



General Schedule

Day 1: Thursday, October 3

- 8:30 Welcome and Opening Remarks
Metin Akay, IEEE Brain Chair, University of Houston
Esra Tasali, Workshop Co-Chair, University of Chicago
- 8:40 **Plenary Keynote: Dr. Alex Leow, Professor of Psychiatry and Bioengineering, University of Illinois, Chicago**

Session 1: Emerging Neurotechnologies

- 9:15 **Keynote: John Rogers, Northwestern University, USA**
Soft Bioelectronic Systems as Neural Interfaces
- 10:00 **Keith Mathieson, University of Strathclyde, UK**
MicroLED devices for optical manipulation of neural circuits
- 10:20 **Maysam Chamanzar, Carnegie Mellon University, USA**
High throughput Multiplexed Electro-optic Neural Recording
- 10:40 **Break**
- 11:00 **Jian-Ping Wang, University of Minnesota, USA**
Magnetism and Spintronics in Brain Research and Biomedical Applications
- 11:20 **Yao-Hung Liu, IMEC, The Netherlands**
Retina-inspired Compressive Telemetry for Implantable Brain-Computer Interfaces
- 11:40 Symposium 1 Speakers Panel Discussion
- 12:15 **IEEE Brain Neuroethics Presentation**
Laura Cabrera, Pennsylvania State University and Dr. Rebecca Monteleone, Toledo University
- 12:45 IEEE Brain Neuroethics World Cafe Feedback Session (concurrent with lunch break)
- 12:45 **Lunch Break (lunch provided)**

Session 2: Machine Learning and Computer Paradigms for Brain Discovery

- 2:00 **Keynote: Christos Davatzikos, University of Pennsylvania, USA**
Machine Learning and Neuroimaging: Contributions to Understanding Heterogeneity of Neurodegenerative and Neuropsychiatric Diseases and to Precision Diagnostics
- 2:45 **Laleh Najafizadeh, Rutgers University, USA**
Data-Driven Computational Approaches for Uncovering the Dynamics of Brain Function
- 3:05 **Mahfuzar Rahman, Georgia State University, USA**
Explainable AI for Brain Discovery: Advances, Challenges, and Future Directions
- 3:25 **Break**
- 3:45 **Malte Hoffmann, MGH Harvard Medical School, USA**
Synthesis-driven Machine Learning for Neuroimage Analysis
- 4:05 **Brad Aimone, Sandia National Labs, USA**
From New Neurons to New Chips: How Neuromorphic Computing Can Help Us Understand the Brain
- 4:25 Symposium 2 Speakers Panel Discussion
- 5:00 Poster Session Introductions: Lightning Talks
- 5:30 Poster Session and Reception
- 7:00 *Day 1 Workshop concludes*

Day 2: Friday, October 4

- 8:30 Welcome
Metin Akay, IEEE Brain Chair, University of Houston
Selin Aviyente, Workshop Co-Chair, Michigan State University
- 8:40 **Plenary Keynote: Dr. Amy Kruse, General Partner and Chief Investment Officer, Satori Neuro**

Session 1: Clinical Applications and Impact

- 9:15 **Keynote: Jose Pons, Shirley Ryan Ability Lab, USA**
- 10:00 **Padma Sundaram, Harvard Medical School, USA**
Multimodal Approaches to Study Cerebellar Electrophysiology
- 10:20 **Zhi-De Deng, NIH (NIMH), USA**
A Model-Driven Approach to Personalized Neuromodulation Treatment
- 10:40 **Break**
- 11:00 **Sudhin Shah, Cornell University, USA**
Objective Neurophysiological Markers of Cognitive Recovery following Pediatric Brain Injury
- 11:20 **Vesna Sossi, University of British Columbia, Canada**
High Resolution PET Brain Imaging: New Frontiers
- 11:40 Symposium 3 Speakers Panel Discussion
- 12:15 Live Demonstration / Poster Introductions: Lightning Talks
- 12:45 Live Demonstrations / Poster Session (concurrent with lunch)
- 12:45 **Lunch Break (lunch provided)**
- 1:45 *Get Involved with IEEE Brain: Students and Young Professionals Meeting, lobby*

