

Abstract

The following thesis presents the results of a systematic research on resting-state electroencephalographic (EEG) activity in disorders of consciousness. First of all, the thesis discusses the state-of-the-art knowledge of the methods currently used to assess the level of consciousness, focusing on the neuroimaging techniques used in the diagnosis of patients with impaired consciousness after a severe brain injury. Active and passive paradigms are discussed, along with the measures reflecting circadian activity and the structure of resting-state connectivity networks. In the experimental part, we present the data, including overnight EEG recordings from the pediatric patients with disorders of consciousness from The Alarm Clock Clinic, used to assess sleep architecture and resting-state connectivity patterns. The discriminating value of the proposed measures in differentiating the patients behaviorally diagnosed as unresponsive from those in the minimally conscious state was evaluated with machine learning techniques.