MACQUARIE University

DEEPSLICE: A.I. solution for registration of mouse brain images

BACKGROUND

The mouse is the dominant model organism in contemporary neuroscience research. Standardised models of the mouse brain, featuring ~900 distinct structures, have been developed to unify anatomical taxonomy across the field. However, the registration of real-world histological images to the standardised brain model remains challenging. This is a key step for the accurate analysis of data but is difficult and time-consuming, even for experienced researchers. We have developed a solution for this bottleneck using machine learning.
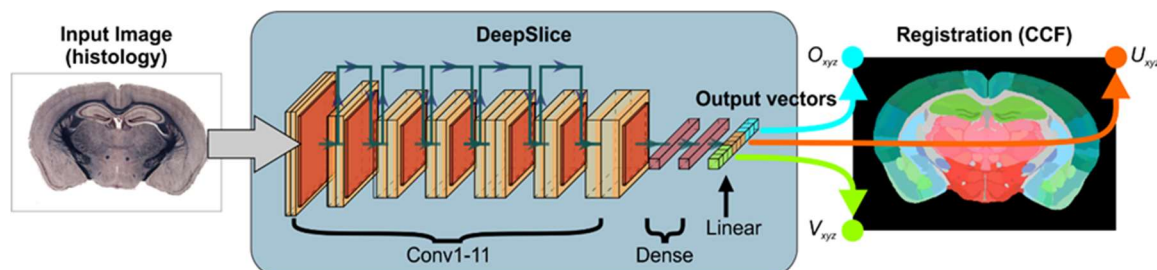
OUR SOLUTION

DeepSlice is a Convolutional Neuronal Network that has been trained to predict alignment coordinates for any coronal image of the mouse brain, permitting very rapid registration of histological images to the Allen Common Coordinate Framework. DeepSlice is robust to different staining and imaging modalities and imperfections in cutting angle, operating in milliseconds at the touch of a single button without further retraining.

STAGE OF DEVELOPMENT

A fully functional online prototype is available for use at DeepSlice.com.au. Patent pending.

APPLICATIONS

- ✓ Add-on/ module for existing analysis software
- ✓ Integrated into software for microscope stage control

FEATURES	BENEFITS
Matches the accuracy of expert human neuroanatomists	"Set and forget" Runs on standard desktop or laptop, no additional training required
Robust to diverse staining and imaging modalities	Speed: <100 ms per image in standard desktop environment

INVENTORS

Mr Harry Carey
Assoc. Prof. Simon McMullan

PARTNERING OPPORTUNITY

Macquarie seeks a partner to licence the software technology.

WOULD YOU LIKE TO KNOW MORE?

Office of Commercialisation

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DeepSlice is trained to predict Output Vectors, corresponding to Allen Mouse Brain Atlas coordinates, from coronal histological images prepared using any staining or imaging technique.

mq.edu.au/commercialisation