In this study, we proposed a novel method of removing outlier fibers to improve connectome analysis. Our proposed method is based on the physical characteristics of each fiber: fiber length, mean curvature, and mean density. For the threshold of outliers to be objective and valid, robust statistics based on the Mahalabinos distance were applied.

As a result, our proposed method could remove better than conventional length-based outlier removal, and connectomes filtered by the SIFT or LiFE method were also improved.

The proposed method could contribute to making the study of structural connectomes more reliable by reducing spurious outlier fibers, and it can be widely applied to connectome-based studies in various fields.