Article

Study for detection of areas affected by Epilepsy using the information contained in the EEGs through deep learning

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**Abstract:** Recently, machine learning techniques have been introduced in biomedicine, specifically epilepsy classification models using electroencephalograms (EEGs) distinguishing abnormal scalp EEGs of patients with neurological diseases, which were originally classified as 'normal' by experts. Additionally, given the spatial coverage of the EEG which is not a regular grid we’ve considered graphs as the structure for our neual networks, that’s Graph Convolutional Networks. We’re using EEGraph to model EEGs as graphs, so the connectivity between different brain areas could be analyzed. Our experiments will be modeled with a publicly available large scalp from Physionet EEG Siena-EEG with 15 subjects). To our knowledge, this is the first study that proposes recognizing areas of the brain affected by Epilepsy.

**Keywords:** Epilepsy; electroencephalography (EEG); machine learning (ML) Graph Neural Networks (GCN)

0. How to Use This Template

The template details the sections that can be used in a manuscript. Note that each section has a corresponding style, which can be found in the “Styles” menu of Word. Sections that are not mandatory are listed as such. The section titles given are for articles. Review papers and other article types have a more flexible structure.

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3.1. Subsection

3.1.1. Subsubsection

Bulleted lists look like this:

* First bullet;
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1. First item;
2. Second item;
3. Third item.

The text continues here.

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All figures and tables should be cited in the main text as Figure 1, Table 1, etc.



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| **Title 1** | **Title 2** | **Title 3** |
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| entry 2 | data | data 1 |

1 Tables may have a footer.

The text continues here (Figure 2 and Table 2).

|  |  |
| --- | --- |
| C:\Users\martin\Downloads\testFigure.tif | C:\Users\martin\Downloads\testFigure.tif |
| (**a**) | (**b**) |

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| entry 2 | data | data | data |
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| entry 3 | data | data | data |
| data | data | data |
| data | data | data |
| data | data | data |
| entry 4 | data | data | data |
| data | data | data |

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This is example 1 of an equation:

|  |  |
| --- | --- |
| a = 1, | (1) |

the text following an equation need not be a new paragraph. Please punctuate equations as regular text.

This is example 2 of an equation:

|  |  |
| --- | --- |
| a = b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z | (2) |

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**Appendix A**

The appendix is an optional section that can contain details and data supplemental to the main text—for example, explanations of experimental details that would disrupt the flow of the main text but nonetheless remain crucial to understanding and reproducing the research shown; figures of replicates for experiments of which representative data is shown in the main text can be added here if brief, or as Supplementary data. Mathematical proofs of results not central to the paper can be added as an appendix.

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