

VI-MSS Winter School and Conference on Computational Aspects of Neural Engineering

School: December 12-19, 2012

Conference: December 20-21, 2012

- Dec 12 Wed Day 1: Course Intro and Intro to Neuroscience
9:00-10:15am: Course Intro (Rajesh Rao)
10:30-1pm: Cellular neuroscience: neurons, spikes, synapses, plasticity (Rishikesh Narayanan)
2:00-3:30pm: Systems neuroscience: Brain regions, functional specialization (S P Arun)
3:30-5:00pm: Systems neuroscience: Motor control (Aditya Murthy)
- Dec 13 Thu Day 2: Recording, Stimulation, and Signal Processing
9:00-10:15am: Recording/Stimulation techniques: Microelectrodes, EEG, ECoG, fMRI (Supratim Ray)
10:30-noon: Signal Processing: Fourier analysis, wavelets, PCA, ICA (K. V. S. Hari)
2-5pm: Lab: Intro to EEG data, basic signal processing (Brunner and Wander)
- Dec 14 Fri Day 3: ECoG Recording and Machine Learning
9:00-10:15am: Electroencephalography (ECoG): Intro and Examples (Nitish Thakor)
10:30-noon: Regression, classification algorithms (Chiranjib Bhattacharyya)
2-5pm: Intro to machine learning and statistical inference (Chiranjib Bhattacharyya)
- Dec 15 Sat Day 4: Electroencephalographic (EEG) BCIs
9:00-noon: Intro, Principles and Survey of EEG BCIs (Peter Brunner)
2-5pm: Lab: EEG BCI2000 demos (Brunner and Wander)
- Dec 17 Mon Day 6: Electroencephalographic (ECoG) BCIs
9:00-noon: ECoG BCIs: Intro, Principles, Examples (Jeff Ojemann)
2-5pm: Lab: ECoG BCIs (Wander, Brunner)
- Dec 18 Tue Day 7: Intracortical BCIs
9am-noon: Intracortical BCIs Part I: Introduction, Principles, Examples (John Donoghue)
2-5pm: Intracortical BCIs Part II: Decoding Techniques, Examples (Wilson Truccolo)
- Dec 19 Wed: Applications, Ethics & Conclusion
9:00-noon: Applications, Ethics, Conclusion (Rajesh Rao)
End of Winter School
- 4pm: Public lecture at IISc by John Donoghue
(Title: Merging Mind and Machine: Brain Interfaces to Restore Lost Function in Humans with Paralysis)