

# SEMINAR

November 27, 2014 at **2:00pm**

Sidney Smith Hall, **Room 2101**

**\*Refreshments will be served at 3:00pm in Room 6027A,  
Sidney Smith Hall after the seminar\***

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## **Medical data analysis by Modern Signal Processing Techniques**

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Explosive technological advances lead to current and future exponential growth of massive data-sets in medicine. To better understand such “big data” in the new era, we need innovations in data analysis. Of particular importance is adaptive acquisition of essential features and information hidden in the massive data-sets, for example, the hidden low dimensional dynamics hidden inside the high dimension data; the time-varying periodicity and trend intrinsic to the system. Furthermore, from the practical viewpoint, the robustness of the algorithm to heteroscedastic noise and computational efficiency cannot be ignored.

In this presentation, I will show two modern adaptive signal processing techniques, diffusion maps and synchrosqueezing transform, to meet such needs. We will discuss direct application of our solution the sleep-depth detection problem from the polysomographic signal. If time permits, more applications like anesthetic-depth detection will be discussed.