Group 2 Final Abstract

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A perceptual decision-making task involves processing sensory information, reward-based action selection and execution[1][6]. In simple Go/NoGo decision tasks, the mice may act or not act for Go stimulus (resulting in a hit or miss) and NoGo stimulus (resulting in a false alarm or correct rejection) respectively[1][3][5]. Previous studies have investigated the behavioral strategies adopted by mice on such decision-making tasks[1]. Here, we have analysed the Allen Ophys Dataset [1][2] to study neural activities, behavioral patterns, and task outcomes associated with reward reception of mice performing a visual stimulus discrimination task.

Building upon previous work [1], we predict task performance success rate of mice in familiar and novel sessions depending on the choice or mixture of adopted strategies, and compare weightage of strategies in the different sessions. We also check the neural activity in the excitatory, Vip and Sst cell populations and correlate with the choice of dominant strategies. We also investigate whether certain mice had preference for certain strategies.

We also explore the drop in motivation of mice in active sessions as time progresses [5] by studying the performance rate and latency/reaction time to image changes, and connect to evolution of strategy choice.

Finally, we also explore the population coding of neurons through sensory, behavior and task variables, and provide a descriptive analysis of neurons’ mixed selectivity[5][6][7].

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