MICCAI 2014 Grand Challenges

Summary

MICCAI 2014 will provide an excellent opportunity for a day long cluster of events in brain tumor computation (September 14, 2014). It will be composed of a workshop and radiologic and pathology image processing challenges that discuss and showcase the value of open science in addressing some of the challenges of Big Data in the context of brain cancer.

1. **Workshop: Computational Precision Medicine**
2. **Imaging Challenge: BRATS 2014**
3. **Digital Pathology Challenge**

Source of Test Data: All cases selected for the Test phase of each challenge will be drawn from the Cancer Genome Atlas (TCGA).

Questions about the workshop and challenges? Send email to: **farahani@nih.gov**

Workshop: Computational Precision Medicine

The goal of the workshop is to present and discuss basic requirements and current resources for open science development of systems in support of computational precision medicine in brain tumor diagnosis and treatment planning. This half-day workshop (8:00 am – 12:00 pm) will include invited talks and panel discussion. Topics of interest include integration of Big Data, including imaging, 'omics', and other laboratory and clinical data, cloud-based computing, open archives, open science, validation and bench marking of algorithms in support of precision medicine. Proffered abstracts for poster presentations will be considered.

Workshop and challenges will be held in room 216 at the Joseph B. Martin Conference Center at Harvard Medical School (HMS), 77 Avenue Louis Pasteur, Boston, MA. If you have not already registered for the event you will need to register at the MICCAI main venue, Kresge Auditorium at MIT first. Shuttles will run between this location and the Martin Conference Center at HMS in the morning (departing at 7:00am and at 7:30am) and in the evening (departing at 5:15pm). Alternatively, you can use public transportation or taxi.

More information about the morning workshop can be found on this page.

Imaging Challenge: BRATS 2014

The goal of the imaging Challenge in multi-modal Brain Tumor Image Segmentation (BRATS) is to gauge the current state-of-the-art in automated brain tumor segmentation and compare different methods. In addition, BRATS 2014 will include sub-challenges on analysis of longitudinal data sets and classification of tumor grades. BRATS-2014 Challenge will contain three sub-challenges:

Sub-Challenge 1: Segmentation – Automatic Evaluation of a collection of over 50 multi-parametric MRI cases.

Sub-Challenge 2: Longitudinal Evaluation – Segmentation of time series images.

Sub-Challenge 3: Classification – Automatic classification into one of the three classes of Low Grade II, Low Grade III, and High Grade IV (glioblastoma multiforme or GBM).

For more information please visit: http://www.braintumorsegmentation.org and https://www.smir.ch/BRATS/Start2014.

Brain Tumor Digital Pathology Challenge

As the technology for digital imaging has advanced, there is now increasing use of digital images ("virtual slides") for pathologic analysis of surgical specimens. Automated tumor segmentation, by defining tumor regions with critical histologic features has the potential to increase both the speed and accuracy of diagnosis by pathologists and/or computer software. There will be two sub-challenges in the proposed Brain Tumor Digital Pathology Challenge:

Sub-Challenge 1: Classification - Automated classification of LGG and GBM from a collection of 30+ high-resolution digital pathology slides.

Sub-Challenge 2: Segmentation – Automated segmentation of necrotic and normal brain regions on regions of digital pathology slides from a collection of 20+ GBM cases.

