

Resource Summary Report

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MAUDS

RRID:SCR_003175

Type: Tool

Proper Citation

MAUDS (RRID:SCR_003175)

Resource Information

URL: <http://www.geb.uma.es/mauds>

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Description: We define a simple method to detect cortical states that can be applied in real time for offline processing of large amounts of recorded data on conventional computers. Also, the online detection of up and down states will facilitate the study of cortical dynamics. An open-source MATLAB toolbox, and Spike 2-compatible version are made freely available. Intracellular recordings from different areas of the cerebral cortex were obtained from both in vitro and in vivo preparations during slow oscillations. A method that separates up and down states recorded intracellularly is defined and analyzed here. The method exploits the crossover of moving averages, such that transitions between up and down membrane regimes can be anticipated based on recent and past voltage dynamics. We demonstrate experimentally the utility and performance of this method both offline and online, the online use allowing to trigger stimulation or other events in the desired period of the rhythm. This technique is compared with a histogram-based approach that separates the states by establishing one or two discriminating membrane potential levels. The robustness of the method presented here is tested on data that departs from highly regular alternating up and down states. The neuronal cortical network generates slow (1 Hz) spontaneous rhythmic activity that emerges from the recurrent connectivity. This activity occurs during slow wave sleep or anesthesia and also in cortical slices, consisting of alternating up (active, depolarized) and down (silent, hyperpolarized) states. The search for the underlying mechanisms and the possibility of analyzing network dynamics in vitro has been subject of numerous studies. This exposes the need for a detailed quantitative analysis of the membrane fluctuating behavior and computerized tools to automatically characterize the occurrence of up and down states.

Abbreviations: MAUDS

Resource Type: software application, data processing software, source code, data analysis software, software resource

Defining Citation: [PMID:17849017](#)

Keywords: electrophysiology, intracellular recording, cortical state, real time, matlab, spike2, cerebral cortex

Funding: Programa de Perfeccionamiento de Doctores of the Junta de Andaluca ; Ministry of Education and Science - Spain

Availability: THIS RESOURCE IS NO LONGER IN SERVICE

Resource Name: MAUDS

Resource ID: SCR_003175

Alternate IDs: nif-0000-30603

Record Creation Time: 20220129T080217+0000

Record Last Update: 20260804T043200+0000

Ratings and Alerts

No rating or validation information has been found for MAUDS.

No alerts have been found for MAUDS.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 1 mentions in open access literature.

Listed below are recent publications. The full list is available at [RRID](#) .

Beed P, et al. (2020) Layer 3 Pyramidal Cells in the Medial Entorhinal Cortex Orchestrate Up-Down States and Entrain the Deep Layers Differentially. Cell reports, 33(10), 108470.