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| **Project name**  Efficient statistical tools for networks and their applications | Applicant institution  Leipzig University |

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| **#** | **Impact** | **Success indicators** | | **Information sources/ methods** |
|  | Project objectives (outcomes)  *What are the specific project objectives? Project objectives refer to the specific use and application of the results (outputs)*  Add further rows to the table to enter further project objectives (outcomes). | *Which quantitative and qualitative indicators can be used to measure, whether the respective project objectives have been reached?*  *Note: Ideally, only one indicator should be listed per project objective (outcome). However, it may be necessary to consider more than one indicator to record results and make statements regarding the achievement of objectives.* | | *How can the data be gathered that is required to assess the indicators (information sources, methods if applicable)?* |
| OC1 | To develop an algorithm to estimate the Laplacian spectral distribution of a network with O(n) computational complexity and space (where n is the number of nodes in the network). | We will demonstrate the algorithm speed theoretically and by simulations. We will show that our algorithm obtains at least equivalent spectral density approximations whether compared to current approaches faster. | | We will implement the algorithm in R and make it freely available in the package statGraph (https://CRAN.R-project.org/package=statGraph). Also, we will publish the results in journals/conferences. |
| OC2 | To develop a method to identify the nodes’ contribution to a specific eigenvalue density. | We will show empirically which nodes are associated with already known eigenvalues, such as the -1, 0, and 1. | | We will implement the algorithm in R and make it freely available in the package statGraph (https://CRAN.R-project.org/package=statGraph). Also, we will publish the results in journals/conferences. |
| OC3 | To apply the developed methods in biological networks, e.g., functional brain networks. | We will model the functional brain networks using random graphs | | We will publish the results in journals/conferences. |
|  | Results (outputs)  *Which specific results of the measures/activities are envisioned for reaching the project objectives?*  Add further rows to the table to enter further results (outputs). | *Which quantitative and qualitative indicators can be used to measure, whether the results have been achieved?*  *Note: Ideally, only one indicator should be listed per result (output). However, it may be necessary to consider more than one indicator to record results and make statements regarding the achievement of objectives.* | | *How can the data be gathered that is required to assess the indicators (information sources, methods if applicable)?* |
| OP1 | Please specify | Please specify | | Please specify |
| OP2 | Please specify | Please specify | | Please specify |
|  | Measures/activities[[1]](#footnote-2)  *List the intended measures/activities (use the title of the measure/activity used in the project description)*  Insert new rows in the table for further planned measures/activities. | | *Please assign the measures/activities to the desired project results (****outputs****) by entering the corresponding number in this column (OP1, OP2, etc.)* | ***Please assign the measures/activities to the desired project objectives (outcomes) by entering the corresponding number in this column (OC1, OC2, etc.)*** |
| M/A1 | Please specify | | Please specify | Please specify |
| M/A2 | Please specify | | Please specify | Please specify |
| M/A3 | Please specify | | Please specify | Please specify |

1. A measure/activity can be presented on its own or as part of a group; e.g. ‘five events’, provided that these contribute to the same project objective (outcome). [↑](#footnote-ref-2)