BigSTeP toolbox

Updated on Sep. 27, 2019 by Yusuke Takeda

1. Introduction

BigSTeP toolbox is a suite of MATLAB functions to perform BigSTeP proposed in the following paper.

Takeda Y., Itahashi T., Sato M., Yamashita O., 2019. Estimating repetitive spatiotemporal patterns from many subjects' resting-state fMRIs. NeuroImage 203:116182. https://doi.org/10.1016/j.neuroimage.2019.116182

BigSTeP is an extension of SpatioTemporal Pattern estimation (STeP) (Takeda et al., 2016). From resting-state brain activity data, such as MEG and fMRI, STeP estimates repetitive spatiotemporal patterns without using their onset and shape information (Fig. 1). Recently, STeP was extended to BigSTeP so that it can be applied to big databases, such as the Autism Brain Imaging Data Exchange (ABIDE). From many subjects' resting-state data, BigSTeP estimates spatiotemporal patterns that are common across subjects (common spatiotemporal patterns) as well as the corresponding spatiotemporal patterns in each subject (subject-specific spatiotemporal patterns) (Fig. 2).

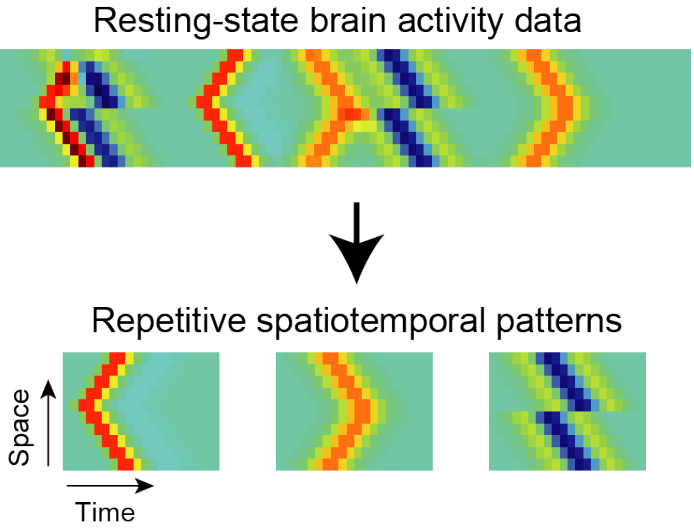

Figure 1: Purpose of STeP.

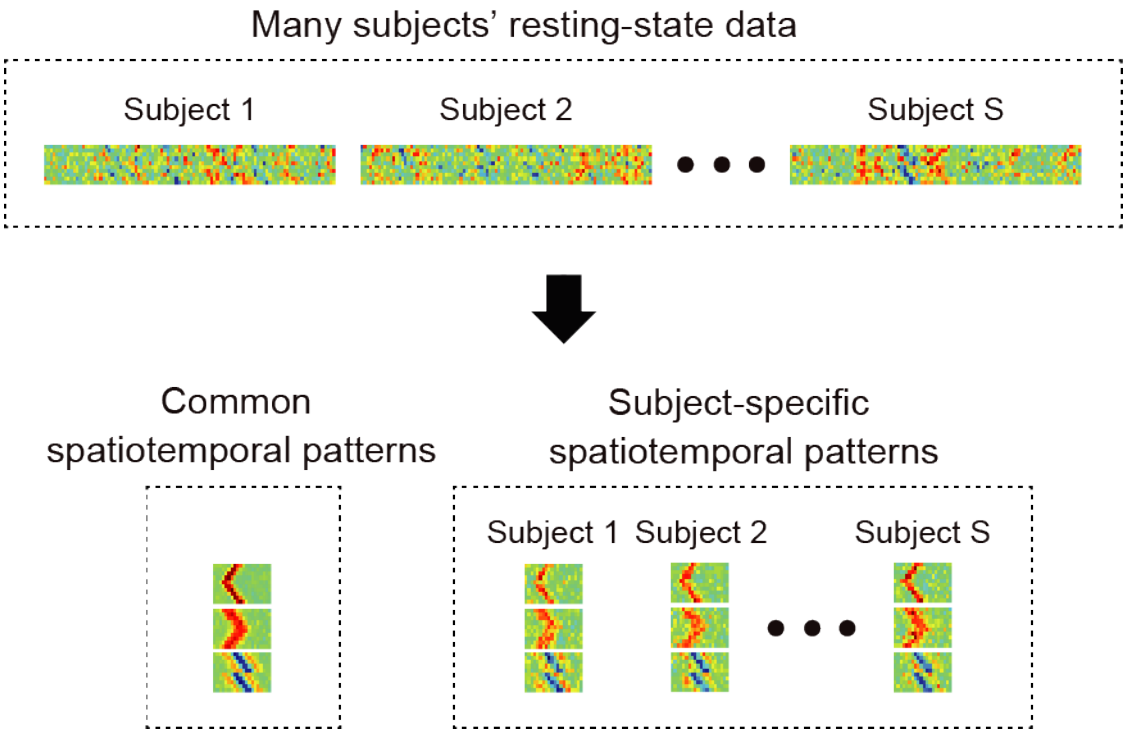

Figure 2: Purpose of BigSTeP.

2. System Requirements

BigSTeP toolbox works on MATLAB (R2010a or later).

3. Demo programs

Please start from the following demo programs to learn how this toolbox works.

bs_demo_STeP_m : Demo program for STeP

bs_demo_BigSTeP.m : Demo program for BigSTeP

4. Main programs

bs_STeP.m : This program performs STeP

bs_BigSTeP.m : This program performs BigSTeP

5. Feedback & Bug report

Any feedback and bug report are welcome. Please contact me if you have any questions (takeda@atr.jp).

6. Licensing & Copy right

7. Acknowledgements

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8. References

STeP paper:

Takeda Y., Hiroe N., Yamashita O., Sato M., 2016. Estimating repetitive spatiotemporal patterns from resting-state brain activity data. NeuroImage 133:252-65. https://doi.org/10.1016/j.neuroimage.2016.03.014

BigSTeP paper:

Takeda Y., Itahashi T., Sato M., Yamashita O., 2019. Estimating repetitive spatiotemporal patterns from many subjects’ resting-state fMRIs. NeuroImage 203:116182. https://doi.org/10.1016/j.neuroimage.2019.116182