

Introduction

The development of one's experiences is a common occurrence when one is moving around in their environment as these representations enable one to record this data to then recall what happened, where, and why. We analyzed behavior data recorded from animals in order to investigate place cell activities in the hippocampus.

- Navigation in dynamic, novel environments
- Free exploration

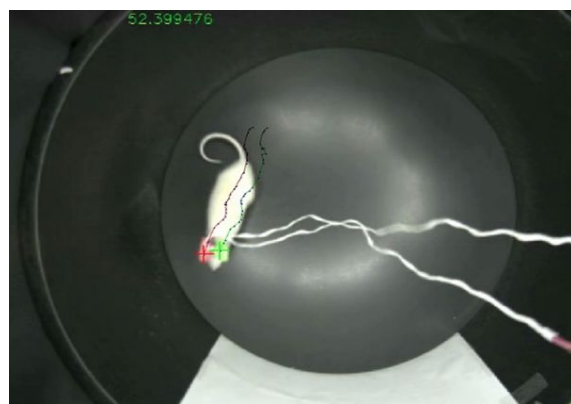


This is all in order to establish what forms of brain activity could be observed which would provide evidence for brain mechanisms of memory formation and spatial processing.

Methods

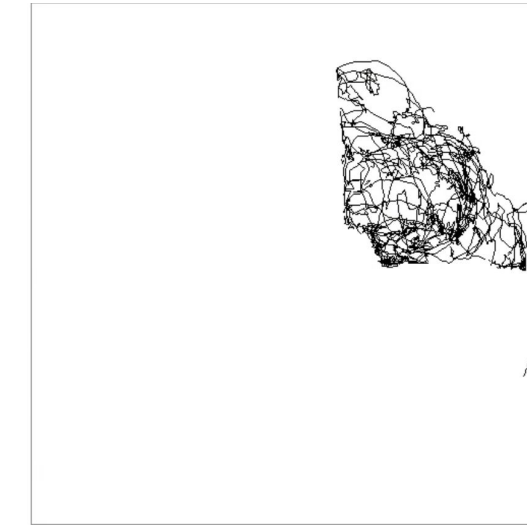
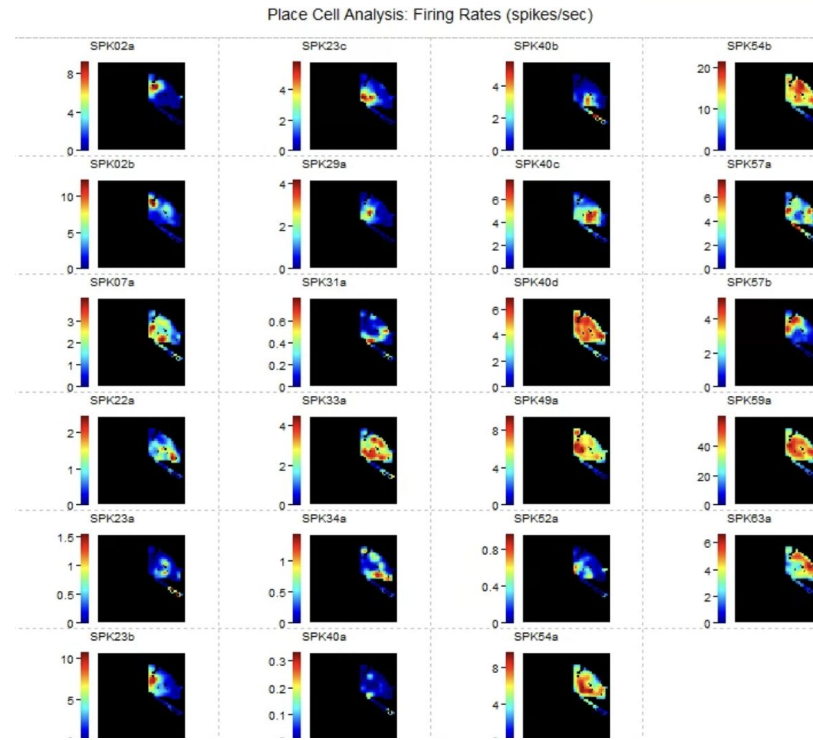


