"Event Related Potentials and Neurotherapy: In Theory and Practice"

4 Day Workshop with Prof. Jury D. Kropotov

- The goal of the workshop is to teach attendees how to improve their *diagnostic and treatment tools* by using a newly emerged technology of Quantitative EEG, event related potentials and neurotherapy.
- The attendees are required to bring laptops with them. At the workshop the attendees will be supplied with an educational software and EEG files from the HBI (Human Brain Index) reference database.
- Each day will consist of two parts: *Morning*, lecturing theory, practicing with software on EEG files taken with the HBI reference database, and *afternoon*, working with *hardware/software*, recording EEG and analyzing EEG files recorded during the workshop.
- The attendees will be supplied with hardware for recoding EEG. Each attendee will be able to make recordings and analysis by him/herself.
- Every one will be able to purchase *the book* "Quantitative EEG, event related potentials and neurotherapy" by professor Jury D. Kropotov

Conference Faculty

Prof. Jury D. Kropotov
Director of the Laboratory of the Institute of the Human Brian, of the Russian Academy of Sciences, St. Petersburg, Russia; USSR State Prize Winner. Professor II of the Norwegian University of Science and Technology, Trondheim, Norway.

****ADDED BONUS:**
Alexander Grushvitskiy, A Mitsar manager, will be at the workshop to answer any equipment questions and to provide technical support to maximize your on site educational experience.

Conference Schedule
Saturday, May 15, 2010 (DAY 1)

Morning
Topics:

- Mechanisms of generation of EEG rhythms.
- Background EEG as reflection of cortical self regulation.
- What does clinical EEG mean?
- Pathological EEG patterns (slow waves, spikes, paroxysms….) in epilepsy, brain tumors, and some other brain disorders.
- Mapping potentials
- Making Slow Resolution Electromagnetic Tomography (LORETA and s-LORETA) from the potential maps.

Aim is to teach the attendee the foundations of clinical EEG, namely: 1) neuronal basics of brain rhythms generation, 2) methods of recording and montaging, 3) to teach how to distinguish non-EEG artifacts from EEG records, 4) to correct artifacts using available software, 5) to distinguish pathological EEG patterns by means of visual inspection as well as

by means of automated tools, 6) to use brain maps and s-LORETA imaging for depicting the data.
Procedure: lecture (power point presentation is supplied), practice with EEG records on healthy subjects and patients from the HBI database (software and EEG files are supplied).

Afternoon
Topics:

- Recording EEG in resting state (eyes open, eyes closed, hyperventilation)
- Visual inspection of the EEG recording
- Artifact correction
- Automated spike detection.

Aim is to teach the attendee: 1) to place electrodes on the patient head according to 10-20 system, 2) to start, to end and to store an EEG recording, 3) to be able to use the build-in user database to manage the datasets, 4) to remontage the recording.
Procedure: the attendees will be divided into groups. Each group will be supplied with a hardware/software for recording and analysis. One of the attendees will serve as a subject (to be recorded) while the others will do recording.

Sunday, May 16, 2010 (DAY 2)

Morning
Topic:

- Quantitative EEG as a method for neuro-metrics
- QEEG-endophenotypes (biological markers) in healthy population
- QEEG-endophenotypes in brain disorders

Aim is to teach the attendee methods of spectral analysis, including 1) Fourier and wavelet transformations, 2) coherence, 3) event related de-synchronization, as well as to show how these methods enable us to reveal 4) QEEG-endophenotypes of brain disorders such as ADHD, dyslexia, anxiety.
Procedure: lecture, practicing with EEG records on healthy subjects and patients from the HBI database.

Afternoon
Topic:

- Spectral and coherence analysis of EEG recorded on the first day
- Comparing spectral characteristics of recorded EEG with the normative data of the HBI reference database.

Aim is to teach the attendee: 1) to remontage the recording into the HBI database montage, 2) to perform spectral and coherence analysis, 3) to compare the results of the analysis with the HBI database, 4) to make interpretations of the results.
Procedure: the attendees will be divided into groups. Each group will be supplied with software for analysis. The analysis of EEG of the subjects recorded in the first day will be done. Spectra, coherence, theta/beta ratios, asymmetry maps for EEGs recorded in the first day will be computed and analyzed.

Monday, May 17, 2010 (DAY 3)

Morning
Topics:

- Event related potentials (ERPs) as markers of stages of information flow in the brain.
- Association of ERPs components with functioning of brain systems.
- Reflection of dysfunctioning of brain systems in ERPs components.

Aim is to teach the attendee methods of Event Related Potentials, including 1) averaging technique, 2) Independent Component Analysis (ICA), as well as 3) to show the discriminative power of ERPs in ADHD, dyslexia, traumatic brain injury.
Procedure: lecture, practicing with EEG records on healthy subjects and patients from the HBI database.

Afternoon
Topic:

- Recording of EEG in Visual Contingent Performance Task (VCPT).
- Preprocessing EEG
- Computing ERPs by averaging technique.
- Comparison behavioral parameters (omission and commission errors, latencies and variances of responses) with the normative data of the HBI database
- Comparison ERPs with the HBI database
- Comparison ICA components of ERPs with the normative data.

Aim is to teach the attendee: 1) to use Psytask software for presenting tasks provided with the HBI database, 2) to record EEG in one of the tasks (such as VCPT), 3) to compute ERPs and behavioral parameters, 4) to analyze ERPs visually and to make maps was well as LORETA images of ERPs components, and 5) to compare ERPs and ERPs components with the HBI reference database.
Procedure: the attendees will be divided into groups. Each group will be supplied with a hardware/software for recording and analysis. One of the attendees will be served as a subject (to be recorded) while the others will do recording. EEG in the VCPT task will be recorded and analyzed.

Tuesday, May 18, 2010 (DAY 4)

Morning
Topics:

- Neurofeedback and

- Constructing neurotherapy protocols for peak performance by using the recorded EEG files.
- Analysis of EEG records of patients from the HBI reference database.
- Constructing neurotherapy protocols for treatment.

Aim is to teach the attendee to use the HBI reference database for constructing protocols of neurotherapy.

Procedure: the attendees will be divided into groups. Each group will be supplied with an HBI database. The records made during the first days will be analyzed and neurofeedback protocols for peak performance will be suggested. Several records for patients of the HBI database will be analyzed.

Airport information:

The closest International Airport is: **Phoenix Sky Harbor International Airport**

Hotel Information:

To make reservations, please call and ask to make a reservation in the **NOVA TECH EEG GROUP BLOCK BY THE DEADLINE OF MAY 1ST.**

Hilton Garden Inn - 602-470-0500
Rate - $99 One room Suite with one king bed and living room area with sofa sleeper (includes airport shuttle and high speed internet, microwave and fridge in room, fitness center, pool and jacuzzi, full service restaurant and bar)
Hilton Garden Inn Web Site

OR

Holiday Inn Express - 602-453-9900
Rate - $89 Standard Room with one king bed (includes airport shuttle, high speed internet, and hot breakfast buffet, microwave and fridge in room, fitness center, pool and jacuzzi)
Holiday Inn Express Web Site

*The conference center where the Nova Tech EEG Workshops will be held is directly in front of the two hotels listed in the same parking lot so you will be able to walk to training from either hotel.