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DEPARTMENT OF COMPUTER SCIENCE
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Summary of "Patient-tailored connectomics visualization for the assessment of white matter atrophy in traumatic brain injury"

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1 SUMMARY

The main goal of this paper is to show a connectomics visualization technique in order to understand better the effect of Traumatic Brain Injury (TBI). The authors presented a "characterization of TBI-related structural damage to the brain via multimodal neuroimaging and personalized connectomics". MRI scans were collected from three different patients who suffered from different TBI. Data have been pre-processed and the tractography was reconstructed using the software *TrackVis*. The most interesting part of the article is the one related to the visualization methodology proposed. The authors introduced a circular visualization they addressed as *Connectograms*. Parcelated regions are displayed in a circle with radially aligned elements ordered according the anatomical disposition and different colors were assigned to each of them. The outermost circle represents the cortical parcelations, while the five innermost circles are heat maps which display five different structural measures associated with the corresponding regions. Inter-region connectivity is represented with edges within the innermost circle. Thanks to the tractography, for each edge was possible to identify the starting and the ending point. Two different colors where used to classify edges into two categories: the first contains edges that involved only one affected region, while another color was used to display links that involve two affected regions. A different level of transparency was used to represent the weight of the links. Figure Ref shows the connectograms described so far.

2 COMMENTS

The goal-driven connectomics visualization presented is quite effective. Still, since there are many regions involved, the visualization is not always very clear. However, it is quite easy to make comparison within the three patients. In fact, different connectivity patterns can be easily discovered. Quite effective is also the usage of transparency to represent the weight of the edges. The transparency reduce the visual disorder and attract the user attention only on strong links, while weak edges fade into the background.

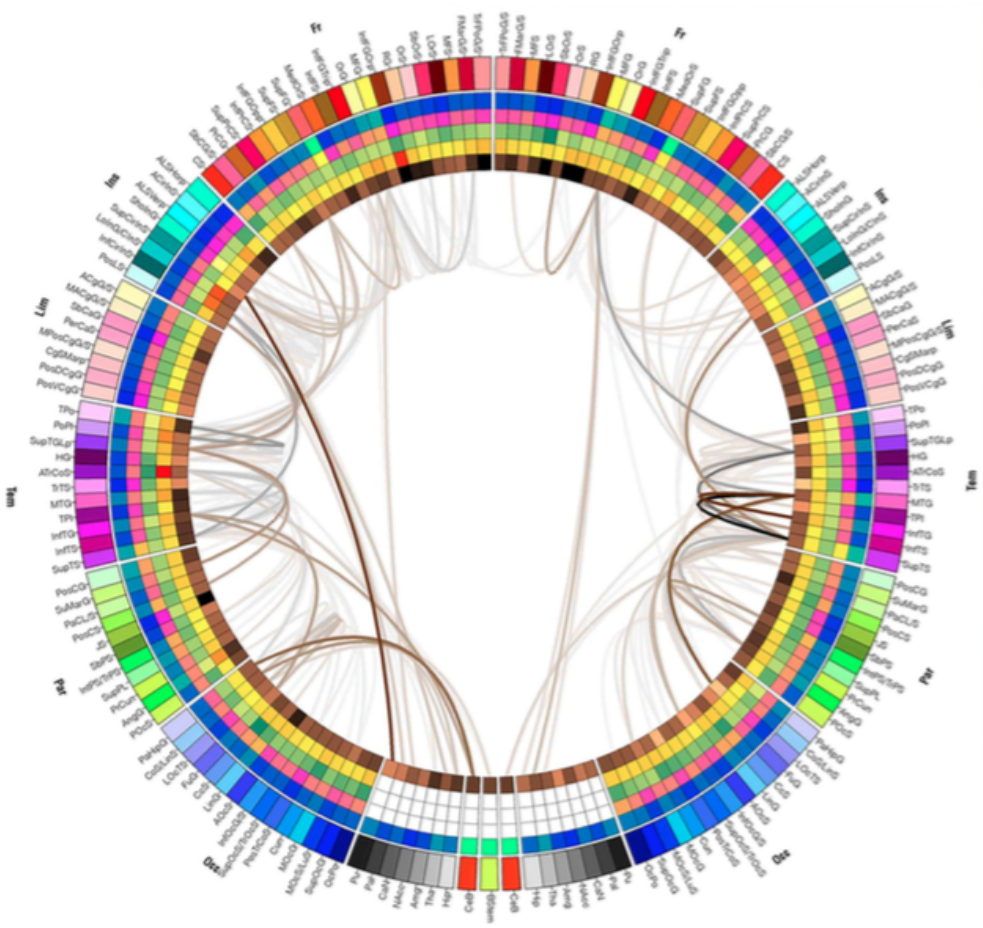

Figure 1: This figure shows the connectograms presented in the paper. The five innermost circles represent heat maps about structural measurement, while in the outermost circle percolated regions are presented. The transparency level is used to display different weights. The use color is related to the kind of edge. Edges that involve on affected regions are depicted in brown, while in gray are depicted edges that link two affected regions.