

Instance Segmentation to Identify Mouse Brain Cell Types

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Introduction

For the study of brain function and behavior, the mouse brain serves as a valuable model system.

Methods to accurately analyze the complex signals produced by the mouse brain are becoming increasingly important due to developments in neuroimaging and optogenetics. This interdisciplinary project explores instance segmentation with fluorescence microscopy images of mouse brain tissue.

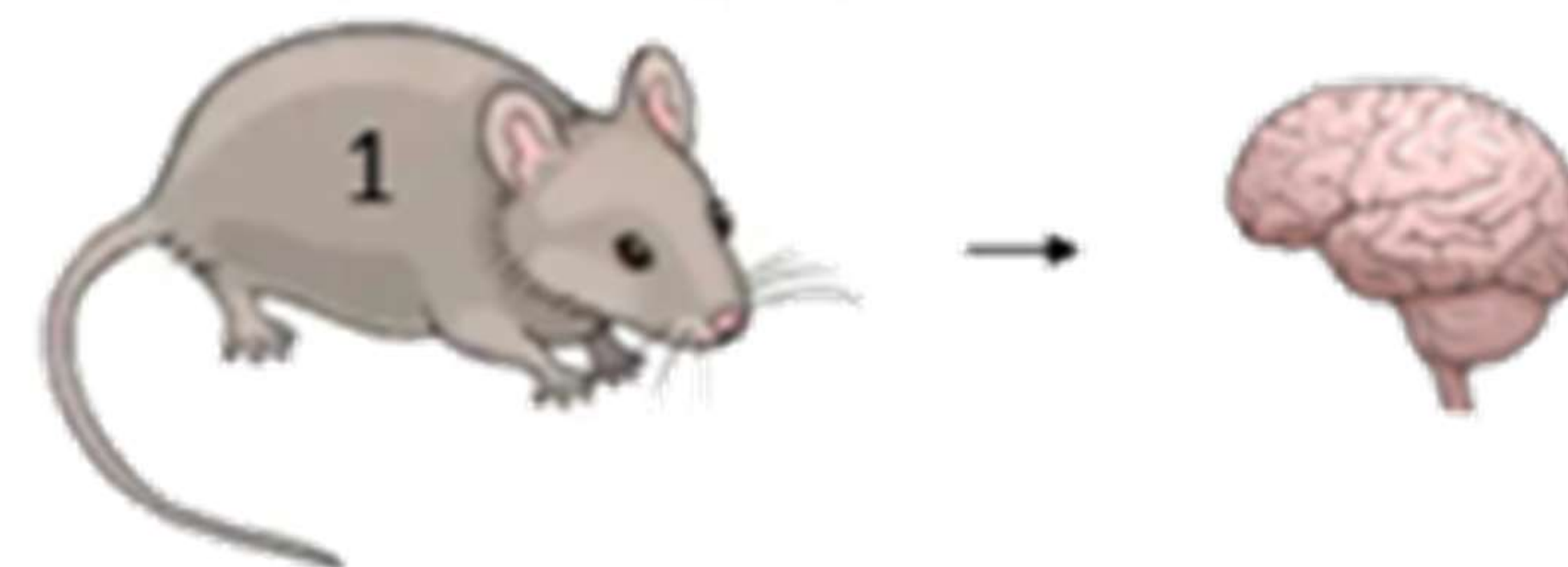
Research Questions

To understand the complexity of the tissue

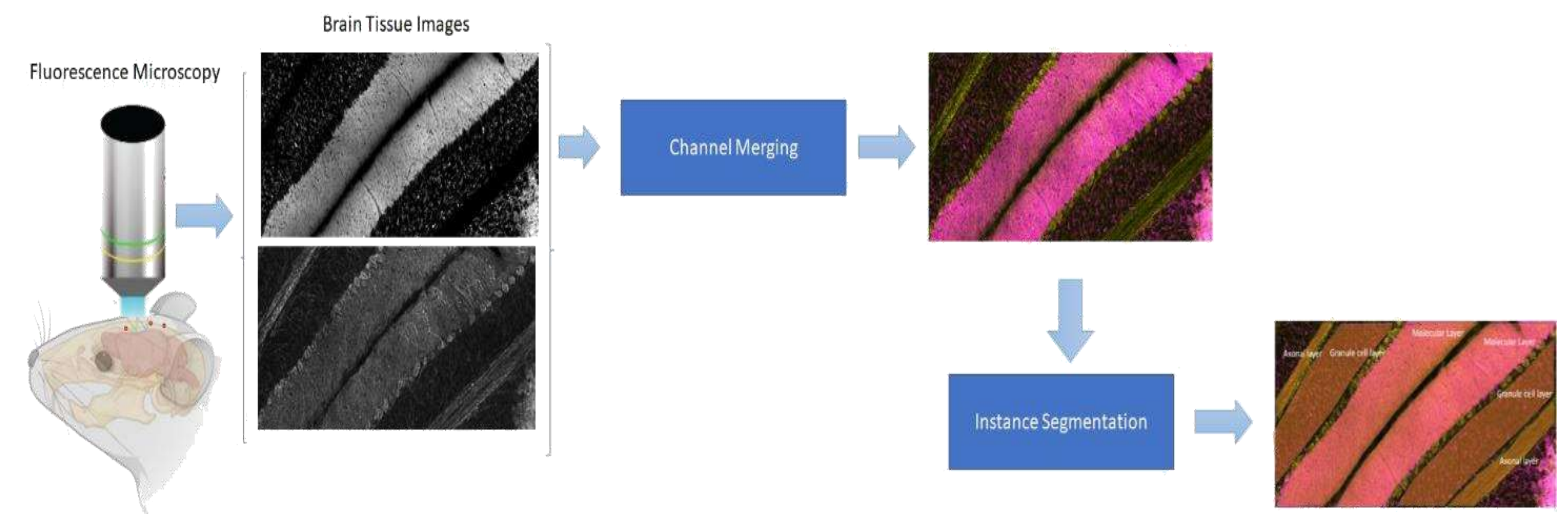
How can we handle the imaging artifacts and the data size and quality?

Data Collection

We collect the images of mouse brain tissue from Sathyanesan lab.



Proposed Framework



Instance segmentation aims to output each pixel's object class or instance is specified by a mask or matrix with numerous elements. For the preprocessing step, several pertinent heuristics, or high-level image attributes, will be applied. We will increase the brightness and enhance the contrast. Then, the channel merging is applied to combine the inputs from different channels. This final image will be fed into the Instance Segmentation Transformer (ISTR) framework.