Here is the maze the rat navigates

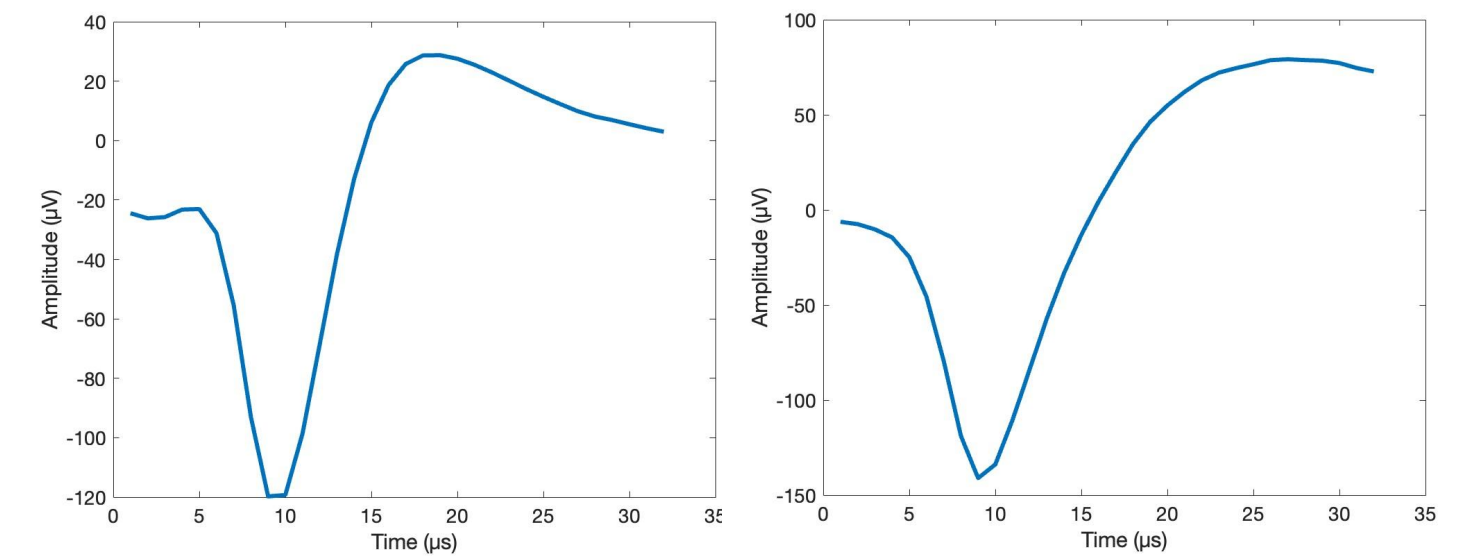
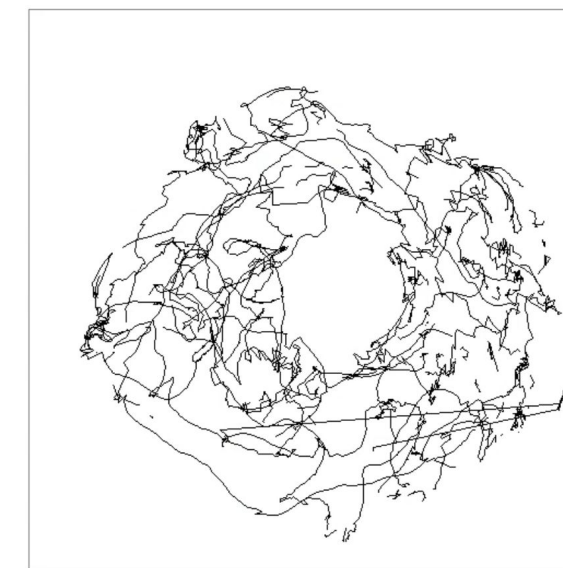
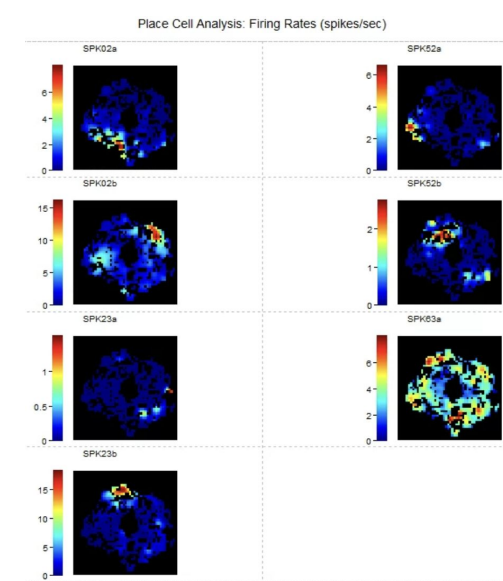


- An electrode is implanted into the rat's brain (hippocampus)
- The rat is introduced to the first section of the maze
- After 5 minutes, the rat is introduced to different sections of the enclosure gradually
- The walls of the enclosure all have different designs in order to provide visual input to the rat
- The rat is lured around the enclosure with food