2:15 **Technology Transfer and Funding Panel**

Amy Kruse, General Partner and Chief Investment Officer, Satori Neuro

Asli Aras, Vice President and Head of Corporate Development, RTI International

Bradford Casey, Michael J. Fox Foundation

Svetlana Kurilova, Associate Technology Manager, Office of Technology Management, UIC

Phillip Troyk, Executive Director, Pritzker Institute of Biomedical Science and Engineering,
Illinois Institute of Technology

4:00 **Light Reception**

4:45 Awards and Closing Remarks

5:30 *Day 2 Workshop concludes*

Poster and Live Demonstration Schedule

Day 1: Thursday, October 3

Emerging Neurotechnologies Posters

1. **Title:** Ferritin-assisted electron transport in catecholaminergic neurons
Presenting Author: Christopher Rourk
2. **Title:** MRI-visible Superparamagnetic Ultraflexible Electrodes for Precision Electrophysiology
Presenting Author: Eminhan Ozil
3. **Title:** Brainwave authentication
Presenting Author: Violeta Tulceanu
4. **Title:** Pixel-wise programmability enables dynamic high-SNR cameras for voltage imaging and high-speed microscopy
Presenting Author: Jie Jack Zhang
5. **Title:** An Energy Efficient Wireless Powered Neural Stimulator Achieving 5.5-27.7x Improved Stimulation Efficacy
Presenting Author: Siddharth Agarwal
6. **Title:** Uncovering neural dynamics of reach perturbations induced by cortical optogenetic inhibition using a large-scale optogenetic interface in non human primates
Presenting Author: Noah Stanis
7. **Title:** Galvanic Body-Coupled Powering for Injectable Wireless Stimulating Implants
Presenting Author: Adam Khalifa
8. **Title:** Integration of an implantable imaging device and microfluidics technique for localized drug delivery
Presenting Author: Yoshinori Sunaga
9. **Title:** Dynamics of Focally Hyperconcentrated, Ultrasound-Triggered Drug Release for Non-Invasive Neural Circuit Manipulation
Presenting Author: Gizem Aydemir

Machine Learning and Computer Paradigms for Brain Discovery Posters

10. **Title:** Decoding Spatiotemporal Processing of Speech and Melody in the Brain
Presenting Author: Akanksha Gupta
11. **Title:** Community Detection in Signed Multiplex Functional Brain Networks
Presenting Author: Sema Athamnah
12. **Title:** Decoding representations of sleep spindles associated with odor-cueing of declarative memories using spatial and temporal blocks of deep convolutional filters
Presenting Author: Pankaj Pandey

13. **Title:** GlassDBN: Learning Point-to-point Network Connectivity from fMRI
Presenting Author: Pavel Popov
14. **Title:** An MLP that Could: Learning fMRI without Learning Dynamics
Presenting Author: Pavel Popov
15. **Title:** An Analysis on the Feasibility and Acceptability of a Mindful-Based Virtual Reality Program to Promote Mental Health in College Students
Presenting Author: Sunghan Kim
16. **Title:** Prediction of Motor Responses to Transcranial Magnetic Stimulation using a Deep Neural Network informed by Neuroanatomy, and Functional and Effective Connectivity
Presenting Author: Mahdi Paslar
17. **Title:** ChatBCI: A Fast P300 Speller Brain Computer Interface Incorporating Generative AI-Based Word Prediction
Presenting Author: Jiazhen Hong
18. **Title:** Mitigating Pain Interference in BCIs: A Neural Machine Translation-Based Strategy
Presenting Author: Ashwini Subramanian
19. **Title:** PoserDeep Isolation Forest Outlier Analysis of Large Multimodal Adolescent Neuroimaging Data
Presenting Author: Eric Silberman
20. **Title:** Combining motor and auditory ERP based BCI to improve Prolonged Disorders of Consciousness (PDoC) assessment
Presenting Author: Naomi DuBois
21. **Title:** Quantitative Study of Insertion Mechanical Properties of Implantable Neural Probes
Presenting Author: Zebin Jiang
22. **Title:** A Hybrid Machine Learning Algorithm for Predicting Resting Motor Thresholds in Patients with Schizophrenia and Healthy Individuals Undergoing Transcranial Magnetic Stimulation
Presenting Author: Akshita Ramesh
23. **Title:** Using Machine Learning on Functional Brain State in Brain-Computer Interfaces to Implement Multiple-Factor Authentication
Presenting Author: Akshita Ramesh

