CS5340_Project

This repository is for the group project of the NUS CS5340 course. We are currently in the topic selection phase.

Instructor Suggested Topics

- **Computer Vision / Image Processing**
  - Techniques for Image Denoising
  - Image Background Generation with VAEs and MRFs
- **Financial / Economic / Political Modeling**
  - Uncertainty Distribution of Sales
  - Modeling Political Behaviors with PGMs
  - Portfolio Risk and Return
- **Robotics Prediction / Control**
  - Robust Deep Reinforcement Learning
  - Drone Trajectory Estimation with HMMs
- **Natural Language Processing**
  - Repairing Multilingual Subtitles with Deep Markov Models
- **Infectious Disease Modeling/Diagnosis**
  - Uncertainty in Patient Diagnosis
  - Modeling the Mortality Risk of COVID-19
  - Modeling COVID-19 Spread
- **Robot Social Navigation/Manipulation**
  - Human Crowd Perception and Modeling
  - Diffusion-based Generation of New Test/Adversarial Environments
  - Hierarchical Diffusion for Manipulation
- **Imitation Learning**
  - Generative-style Imitation Learning
- **Uncertainty in LLMs**
  - Incorporating Uncertainty Estimation into LLMs

Project Abstract

- **Introduction**
  - What is the problem you want to solve?
  - Why do you want to solve it?
  - Why is it important/interesting?
- **Related Work**

    - What other work has been done in this area?
- **Approach/Methodology**
    - How do you propose to solve it?
    - Why do you want to solve it this way?
- **Preliminary Results (if any)**
    - What have you done so far?
- **Ethical/Social Impact Statement**
    - What ethical/social impact would this project have (if any)?
- **AI Tool Use**
    - If you used AI Tools (e.g., LLMs), discuss how they were used.

File Structure

- `./src`
  - Most notebooks.
- `./doc`
  - Several reports.
- `./data`
  - datasets.
- `./references`
    - Papers may be helpful.

Project Requirements

- **Key Dates**
    - Form Teams: **6 Feb**
    - Abstract Due: **4 March**
    - Presentations: **15 April**
    - Report Due: **27 April**
- **Deliverables**
    - **Abstract**
        - NeurIPS LaTeX Template
            - https://www.overleaf.com/latex/templates/neurips-2024/tpsbbrdqcmsh
        - Up to 4 pages (excluding references)
    - **Technical Report**
        - NeurIPS LaTeX Template
        - Up to 8 pages (excluding references)
- **Presentation**
    - 5-10 minutes

Past Projects

- https://github.com/zyzhang1130/CS5340-group-project
- https://github.com/zjwu0522/CS5340
- https://github.com/16261909/CS5340-Project
- https://github.com/hungtrankhanh/CS5340_project
- https://github.com/Yuxuan1998/CS5340_Bert_CRF