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Single Neuron Studies of the Human Brain

PROBING COGNITION

Organized by:
Moran Cerf
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Baltimore, MD
November 13-14, 2014

Schedule of Events

Day 1: (thursday 11/13/14)

8:00am Vendor setup starts
8:45am Registration (Location: Zayed 2119A in Zayed Tower) breakfast available.
9:00am Room Opens
9:15am Introductions and Welcome

Session 1: Decision Making
9.30am Sameer Sheth (Columbia): The Physiology of Human Cognitive Control: Investigations in the Dorsal Anterior Cingulate Cortex
10:00am Kareem Zaghoul (NIH): Single unit activity in the human subthalamic nucleus during decision making
10:30am Ziv Williams (MGH/Harvard): Prefrontal recordings in relation to cognitive control

11:00am Break

11:15am Keynote 1: Larry Squire (UCSD), The medial temporal lobe, spatial navigation, and spatial cognition

Session 2: Recognition, Faces
12.00pm Katalin Gothard (U Arizona): Naturalistic social stimuli elicit eye-selective neural responses in the monkey amygdala
12.30pm Moran Cerf (Northwestern): Single neuron correlates of content learning in natural stimuli

1:00pm Lunch (provided)

2:00pm Flash poster presentations (4 presenters)

- Shaun Patel (MGH),
  Rapid Intermittent Deep Brain Stimulation Biases Behavior in Financial Decision-Making Task
- Juri Minxha (Caltech),
  Fixation-Aligned Single Cell Responses in Human and non-Human Primate Amygdala
- Taufik Valiante (U Toronto),
  Laminar specific specialization in regular spiking neurons in superficial and deep cortical laminae of human cortex maintained in vitro
- Aibel-Weiss (UCLA),
  Searching for synchrony: a microelectrode study of neuronal spike firing during human seizures

2:20pm Posters (including Break)

Session 3: Clinical neuroscience (Epilepsy, Seizures, DBS)
4:00pm Catherine Schevon (Columbia): Unraveling the electrophysiology of human seizures
4:30pm Nathan Crone (Hopkins): Neural population dynamics in human cortical function
5:00pm Stan Anderson (Hopkins): Clinical and therapeutic implications of cortical neural network modeling
5:30pm Helen Mayberg (Emory): Therapeutic Modulation of Cingulate-Cortical Oscillations in Major Depression: Groundwork for next-generation closed-loop technologies

6:00pm: End of official program day 1

Schedule of Events

Day 2: (Friday 11/14/14: Room: Hurd Hall in Nelsen/Harvey - note different location than first day)

8.45am Registration opens; breakfast available
9:00am Room opens
9:00am Welcome

Session 4: Memory I
9.15am Elizabeth Buffalo (Seattle): Neural activity related to visual exploration and navigation in primates
9.45am Ueli Rutishauser (Cedars-Sinai/Caltech): Neural population dynamics during declarative memory retrieval
10.15am Keynote 2: Itzhak Fried (UCLA)

11.00am Break

Session 5: Memory II
11.15am John Wixted (UCSD): Sparse and Distributed Coding of Episodic Memory in Neurons of the Human Hippocampus
11.45am Florian Mormann (Bonn): Single unit activity during perception and memory in the human medial temporal lobe
12.15pm Andreas Schulze-Bonhage (Freiburg) and Michael Kahana (U Penn): The spatial context of retrieved memories is reflected by neural activity in the human hippocampal formation

12.45pm Lunch (provided; and posters up)

Session 5: Memory II (continued)
1:45pm Josh Jacobs (Drexel): Entorhinal neuronal representations in human spatial navigation

Session 6: Neural prosthesis
2:15pm Richard Andersen (Caltech), Decoding motor imagery from the posterior parietal cortex of a tetraplegic human
2:45pm Carlos Varagas-Irwin (Brown), Exploring the neural representation of Attempted, Imagined, and Observed actions in human motor cortex using Spike train similarity analysis
3:15pm Technology presentation (Designated by primary sponsor – Neuralynx)

3:30pm Break

Session 7: Special topics
3.45pm Josef Parvizi (Stanford): Intracranial EEG and Electrical Brain Stimulation
4.15pm Ed Lein and Jonathan Ting (Allen Institute), Multimodal interrogation of the cellular and local circuit architecture of the human neocortex
5.00pm Dion Khodagholy (NYU), NeuroGrid: Recording action potentials from the surface of the brain

5.30pm Conclusion

Aibel-Weiss S, Rojas CA, Bragin A, Fried I, Engel J, Staba R: Searching for synchrony: a microelectrode study of neuronal spike firing during human seizures.*

Bagdasaryan J, Valderrama M, Lehongre K, Navarro V, Van Quyen M: Cross-level coupling during voluntary modulation of theta oscillations.