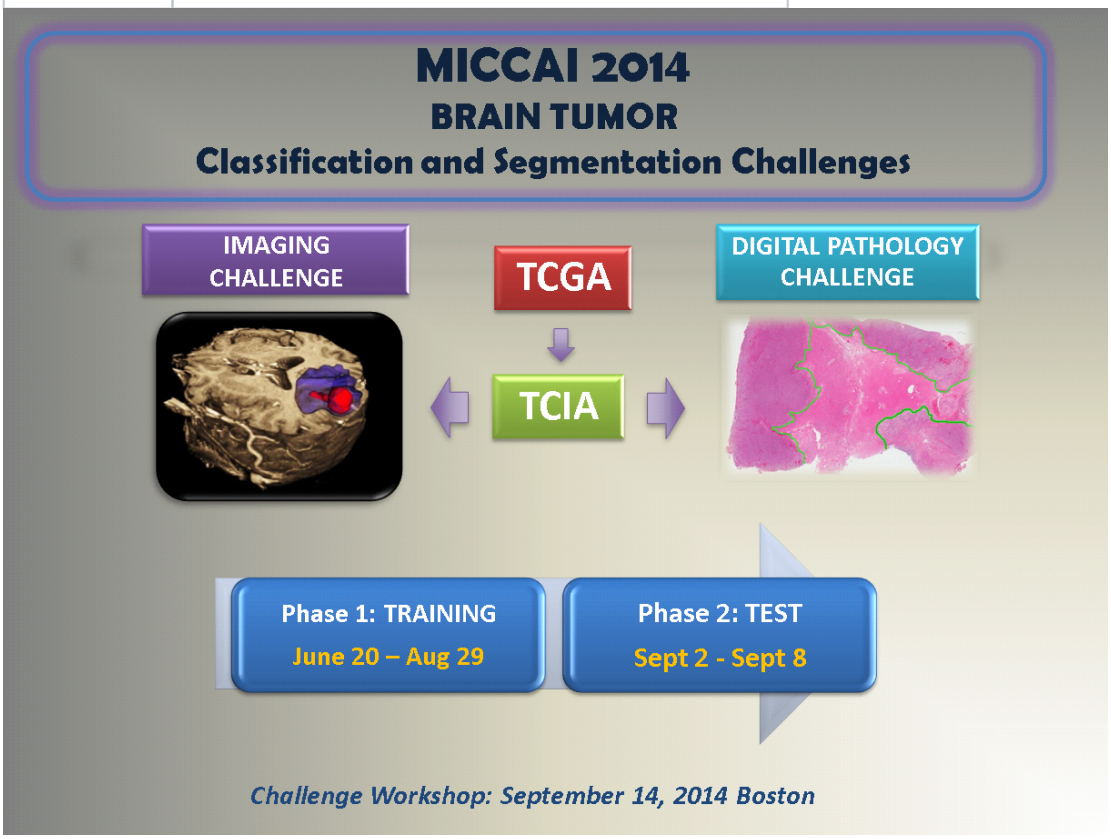
For more information please visit: http://pais.bmi.stonybrookmedicine.edu

Manuscript and Poster Submissions

Participants in Brain Tumor Challenges will be required to submit short manuscripts outlining their approach and preliminary results on the training data by **July 25**. Respective Challenge organizers will review all submissions and notify the corresponding authors. Challenge Test (Phase 2) results will be announced at the workshop and the top three scoring teams will be invited to give 10 min presentations of their methodology and results. **All manuscript submitters are invited to bring posters describing their methodology and results for display during the September 14 meeting at MICCAI. The maximum size of the poster allowed is 48 in x 48 in (or 120 cm x 120 cm)**. Reports may be prepared by the respective organizers of each Challenge after MICCAI 2014 for submission to appropriate peer reviewed journals.

Timeline

June 20	Brain Tumor Challenges: Phase 1 - Training Data Released
June 20 - Aug 29	Training Phase
July 25	Abstracts for the morning workshop and manuscripts for challenges due
Sept 2	Brain Tumor Challenges: Phase 2 - Test Data Released
Sept 2 - Sept 8	Test Phase
Sept 14.	Brain Tumor Workshop and Challenges at MICCAI (Boston, MA)



Organizers & Major Contributors

- Daniel J. Brat, Emory University
- Larry Clarke, National Cancer Institute
- James Davis, Stony Brook Cancer Center
- Keyvan Farahani, National Cancer Institute
- John Freymann, Leidos Biomedical Res, Inc.
- Carl Jaffe, Boston University
- Jayashree Kalpathy-Cramer, MGH Harvard
- Justin Kirby, Leidos Biomedical Res., Inc.
- Tahsin Kurc, Stony Brook Cancer Center
- Bjoern Menze, TU Munich, INRIA Sophia-Antipolis
- Miguel Ossandon, National Cancer Institute
- Mauricio Reyes, University of Bern
- Joel Saltz, Stony Brook Cancer Center