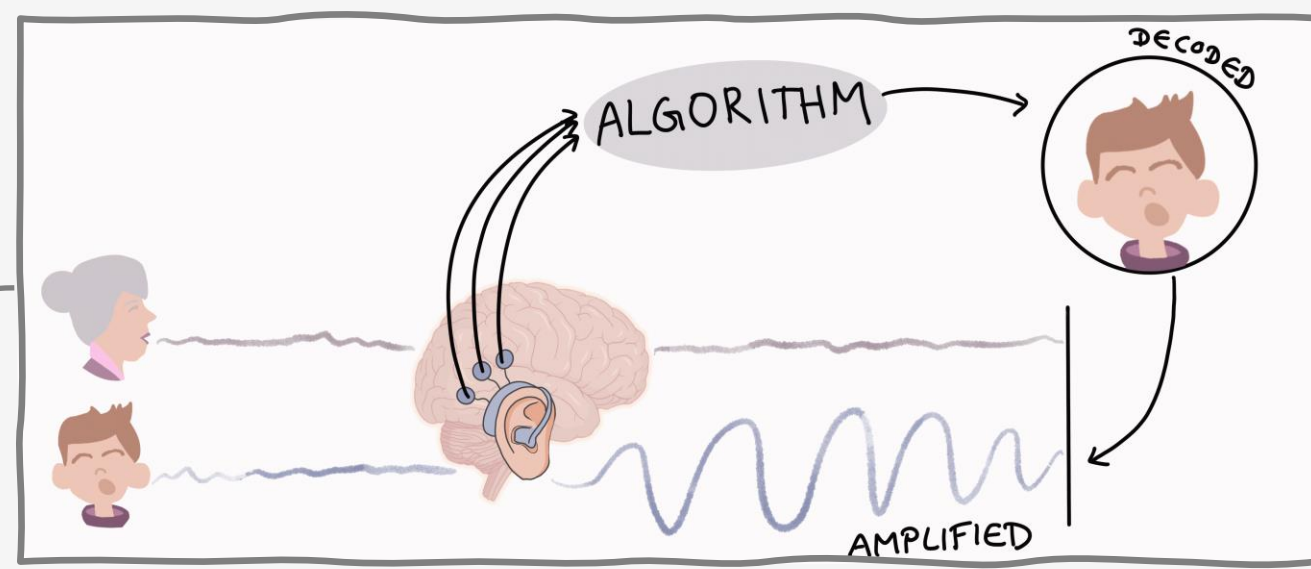




Auditory Attention Decoding (AAD) problem

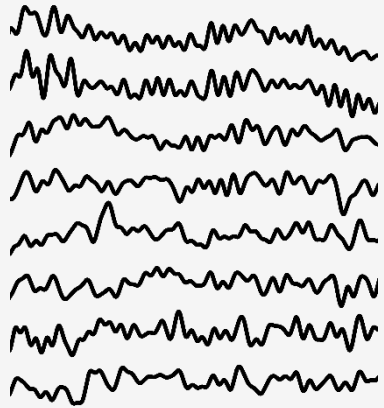


