## Final project - 2021 Fall

### **0. General guidelines**

* Write your own codes by following the instructions below.
* Submit your 1) code, 2) written report (doc or pdf) and 3) video presentation file (TOTAL length of 5 mins or shorter).
  + **Submission link will be announced.**
  + Deadline: by **23:59 pm, Dec. 22.**
* Code cheating will be checked. If you cheat, you will get 0 grades on any occasion.

### **I. Use a unique dataset from Kaggle**

**[Rules for determining your dataset]**

* Reuse your dataset used for the midterm project.

**[What you need to do]**

* Write a code for regression or classification yourself by designing custom CNNs.
* Compare the performance with your midterm project result, and make your CNN outperform the previous method in the midterm project.

**[Grading policy: each item will be graded as one of A, B, and C]**

* Does your CNN outperform the previous method in the midterm project?
* Does the dataset have abundant samples for each training and testing (say more than 100 samples or so)
* Do your codes run well without errors?
* Are there more than three efforts to improve the inference performance?
* Is the report including insightful results and discussions?
* Is the presentation video well explaining the work?

### **II. Generate and use your own custom dataset**

**[Rules for determining your dataset]**

* Make a nontrivial input-output relationship with time dependency
  + the dimensions of the input should be larger than 5.
  + Input and output can be limited/unlimited, discrete/continuous, whatever.
  + Your output should also be time dependent.
    - For instance, Y(t) = X(t)^2 + X(t)/2 - X(t-2) + 3X(t-1)
* Generate training (more than 10,000 samples) and testing datasets (more than 2,000 samples) based on your function.

**[What you need to do]**

* Write a code for regression to approximate your function by designing custom RNNs. Whatever RNN architecture is ok.
* Show your more than two efforts to improve the inference accuracy of the deep learning approach. The efforts include
  + controlling your learning rate
  + modifying your neural network architecture
  + Etc

**[Grading policy: each item will be graded as one of A, B, and C]**

* Is the dataset following the instructions? (size, dimension, and the complexity of the function)
* Do your codes run well without errors?
* Are there more than two efforts to improve the DL inference performance?
* Is the report including insightful results and discussions?
* Is the presentation video well explaining the work?