Progress report to PI (last week of March)

What has been done in March

- Nov 29^{th} → Group presentation
  - Use RF, DNN, and LSTM models to forecast ammonia.
  - Models were trained with different input size and with or without data smoothing filter.
    (Ammonia data was collected in May and June.)
- Dec $15^{t}h$ → Discuss thesis outline structure with Dr. Yin.
- Jan 21th → Group presentation
  - Use 5 more models to forecast ammonia.
  - Introduce a new data smoothing filter and outlier removal method to perform data cleaning.
    (Ammonia data was collected in Nov and Dec.)
- Feb 21th → Progress report to Dr. Yin (to confrim the ACS abstract content)
- Feb 25th → Last day of calibrating colour spectrophotometer in SHW.
- March 10th → Submission of ACS abstract.
- March 18th → Finalize the coverage of my reserach works. ## Future plan
- Apr 22th → Finish MPhil thesis 1st draft.
- Apr 22th → Group presentation.
- May 11th → EVNG 6050X presentation.
- May 27th → Finish MPhil thesis 1st revision. (Start to shcedule time for oral defense)
- June → Preparing for oral defense
- Jul-Aug → Oral defense

Research plan in Spring semester, 2022	Feb		Mar				April					May		Jun	Jul
	18	25	4	11	18	25	1	8	15	22	29	13	27	30	31
ACS abstract submission (ddl 3/14)															
Finalizing methodology for NH3-N and colour forecasting															
Summarize results															
Drafting abstract for ACS fall conference															
Complete MPhil thesis (ddl 5/27)															
Finalize my research work															
Finish MPhil thesis 1st draft															
Prepare MPhil seminar presentation (present date: 5/4 or 5/11)															
Finish MPhil thesis 2nd draft															
Oral defense (mid Jun ~ mid Jul)															
Preparing for oral defense															
Tentative oral defense time (mid Jun ~ mid July)															
Thesis submission															

Figure 1: plan

Progress report

Key findings in Feb and March

1. Train ammonia forecasting model with colour decreased the model performance.
2. New method was used to increase the model training data quality (i.e., feature engineering).
3. New state-of-the-art model (Transformer) is used and a better model performance is achieved compared to LSTM and DNN.