応用研究

共生社会　心と体の健康を支える脳科学とセンシング技術

The DecNef Toolbox : An Enhanced Toolkit for fMRI Decoded Neurofeedback

～A Matlab Toolbox Designed to Enhance Access to DecNef and Improve Efficiency in Various Contexts～

概要

Decoded neurofeedback (DecNef) is a closed-loop neuroimaging technique that enables participants to produce target neural representations in a non-conscious manner. This method is used to address a wide range of experimental research questions and clinical applications in neuroscience. It has been shown to be efficient in reducing symptoms of PTSD and depression.

特徴

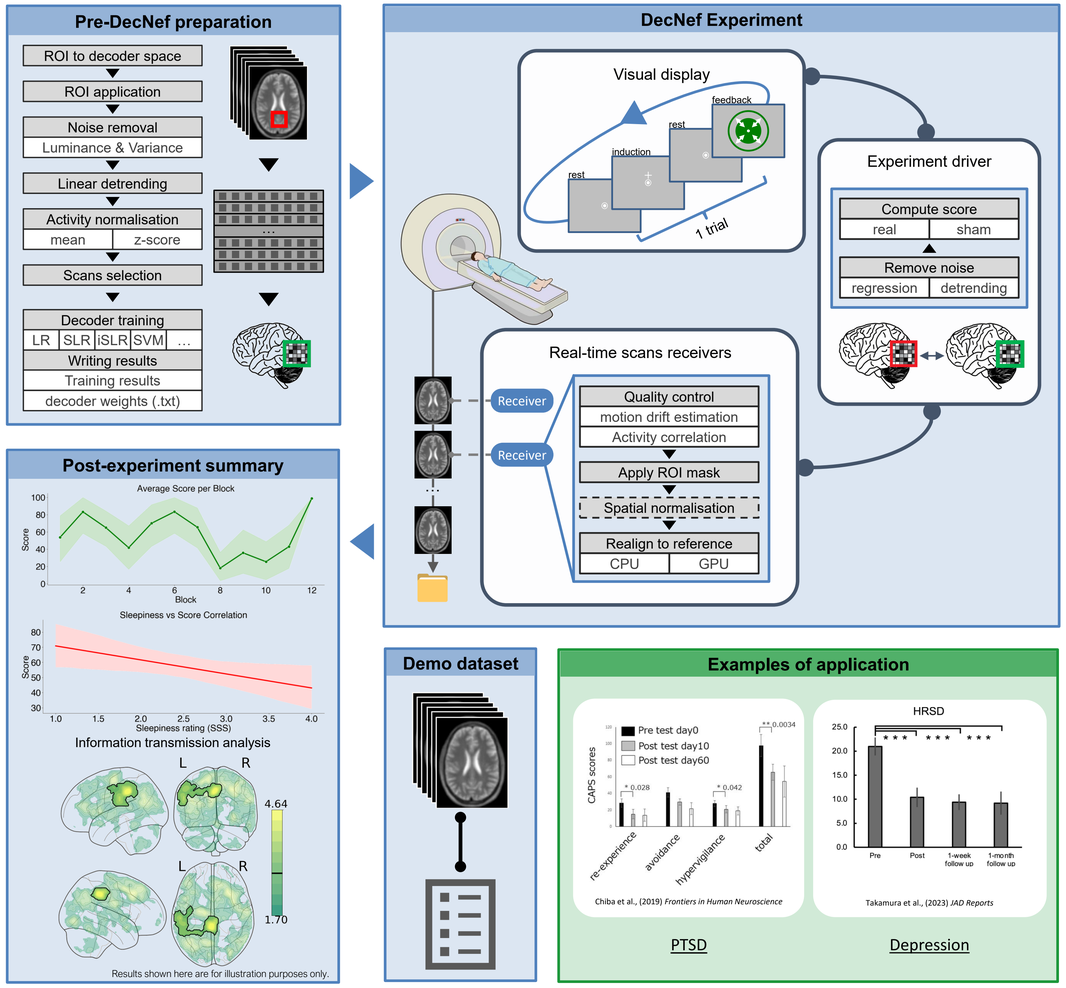
- The toolbox contains a demonstration dataset, a series of standard preprocessing steps and analysis scripts, allowing researchers to familiarise themselves with the technique and easily integrate it into their pipelines.
- The toolbox integrates state-of-the-art preprocessing of fMRI data and various machine learning decoders to best suit each researcher’s needs while keeping the process standardised and easy to share with collaborators.
- The main feature is a modular, customisable and easy-to-use program to perform DecNef experiments in the scanner. This new program benefits from GPU computation to perform DecNef in MNI space and improve performance.

今後の展開

- We will publish the toolbox, continue to maintain it and add new features (FCNef) to keep it up-to-date. We plan to create a community using GitHub and Discord to assemble DecNef users and gather their needs and opinions.

テーマ「社会課題と向き合う科学技術の最前線」との関連

- DecNef already demonstrated clinical applications. Our new toolbox will boost researchers' ability to apply DecNef in various contexts, reducing the time from lab experiments to real clinical applications for patients (PTSD, depression).



株式会社国際電気通信基礎技術研究所
脳情報通信総合研究所

連絡先：脳情報研究所 担当 Six Hugo (シックスユーゴ) E-mail: hugo_six@atr.jp

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