Advances in Neural Engineering: Neurogenesis, Neurocontrol and Neurochips

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ABSTRACT. Neural engineering is an emerging discipline to understand the organizational principles and underlying mechanisms of the biology of neural systems and to study the behavior dynamics and complexity of neural systems in nature. In this presentation, we will briefly overview the recent developments in this emerging field, Neural Engineering from neurogenesis to neurochips. Then we will discuss the ongoing research activities at the Neural Engineering and Informatics Lab at ASU. We focus on our recent finding about the relative contributions of maturation to the dynamical behavior of respiration during ontogeny in the neonate and the underlying mechanisms of the respiratory network.

Short Curriculum Vitae

Prof. Metin Akay received his B.S. and M.S. in Electrical Engineering from Bogazici University, Istanbul Turkey in 1981 and 1984, respectively and a Ph.D. degree from Rutgers University in 1990. He has played a key role in promoting the biomedical education in the world by writing several prestigious books and editing the Biomedical Engineering Book Series published by the Wiley and IEEE press. Prof. Akay is a recipient of the IEE EMBS Service Award, a IEEE Third Millennium Medal and the IEEE Engineering in Medicine and Biology Society Early Career Achievement Award in 1997, the Young Investigator Award of Sigma Xi Society, Northeast Region in 1998 and 2000, is a fellow of IEEE and Institute of Physics, and serves on numerous editorial and advisory boards of several international journals.

Prof. Akay’s main expertise is in Neural Engineering, Biomedical Informatics and Biomedical Imaging. Dr. Akay's Neural Engineering and Informatics Lab is interested in developing an intelligent wearable system and investigating the developmental abnormalities of medullary respiratory neurons during early maturation and the sudden infant death syndromes.