Birch K, Mamelak A, Chung J, Rutishauser U: Sleep Staging in Epilepsy Patients Undergoing Single Unit Recordings.

Fu Z, Mamelak AN, Ross I, Chung J, Adolphs A, Rutishauser U: Response error signalling by single neurons in human anterior cingulate cortex, amygdala and supplementary motor area.*

Gelinas JN, Khodagholy D, Buzsaki G: Hippocampal interictal discharges and sleep spindles: interference with physiological consolidation?

Hill M, Weber B, Bostroem Jan, Elger C, Mormann F: Single neuron correlates of personal preference and satiation in the human amygdala.

Ison M, Quiroga Q, Fried I: Rapid encoding of new memories by single neurons in the human brain.*

Khodagholy D: Neurogrid.*

Maoz U, Mudrik L, Rutishauser U, Mamelak A, Adolphs R, Koch C: Delibrate and random decisions and the casual role of consciousness.*

Matsuo, T: Decoding phonation from unit firing pattern and high gamma activity in frontal face-motor cortex.

Minxha1 J, Mosher CP, Mamelak AN, Gothard KM, Adolphs R, and Rutishauser U: Fixation-Aligned Single Cell Responses in Human and non-Human Primate Amygdala*

Mukamel R: tbd

Nelson M, Karoui I, Rangarajan V, Pallier C, Parvizi J, Cohen L, Naccache L, Dehaene S: Constituent structure representations revealed with intracranial data.

Niediek J, Reber T, Gast H, Bostrom J, Coenen V, Elger C, Mormann F: Single-unit activity in the human medial temporal lobe during an episodic memory task and subsequent sleep.*

Patel S, Sheth S, Mian M, Bourne S, Yang J, Flaherty A, Eskandar E: Rapid Intermittent Deep Brain Stimulation Biases Behavior in Financial Decision-Making Task.*

Possel J, Self MW, Peters JC, callus S, Baaijen JC, Roelfsema PR: Imagery influences neuronal responses in human early visual cortex (V1/V2): a case study

Pearson J, Hickey P, Lad S, Platt M, Turner D: Pattern analysis of low-frequency power predicts stopping behavior in human subthalamic nucleus.

Racz A, Navratil M, Niediek J, Reber T, Karnath HO, Bostrom J, Coenen V, Elger C, Mormann F: Invariance of single unit responses in the human medial temporal lobe to image transformations in a visual object presentation task.*

Reber T, Racz A, Bostrom J, Coenen V, Elger C, Mormann F: Single Unit Activity in the Human Medial Temporal Lobe during Conscious and Unconscious Perception at Comparable Physical Stimulus Intensities.

Rojas CA: Single-unit activities during epileptic discharges in the human hippocampal formation.

Van Quyen M, Muller L, Dehghani N, Cash S, Halgren E, Hatsopoulos N, Destexhe A: High-frequency oscillations in human and monkey cortex during sleep.*

Wang L, Moradi-Chameh H, Ayatollahzadeh S, Valiante T: Laminar specific specialization in regular spiking neurons in superficial and deep cortical laminae of human cortex maintained in vitro.*

Wang S, Mamelak A, Adolphs R, Rutishauser U: Neurons in the Human Medial Temporal Lobe Encode Target Saliency during Visual Search.

* Recipient of travel award

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*Stead et al., (2010) Microseizures and the spatiotemporal scales of human partial epilepsy. Brain 133: 2789-97. Quiroga et al., (2005) Invariant visual representation by single neurons in the human brain. Nature 435:1102-1107.

