

Introducing CSHL Team

Team:

Partha P Mitra (CSHL) <http://mouse.brainarchitecture.org>

Adam Kepecs (CSHL) <http://kepecslab.cshl.edu/>

TBD Postdoc (CSHL)

James Crawford (Northwell) <http://www.feinsteininstitute.org/our-researchers/james-m-crawford-md-phd/>

TBD Pathology resident (Northwell)

Also: In collaboration with IIT Madras team also on this wiki

Objectives:

An important emphasis of modern machine learning is to discover “implicit knowledge” from labeled examples or via reinforcement learning. In the case of automating pathology diagnoses, which is the context of this study, the implicit knowledge in question is embedded in the pathologist, and includes the capabilities of the visual system, skilled judgment of microscopic histopathology images. and background biomedical knowledge.

One of our objectives is to examine this implicit knowledge by psychophysical experiments in which the participants are skilled pathologists judging histopathological sections under a microscope. These judgments will be compared to the performance of machine learning algorithms trained to mimic the performance of the pathologists but acting on co-registered whole slide image data.

By comparing and contrasting the performance of the pathologists with the performance of the algorithms we hope to gain two way insight: better understanding of the pathologist’s implicit knowledge, and better understanding of the architecture of the learning networks in comparison.

The study will be carried out as a collaboration between the groups of Dr Mitra (high throughput neurohistology; machine learning), Dr Kepecs (neurobiology of decision making) and Dr Crawford (clinical histopathology). We plan to set up the eeDAP apparatus in accordance with the instructions provided, assuming we are able to secure the appropriate internal funding. Pathologists from Northwell will serve as subjects of the study.

We will coordinate with the IIT Madras team which is also setting up an eeDAP study. The study will make use of the computational framework and web UIs created by the IIT Madras team working collaboratively with Dr Mitra on whole mouse brain neurohistological data sets as part of

INTRODUCING CSHL TEAM

the Mouse Brain Architecture Project.
