



Orbit Structure Segmentation

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Outline

- Feature Selection for Medical Image Deep learning
 - Introduction
 - Further Research
- 7 orbit structures segmentation (CAU MED)
 - Completed Segmentation Images

Introduction

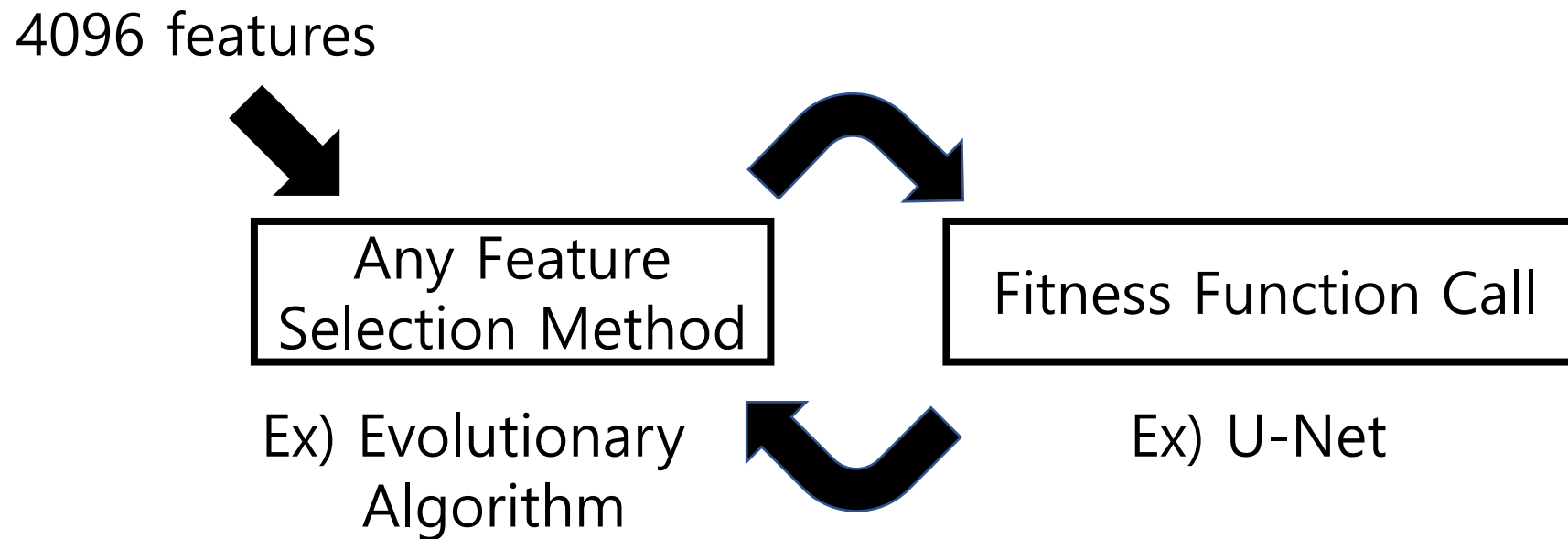
- Extracting the appropriate pixel values from computed tomography (CT) images as inputs to medical deep learning models can have a significant impact on the model's performance.
- The window setting method for visibility is traditionally used, but this is not a method that prioritizes the performance of deep learning models.
- Therefore, we propose an effective preprocessing method for medical image deep learning applying the feature selection method through this study. Through this, we intend to improve the performance of deep learning models and make major contributions to the medical entire field.

Further Research

- We plan to find some feature extraction methods at the CT image level that improves the performance of medical deep learning models.
- Lee et al. (2018) noted that Window setting optimization was largely overlooked in past studies. Also, in my survey, there were not many studies that dealt with this majorly.
- Mainly, a window pre-define by a human expert was used, and a study to find a meaningful value in a pixel value with a unique value of 4096 found about one of the above studies.

Further Research

- Proposed method's Feature Selection Framework: Wrapper



- Deep learning approach

Further Research

- Experiment setting candidates :
 - 1) Coronal 4 rectus & fat and Sagittal eyelid segmentation model
 - 2) Active-Inactive diagnostic model using the above information as main information
- Comparison model candidates :
 - Window Setting Optimization (WSO) model
 - Pre-define model
 - non-processing model

7 orbit structures segmentation (CAU MED)

- Goal: Design Pre-trained deep learning model for segmentation of 7 structures in the orbit for use in other domains.
- Globe(눈), Superior rectus (상직근), Inferior rectus (하직근), Medial rectus (내직근), Lateral rectus (외직근), Optic nerve (시신경), Upper eyelid (상안검)
- Finally, we aim to complete the segmentation for a total of 1492 patients with 1 axial (AX), 1 coronal (CO), 1 sagittal left (LT), and 1 sagittal right (RT) image.

Completed patients

- Total: 1492 patients
- Completed:

Target Type	Completed
AX 내직근	375
AX 눈	455
AX 시신경	382
AX 외직근	381
CO 눈	431
SA 눈	383
SA 상안검	352
SA 상직근	406
SA 시신경	374
SA 하직근	293

References

Lee, Hyunkwang, Myeongchan Kim, and Synho Do. "Practical window setting optimization for medical image deep learning." *arXiv preprint arXiv:1812.00572* (2018).