國立中山大學應用數學系
學術演講

講　者：劉子齊 博士後研究員（台大數學系）

講　題：Removal of electrical stimulus artifact in local field potential recorded from subthalamic nucleus by using manifold denoising

時　間：2023/12/26 (Tuesday) 14:10~15:00

地　點：理 SC 4009-1 教室

茶　會：13:30

Abstract

　　Deep brain stimulation (DBS) is an effective treatment for movement disorders such as Parkinson's disease (PD). However, local field potentials (LFPs) recorded through lead externalization during high-frequency stimulation (HFS) are contaminated by stimulus artifacts, which require to be removed before further analysis. In this study, a novel stimulus artifact removal algorithm based on manifold denoising, termed Shrinkage and Manifold-based Artifact Removal using Template Adaptation (SMARTA), was proposed to remove artifacts by deriving a template for each stimulus artifact and subtracting it from the signal.

　　Under a low-dimensional manifold assumption, a matrix denoising technique called optimal shrinkage was applied to design a similarity metric such that the template for stimulus artifacts could be accurately recovered. SMARTA was evaluated using semirealistic and realistic LFP signals. The results indicated that SMARTA removes stimulus artifacts with a modest distortion in LFP estimates. The proposed SMARTA algorithm helps the exploration of the neurophysiological mechanisms of DBS effects.

敬 請 公 告！ 歡 迎 參 加！

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