Neuro-steered hearing aid

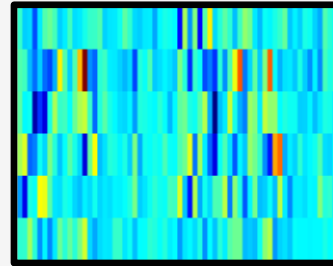


Stimulus reconstruction algorithm

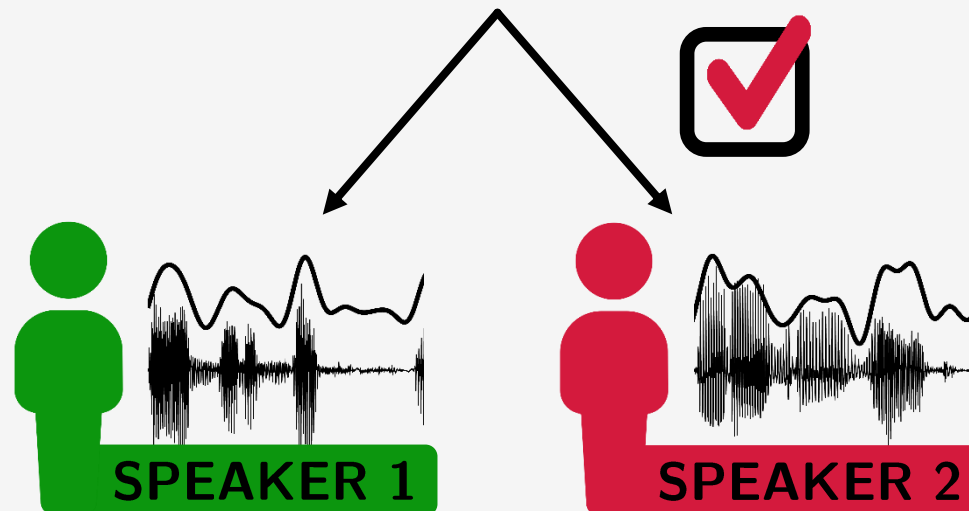
EEG



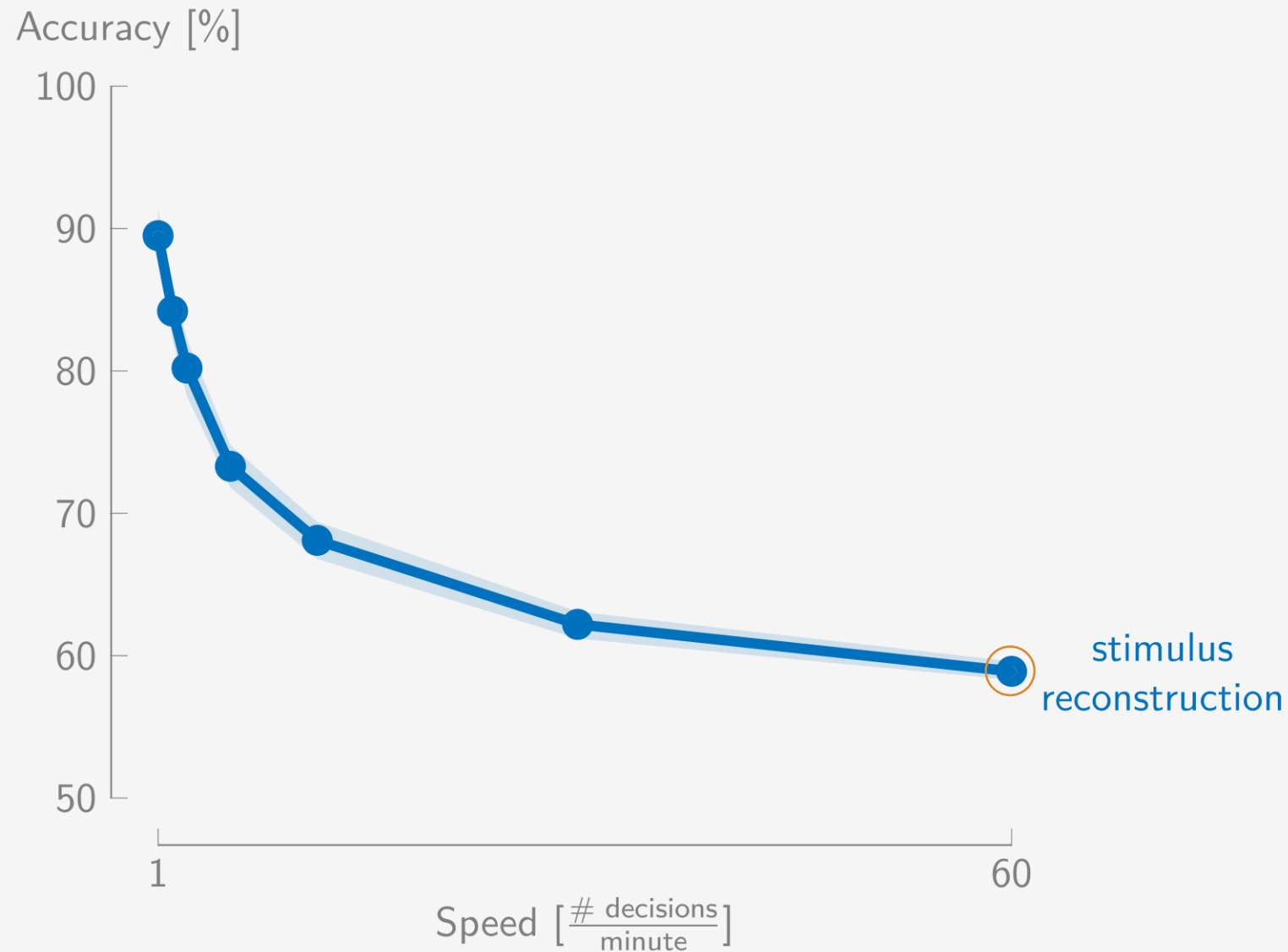
Neural decoder



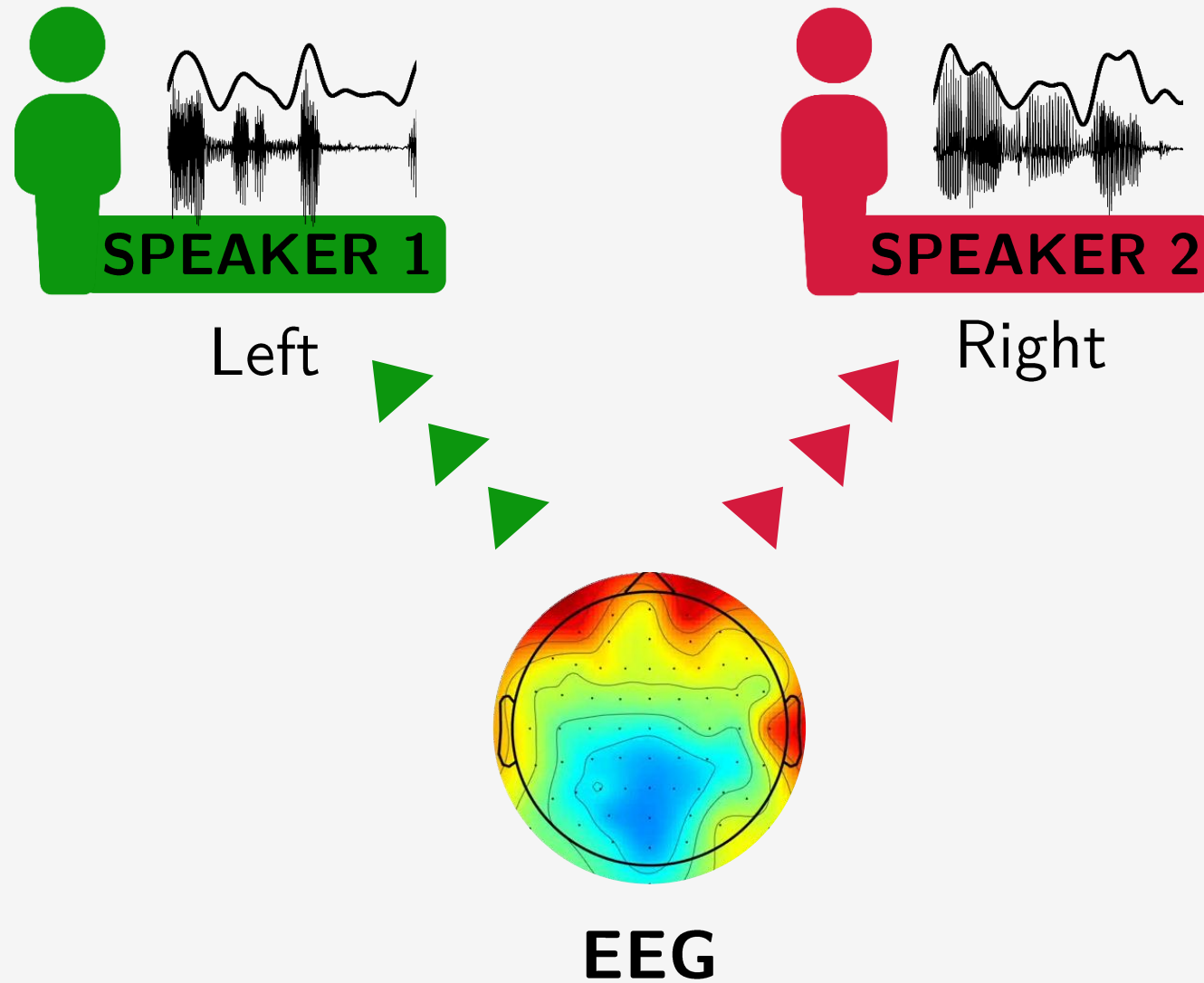