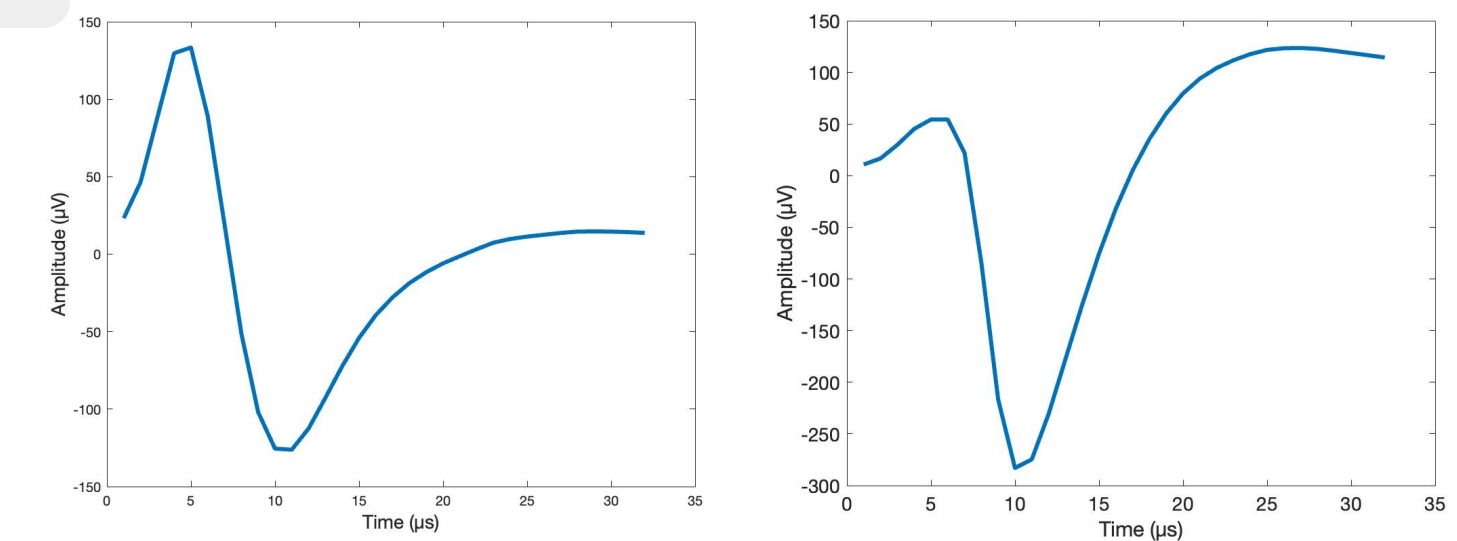
Results



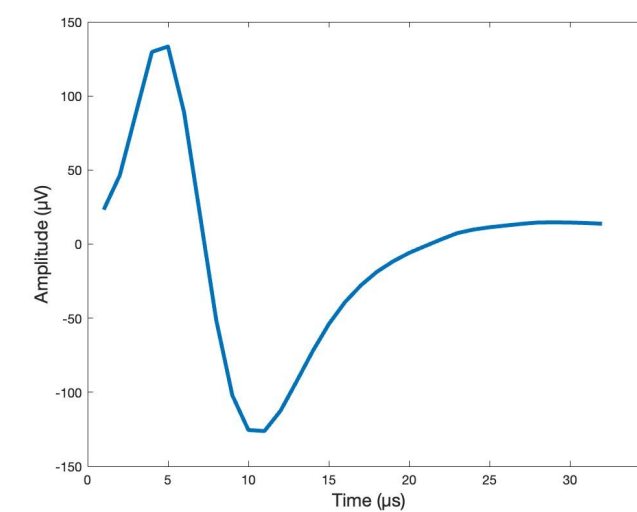
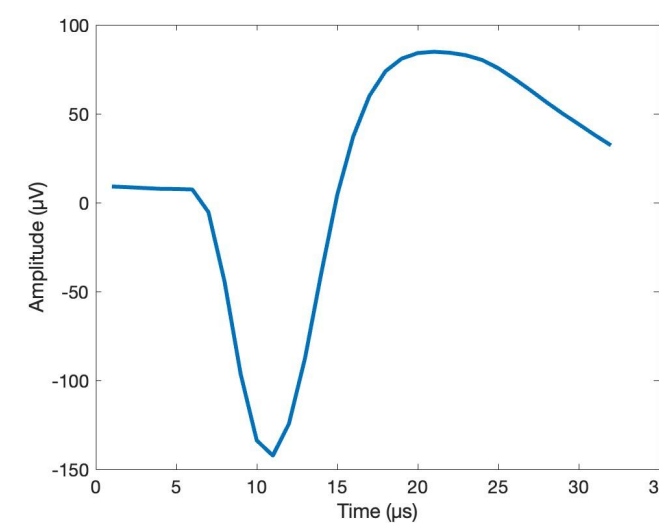
This area is section one of the enclosure; we are able to see the rat's path. (pictured right) We also see the firing rates. (pictured on top) Its path and firing rates are pictured below.



Here we see different neural spikes



Conclusion



The rats' hippocampus has been observed to produce different activity when exposed to novel environments. Through correlate the rats' neural activities with its' location, we are able to investigate how the hippocampus process novel spatial information.

Future Work

- Navigation in dynamic, virtual reality environments

