

Submission for Model Validation

This document is intended to provide a guidance for the submission of model validation. Multiple submissions are allowed. Please limit your submission once a day.

1. Supported Language:

Python3

2. Tasks:

Before submitting your model, please read the classification tasks.

Task 1 (Respiratory Sound Classification at Event Level):

Task 1-1 is a binary class classification challenge (Normal and Adventitious).

Task 1-2 is a multiclass classification challenge (Normal, Rhonchi, Wheeze, Stridor, Coarse Crackle, Fine Crackle, Wheeze & Crackle).

Task 2 (Respiratory Sound Classification at Record Level):

Task 2-1 is a ternary class classification challenge (Normal, Adventitious, and Poor Quality).

Task 2-2 is a multiclass classification challenge (Normal, CAS, DAS, CAS & DAS, or Poor Quality).

3. File Format:

The submitted files must be compressed in zip format. **The main script** (main.py) should be provided in the submitted files, which is the executable file for model evaluation. **The Readme.md and the requirements.txt** should be provided to describe the model architecture and list all the dependencies of your python project, respectively.

The command line and parameter requirements of the execution code are as follows:

```
python3 main.py --task task_level --wav /path/to/wav_path/ --out  
/path/to/output.json
```

The task_level is 11, 12, 21, or 22 (representing task 1-1, task 1-2, task 2-1, and task 2-2, respectively).

Notice that the wav files for respiratory sound classification at event level (task 1-1 & task 1-2) are segmented wav files.

The format of output json (**UTF-8**) is as follows:

```
{
  wav_file_name1: predicted_type1,
  wav_file_name2: predicted_type2,
  wav_file_name3: predicted_type3,
  ...
}
```

For task 1-1, the predicted type for each wav file is “Normal” or “Adventitious”.
 For task 1-2, the predicted type for each wav file is “Normal”, “Rhonchi”, “Wheeze”, “Stridor”, “Coarse Crackle”, “Fine Crackle”, or “Wheeze & Crackle”.
 For task 2-1, the predicted type for each wav file is “Normal”, “Adventitious”, or “Poor Quality”.
 For task 2-1, the predicted type for each wav file is “Normal”, “CAS”, “DAS”, “CAS & DAS”, or “Poor Quality”.

4. Evaluation:

Submissions are evaluated based on the following metrics including sensitivity (SE), specificity (SP), average score (AS), and harmonic score (HS).

$$SE = \frac{\text{\# of correctly predicted adventitious events/records}}{\text{\# of total adventitious events/records}}$$

$$SP = \frac{\text{\# of correctly predicted normal events/records}}{\text{\# of total normal events/records}}$$

$$AS = \frac{SE + SP}{2}$$

$$HS = \frac{2 * SE * SP}{SE + SP}$$

The score for each task is as follows:

$$\text{Score} = \frac{AS + HS}{2}$$

The total score is as follows:

$$\begin{aligned} \text{Total Score} = & 0.2 * \text{Score}_{1-1} + 0.3 * \text{Score}_{1-2} + \\ & 0.2 * \text{Score}_{2-1} + 0.3 * \text{Score}_{2-2} + \text{Bonus} \end{aligned}$$

*Bonus

Note that a bonus is provided after the final submission to award the submission with significant runtime improvement (**top-6**). The calculation is as follows.

1. Rank based on the runtime.
2. Calculate the relative runtime difference of top-6.
3. Perform a log scale on the relative difference as the bonus for top-6.