Reconstruction



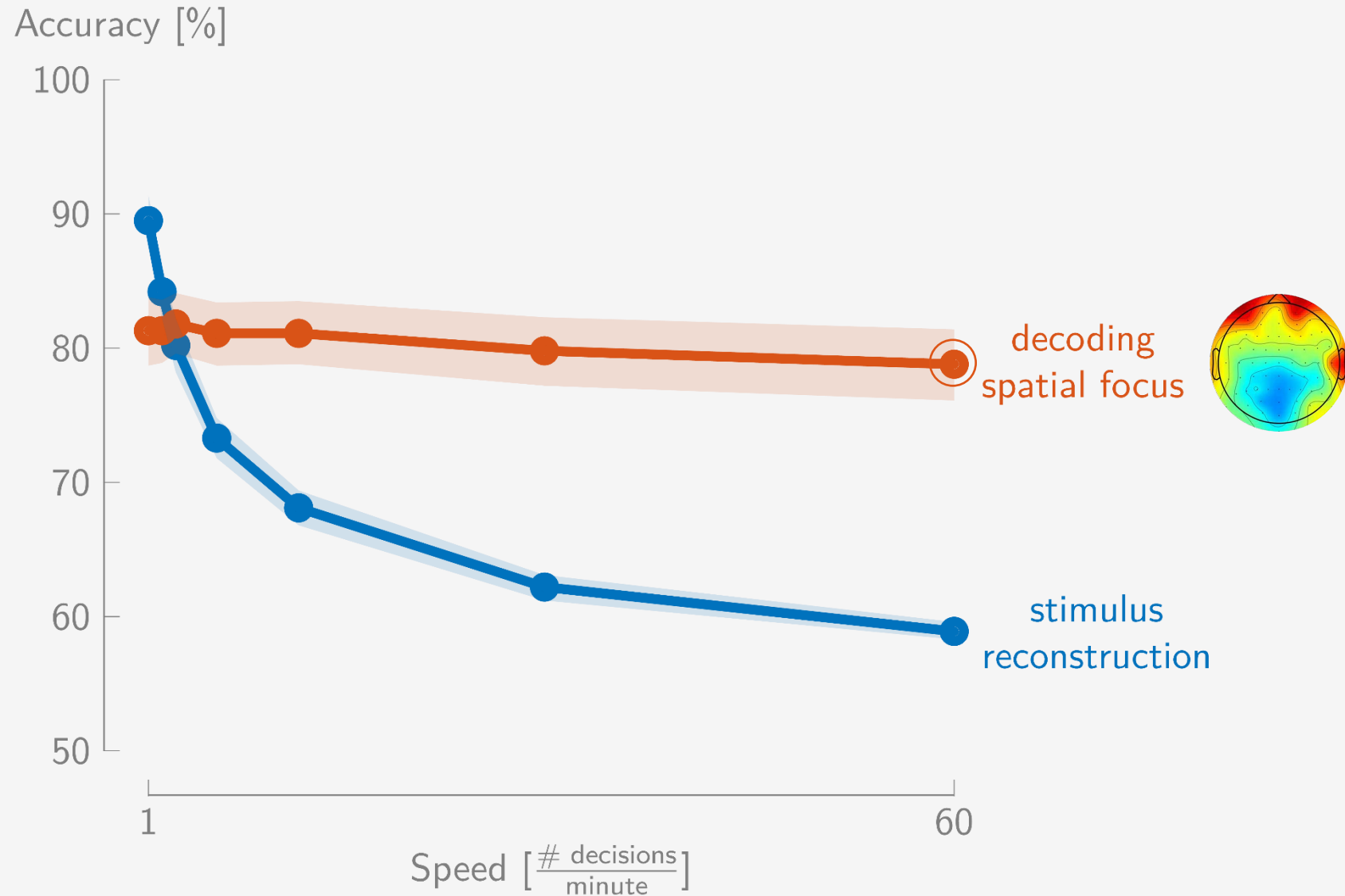
Stimulus reconstruction performs too inaccurate at high speeds



