텍스트이(가) 표시된 사진

자동 생성된 설명

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**Subject : Interim report**

**Professor : 이 지 형**

**김 동 원(전자전기공학부, 2018312292)**

**임 승 재(소프트웨어학과, 2018310773)**

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Contents

[Intended task and goal 3](#_Toc88275320)

[Data Source 3](#_Toc88275321)

[Analysis of input data 3](#_Toc88275322)

[Progress & outcomes for current models 10](#_Toc88275323)

[Intended model and plan for next steps 14](#_Toc88275324)

[References 14](#_Toc88275325)

**Table Contents**

[Table 1 Sonar Image 3](#_Toc88261323)

[Table 2 Underwater photographed images 3](#_Toc88261324)

**Figure Contents**

[Figure 1 Example of image name 4](#_Toc88275567)

[Figure 2 Underwater photographed image: name tokening 6](#_Toc88275568)

[Figure 3 Underwater photographed images: class name and the number of data 9](#_Toc88275569)

[Figure 4 underwater photographed images: get unique class name 9](#_Toc88275570)

[Figure 5 Underwater photographed images: unique names 10](#_Toc88275571)

[Figure 6 Implementation of ResNet(1) 11](#_Toc88275572)

[Figure 7 Implementation of ResNet(2) 12](#_Toc88275573)

[Figure 8 Implementation of DenseNet(1) 13](#_Toc88275574)

[Figure 9 Implementation of DenseNet(2) 14](#_Toc88275575)

# Summary of task, goal, analysis of input data, and metrics

In order to collect marine debris, it is intended to conduct a design survey more quickly and efficiently. To this end, we intend to design an artificial intelligence model that can classify multi-labeled underwater photographed images.

Classifying models are going to be trained and validated by images taken underwatered. Trained models including VGGNet, ResNet, DenseNet, and DarkNet will be compared. The loss of each model is going to be analyzed by using LIME which is a kind of XAI(eXplainable Artificial Intelligence). By focusing on the result of LIME, the strengths of weaknesses of models can be compared. The analyzed result can be used for further research for constructing proper model for marine debris classification.

We will use ‘해양 침적 쓰레기 이미지’ dataset from AIHub. The dataset provides training data and validation data, and we intend to train the model using training data and test the model using validation data. In particular, only underwater photographed images, excluding sonar image data, will be used. The reason is that in the case of sonar images, it is not easy to classify them into models we implement because they are images taken using special equipment related to sound waves and are different from general images. In addition, since the data provided by the dataset is image data of different sizes, preprocessing such as adjusting the size is required. Images in 'root/data' and 'root/test\_data' of the submitted task are the results of preprocessing. The code used for preprocessing can be found in 'root/src/utils/AI\_preprocessing.py'.

We will use the accuracy of the model and the results observed through LIME as the metrics for evaluating the model

# Data Source

We are using “해양 침적 쓰레기 이미지” [1] data from <https://aihub.or.kr/>. The exact address of the data is <https://aihub.or.kr/aidata/30754>.

# Explanation for our model

# Explanation of experiments

1. Training process

BCEWithLogits was used as a criterion in the process of training the model. It was judged to be the most suitable criterion for implementing the multi-label classification model. In addition, SGD was used as an optimizer and CosineAnnealingLR was used as a scheduler. The model is basically supposed to learn a total of 100 epochs, but early stopping is applied to terminate the learning if there is no improvement in the valuation loss during 10 epochs. In this case, the model recording the lowest validation loss is stored in the 'root/model' path.

1. Hyperparameters

ResNet: ResNet uses three hyperparameters (block, layers, num\_classes). Block determines which block ResNet will use, BasicBlock or Bottleneck. The layers determine how the layers of ResNet will be configured. In our project, we used [2, 2, 2, 2] to use the most basic form of ResNet. num\_classes must convey how many classes the dataset consists of.

VGGNet: VGGNet uses only one hyperparameter. You must deliver how many classes the dataset consists of through num\_classes.

DenseNet:

DarkNet:

1. Validation

We removed some of the train data and used it for validation. The important thing in the validation stage is that since it is multi-label classification, the method of simply selecting the largest value from the model output cannot be used to find the accuracy of the model. Instead, a method of selecting values greater than a certain threshold after taking sigmoid to the model output was used.

# Explanation for our test data

As mentioned above, the model will be tested using validation data provided by the "Marine Deposition Waste Image" dataset.

# References

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