

Project Ideas

Fall 2023

Kinds of projects

← (A)

Understand a ML
model (Algo in
more detail).



(B)

- Pick a problem/dataset (Kaggle).
- Play with ML models
- What is the eval criteria?

→ (C)

Implementing a
ML approach from
scratch

Real Project Type A

- E.g SVM

- study Modeling capabilities of different kernels

- study role of different hyper-params

- Study role of Primal v/s Dual approach

- When does it work & when does it not?

- Different Datasets
(Synthetic, Real)

Other Examples

- Neural Networks

- Implement some papers

Idea Project Type B

- ① Pick a problem of interest (e.g. Spam classf., stock price prediction, ...)
- ② Exploratory Data Analysis
→ Feature Engg.
- ③ Try different Model families
— tune hyperparameters
- ④ Choose evaluation Criterion
- ⑤ Which methods worked and why?

Ideal Project Type C

- Pick a non-trivial Family of Algorithms
 - E.g.: Neural Networks
- Implement them from scratch
- List bugs, issues, and other technical challenges encountered
- Compare performance with existing toolkits on accuracy, speed, etc.
- Lessons learnt

What are things we will be looking at?

- How deeply you have thought about the problem?
- Systematic analysis of model / algorithms
- Problem formulation & implementation
[well documented code submission]
- Analysis of weaknesses & strengths of different approaches

* If you use anything from a source online, pl cite it.

What will you submit?

- Submit a project report with all details
 - things that worked & didn't work.
- Submit well documented code/notebooks with proper README files
- 10 slide presentation on your work.

proposal: 1-2 page write up

Project Proposal

(A)

- Which ML approach?
- Which aspects
- Expected Results
- Tools you will use

(B)

- Problem / Dataset
- Pose the problem
- Exp Data Analysis
- ML alg Compare
- Eval Criteriz.
- Which tools you will use

(C)

- Which ML algorithm?
- Frameworks / Lang / Tools you will use.