Decoding the **spatial focus** of auditory attention



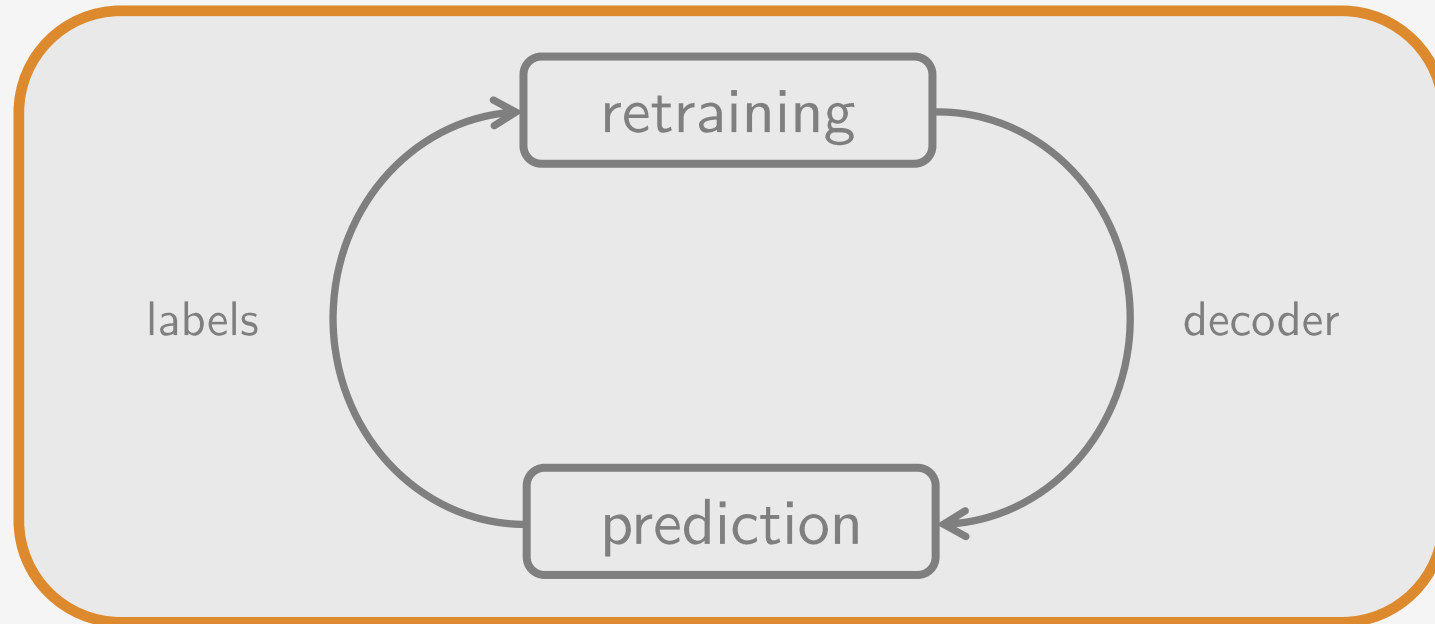
CSP drastically improves performance at high speeds

