

# Medical/Bio Research Topics I : Week 09 (02.05.2024)

## Mid-term Summary

중간 요약

# Hands-on Machine Learning (1): Predicting Memory Performance

- Locally acquired data ( $n = 90$ )
  - Structural, resting state functional, and diffusion-weighted MRI
  - Demographic information including age, sex, and years of education
  - Memory performance scores

- Training dataset:  $n = 80$ 
  - Images
    - Grey matter map: [train/GM/001-080.nii.gz](#)
    - White matter map: [train/WM/001-080.nii.gz](#)
    - Regional homogeneity map: [train/ReHo/001-080.nii.gz](#)
    - Posterior cingulate gyrus (PCG)-based correlation map: [train/PCGcorr/001-080.nii.gz](#)
    - Fractional anisotropy map: [train/FA/001-080.nii.gz](#)
    - Mean diffusivity map: [train/MD/001-080.nii.gz](#)

## – Features

- Grey matter features: [train/GM.csv](#)
- White matter features: [train/WM.csv](#)
- Regional homogeneity features: [train/ReHo.csv](#)
- PCG-based correlation features: [train/PCGcorr.csv](#)
- Fractional anisotropy features: [train/FA.csv](#)
- Mean diffusivity features: [train/MD.csv](#)

- Test dataset:  $n = 10$ 
  - Images
    - Grey matter map: [test/GM/001-010.nii.gz](#)
    - White matter map: [test/WM/001-010.nii.gz](#)
    - Regional homogeneity map: [test/ReHo/001-010.nii.gz](#)
    - PCG-based correlation map: [test/PCGcorr/001-010.nii.gz](#)
    - Fractional anisotropy map: [test/FA/001-010.nii.gz](#)
    - Mean diffusivity map: [test/MD/001-010.nii.gz](#)

## – Features

- Grey matter features: [test/GM.csv](#)
- White matter features: [test/WM.csv](#)
- Regional homogeneity features: [test/ReHo.csv](#)
- PCG-based correlation features: [test/PCGcorr.csv](#)
- Fractional anisotropy features: [test/FA.csv](#)
- Mean diffusivity features: [test/MD.csv](#)

# Hands-on Machine Learning (2): Predicting Sex

- Data from UK Biobank (<https://www.ukbiobank.ac.uk/>) ( $n = 500$ )
  - Structural, resting state functional, and diffusion-weighted MRI
  - Demographic information including sex and age

- Training dataset:  $n = 450$ 
  - Images
    - Grey matter map: [train/GM/001-450.nii.gz](#)
    - White matter map: [train/WM/001-450.nii.gz](#)
    - Default mode network map: [train/DMN/001-450.nii.gz](#)
    - Fractional anisotropy map: [train/FA/001-450.nii.gz](#)
    - Mean diffusivity map: [train/MD/001-450.nii.gz](#)



## – Features

- Grey matter features: [train/GM.csv](#)
- White matter features: [train/WM.csv](#)
- Default mode network features: [train/DMN.csv](#)
- Fractional anisotropy features: [train/FA.csv](#)
- Mean diffusivity features: [train/MD.csv](#)

- Test dataset:  $n = 50$ 
  - Images
    - Grey matter map: [test/GM/001-050.nii.gz](#)
    - White matter map: [test/WM/001-050.nii.gz](#)
    - Default mode network map: [test/DMN/001-050.nii.gz](#)
    - Fractional anisotropy map: [test/FA/001-050.nii.gz](#)
    - Mean diffusivity map: [test/MD/001-050.nii.gz](#)

## – Features

- Grey matter features: [test/GM.csv](#)
- White matter features: [test/WM.csv](#)
- Default mode network features: [test/DMN.csv](#)
- Fractional anisotropy features: [test/FA.csv](#)
- Mean diffusivity features: [test/MD.csv](#)