9wnReport Date: 06/17/2022
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From: What is today's lunch?


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**Summary**


The second data collection trip has been conducted with Mia. 250 audio samples were collected with DJI Phantom 4 Pro. 115 samples for 1 payload, 85 samples for 2 payloads, and 50 samples for unloaded. Also, Deep Learning(DL) techniques were applied to train and evaluate models using data from prior studies. Convolutional Neural Network(CNN) and Recurrent Neural Network were employed alongside Feature Extraction including MFCC, Mel, etc.


**What 'What is today's lunch?' completed this week:**

- **Data Collection trip**

  Data have been collected via the data split program. Audio data are obtained with 10 seconds each.

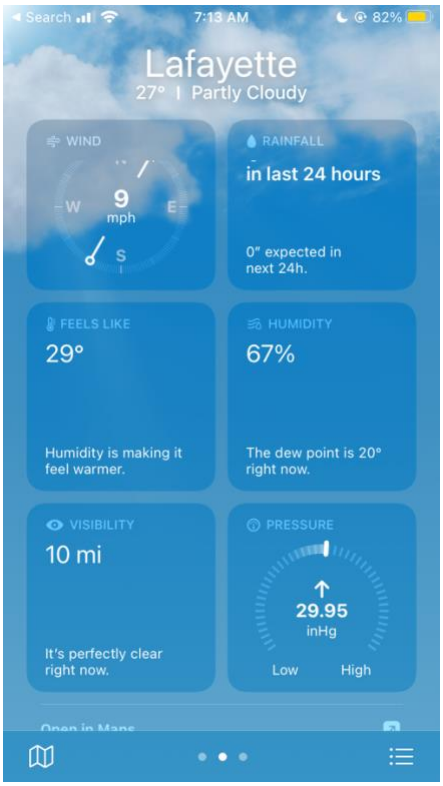


**Fig. 1 Weather Condition**

Still, at least 1000 samples are required as Deep Learning(DL) would be employed in data. Further data collection trips are scheduled for next week. Evo 2 Pro will be also employed on the next trip.

- **DL applied in previous data.**
  Accuracy alongside confusion matrix is measured.
  - CNN with 5 fold cross validation
    https://colab.research.google.com/drive/1CWcUFPd4026Clfn336i5OekkbHYiAkjG?usp=sharing
  - RNN-LSTM 5 features combination
    https://colab.research.google.com/drive/1NNvfKIEKLituqomnWo1QHTNC8YKY-9Mx?authuser=1#scrollTo=Fo8TsALzurS5

| Feature | Accuracy |
|---|---|
| MFCC | 85% |
| Mel | 75% |
| Contrast | 48% |
| Chroma | 91% |
| Tonnetz | 61% |
| Combination | 95% |

**Things to do by next week**

- Employing CNN and RNN for data from previous works.
- Going on a data collection trip with Mia.

**Problems or challenges:**

- There are datasets that Yaqin has collected. However, it is not large enough to apply Deep Learning algorithms. Therefore, it is required to collect more data or apply data augmentation to the original dataset.

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