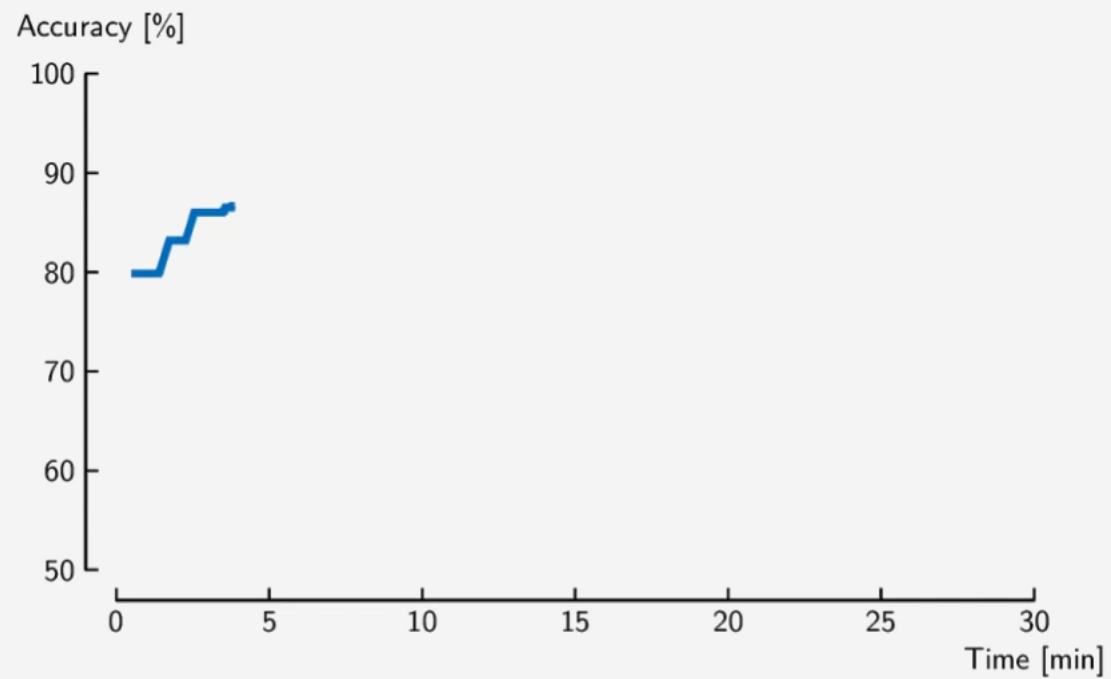


The stimulus reconstruction algorithm requires **ground-truth data** for each new user and does **not adapt** to changes

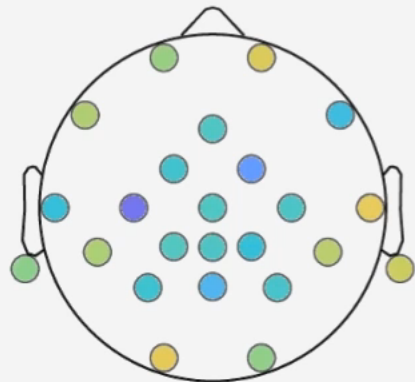
The stimulus reconstruction algorithm requires ground-truth data for each new user and does not adapt to changes

Repeat continuously over time





Fixed supervised decoder



Accuracy [%]