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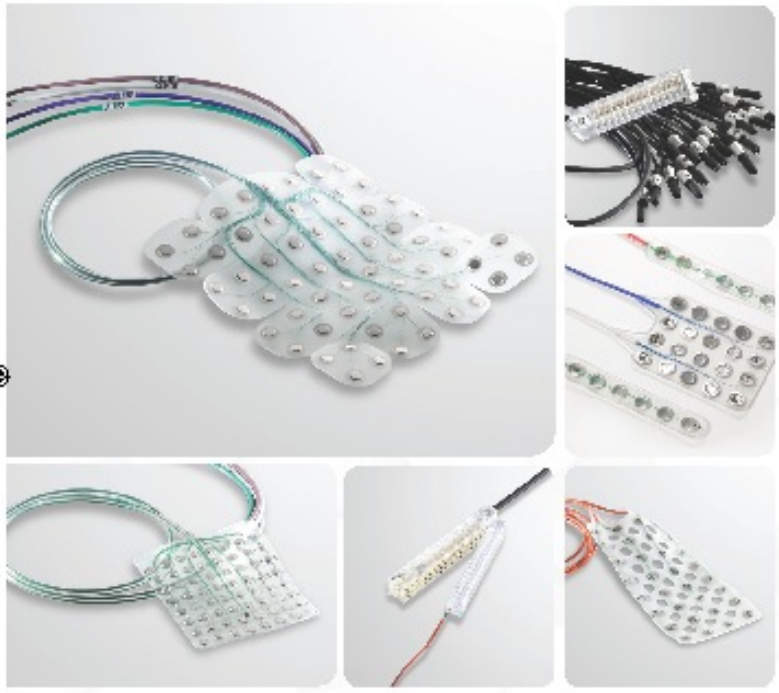

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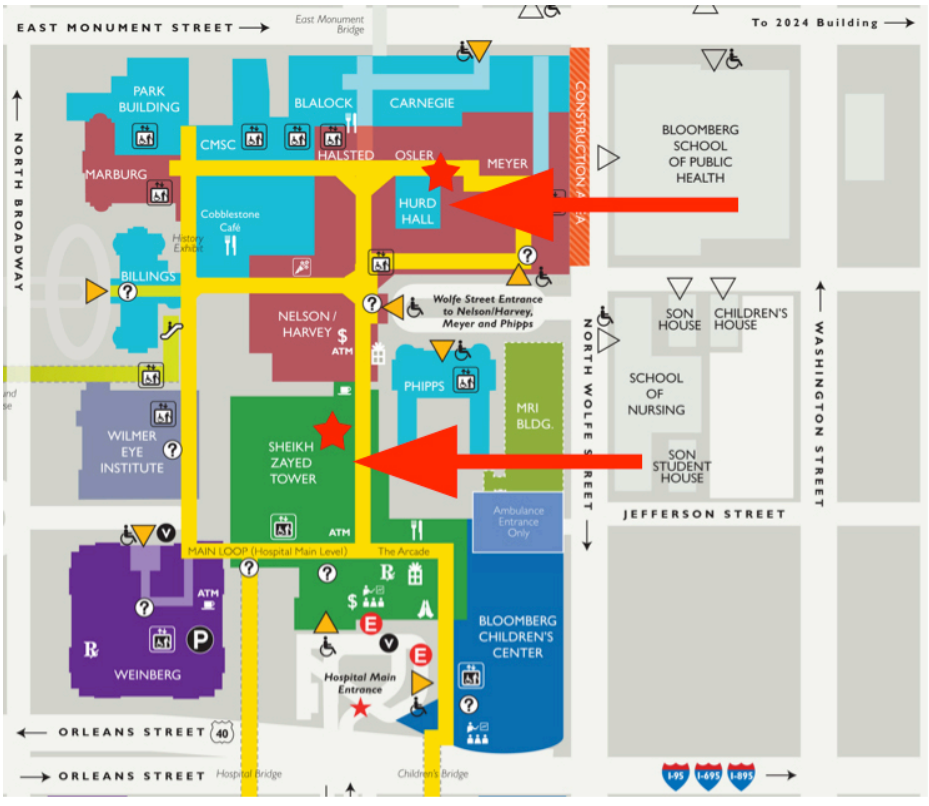

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