Day 2: Friday, October 4

Live Demonstrations

1. **Title:** Quantitative Assessment and Personalized Intervention of Tongue Movement after Neurological Injuries
Presenting Author: Andrea Scarpellini
2. **Title:** Teleoperation Control of Multi-Joint Systems: Piloted Potentiometer Exoskeleton Arm
Presenting Author: Paul Peretz
3. **Title:** Wirehead: Enabling Synthesis-Driven ML in Neuroimaging
Presenting Author: Mike Doan
4. **Title:** Best Practices for Advancing Neuroimaging Tools on The Edge
Presenting Author: Mike Doan
5. **Title:** BrainPrint: Innovative Head-Mounted EEG Technology for Secure Personal Identification
Presenting Author: Amber Tsao

Clinical Applications and Impact Posters

6. **Title:** Larva in the loop, utilizing Danio Rerio Larva's Optokinetic Response in a closed loop machine interface
Presenting Author: Hossein Mehrabi
7. **Title:** Analysis of stress and strain in an individualized head model during different types of impact forces
Presenting Author: Ravi Hadimani
8. **Title:** Systematic Analysis of Transcranial Magnetic Stimulation Motor Response and EEG Functional Connectivity Relationship in Mild to Moderate TBI Patients
Presenting Author: Ravi Hadimani
9. **Title:** Altered Whole-Brain Excitation-Inhibition Balance Correlates with Alzheimer's Disease Risk Factors: Female-Specific Hyperexcitation
Presenting Author: Andrew P. Burns
10. **Title:** Anxiety-Related EEG Changes in Diverse Longitudinal Perinatal Cohort
Presenting Author: Maigh Attre
11. **Title:** Glioblastoma Multiforme Sensitized by miR-329 and miR- 449b Treatments to Restore AXL and eEF2K Suppression
Presenting Author: Megan Mendieta
12. **Title:** Using a Novel Digital Go/No-Go to Dissociate Intra-subject Temporal Fluctuations in Reaction Time and Accuracy
Presenting Author: Theresa Nguyen

Emerging Neurotechnologies Posters

13. **Title:** Mapping Morphine's Antinociceptive Impact on the Ventral Tegmental Area During Nociceptive Stimulation: A Novel Microimaging Approach in a Chronic Pain M
Presenting Author: Austin Ganaway
14. **Title:** Investigating Oscillatory Patterns during Chronic Pain using Matching Pursuits
Presenting Author: Dunyan Yao
15. **Title:** Increased Food Intake Following Optogenetic Activation of Hypothalamic AgRP1 Neurons in Transgenic Zebrafish Larvae
Presenting Author: John Jutoy
16. **Title:** Transnasal electrical stimulation: a method for minimally invasive stimulation of deep brain structures
Presenting Author: Mats Forssell

Machine Learning and Computer Paradigms for Brain Discovery Posters

17. **Title:** Neuro-robotic Control Using Brain Organoid Network
Presenting Author: Omowuyi Olajide
18. **Title:** EEG-based detection of threat perception from event-Related Potentials (ERPs)
Presenting Author: Naomi du Bois