HARVEY MUDD
C O L L E G E

Silent speech recognition, brain control of prosthetics and the challenges of biological signal processing

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The focus of my research at BAE Systems has been the development of biological signal exploitation algorithms and systems. This talk will discuss two of such endeavors. The majority of the talk will cover the challenges faced in developing The Mouthed-speech Understanding and Transcription (MUTE) silent speech recognition system. Rather than using traditional acoustic speech signals, the MUTE system recognizes silent or mouthed speech using the electrical activity generated by the face and neck musculature. The MUTE discussion will culminate in a demo of the current version of the system on an Android device.
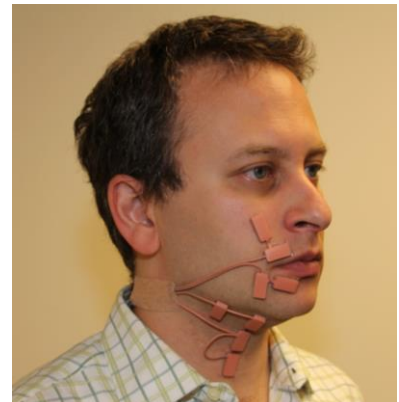
The rest of the talk will discuss our latest project, the Cortical Command & Control for Permanent Operability (C3PO) program, which seeks to provide highly degree of freedom control of a prosthetic limb using a combination of electroencephalography (EEG), computer vision and control theory.

Bio: Dr. Geoffrey Meltzner '95 is the Section Lead of the Biological, Audio, and Speech Signal processing group at BAE Systems Advanced Information Technologies, in Burlington, MA. After having graduated from HMC in 1995 as an engineer, Dr Meltzner moved back across the country to attend grad school at MIT where he earned an S.M in Electrical Engineering & Computer Science in 1999 and a Ph.D. in Speech & Hearing Bioscience and Technology in 2003. His time at MIT was spent working on characterizing the perceptual shortcomings of artificial larynxes.

Immediately after completing grad school, he joined what is now BAE Systems and created a small research group that focuses on audio, speech, and biological signal exploitation. Our signature accomplishment has been the development of the MUTE (Mouthed-speech Understanding & Transcription Engine) that is able to recognize silent speech on an Android platform.