TITLE

The Next Quantum Leap? Using Big Data Resources to Drive Clinical Neurology and Neuroscience Research

ABSTRACT

The confluence of four important factors is presenting an unprecedented opportunity for advancing both applied clinical medicine and basic biomedical research. These factors are (1) inexpensive parallel-processor supercomputing (2) inexpensive data storage (3) increasingly powerful deep-learning techniques and (4) massive numbers of digitized medical records. The combination of these elements has the potential to allow engineers to draw previously undetectable statistical inferences that can eventually help clinicians diagnose and plan treatments.

Despite the profound research opportunity, big biomedical data resources remain scarce. Reasons include a lack of standardized methodologies for recording and archiving clinical data, as well as the difficulty in parsing the physician notes that give the data the necessary clinical context.

This talk will discuss efforts at Temple University to overcome these and other issues in our creation of the “TUH EEG” data set. This archive comprises some 22,000 archival clinical EEG records recorded at Temple University Hospital from some 15,000 unique patients over the past decade. The corpus includes medical histories and clinical diagnoses along with raw EEG traces. This dataset is sufficiently large and varied to allow the use of some powerful machine learning methods that have only recently been developed by other groups.

BIO

Dr. Iyad Obeid is an Associate Professor of Electrical and Computer Engineering and Bioengineering at Temple University in Philadelphia, PA. His research focuses on neural instrumentation, neural interfaces, and neural signal processing. He holds a doctorate in Biomedical Engineering from Duke University and is an NSF CAREER awardee.

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