Day 1

Day 2

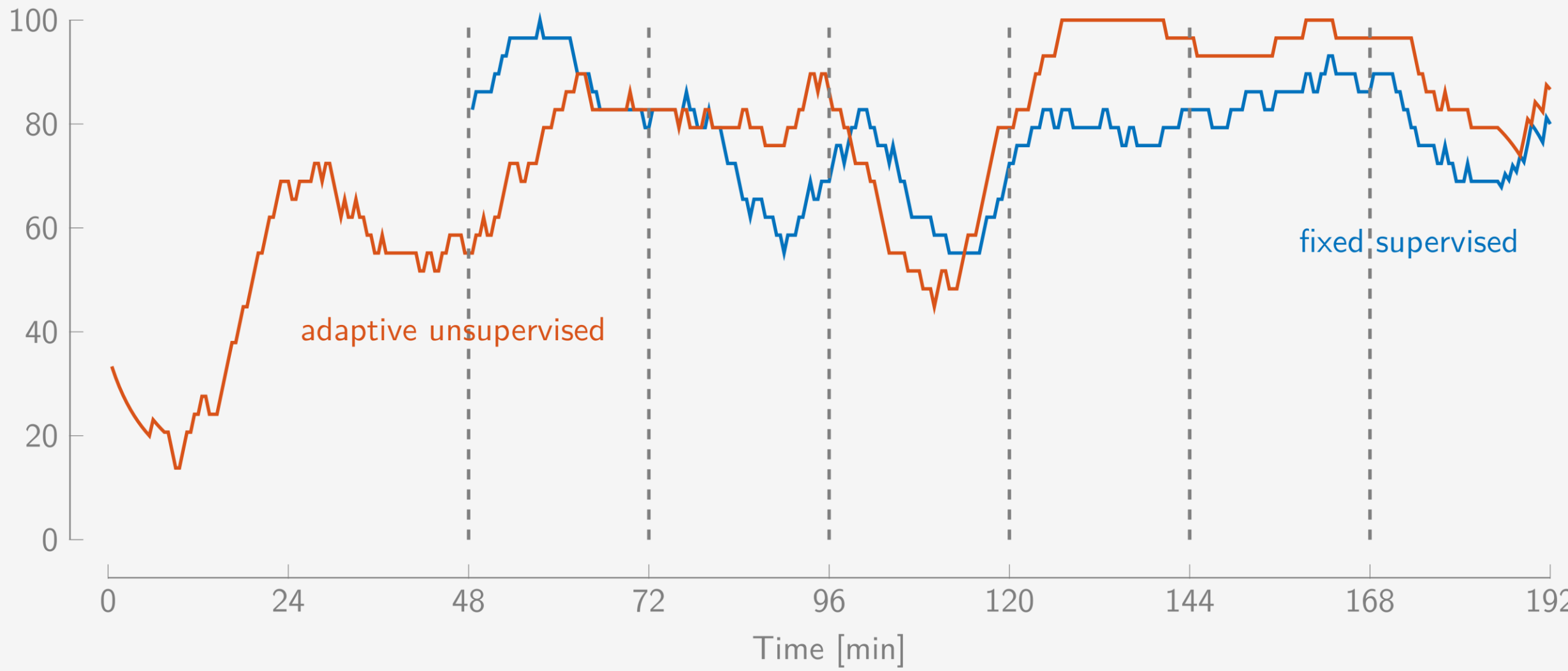
Day 3

Day 4

Day 5

Day 6

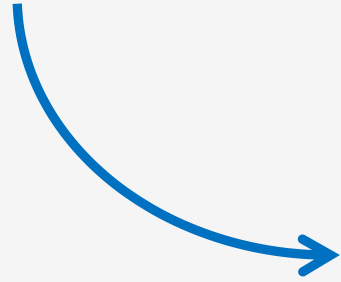
Day 7



adaptive unsupervised

fixed supervised

Auditory attention decoding for neuro-steered hearing devices



PLUG & PLAY

UNSUPERVISED

TIME-ADAPTIVE

FAST

ACCURATE