User Guide

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Based on our research paper "Unsupervised abundance matrix reconstruction transformer-guided fractional attention mechanism for hyperspectral anomaly detection", we prepare a demo file for researchers to investigate our theory and algorithm. The prerequisites and the steps to run the algorithms are summarized below.

1   Prerequisites

The demo code of TGFA-AD is conducted under Ubuntu 22.04.4 LTS system with NVIDIA RTX 3090 GPU, and the software environments are itemized as below:

- Python 3.10.9

- Torch 2.0.0

- Numpy 1.23.5

- Scipy 1.10.0

- tqdm 4.64.1

- einops 0.6.1

- Torchmetrics 0.11.4

- MATLAB 2023a

2   Run the code

The proposed TGFA-AD is a Python-MATLAB cross-platform algorithm, in which HyperCSI blind source separation is performed under the MATLAB environment. Then, we save the estimated abundance for the Pytorch-implemented ASCR-Former training. Finally, we back to the MATLAB environment to perform the FAA mechanism. For the algorithm demonstration, we save the ASCR-Former results in the file named "ASCR Former result". Thus, users can directly open the "demo.m", and set the "training" flag to 0 for using the saved result; or set the "training" flag to 1 for training the ASCR-Former.

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3 Citation

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