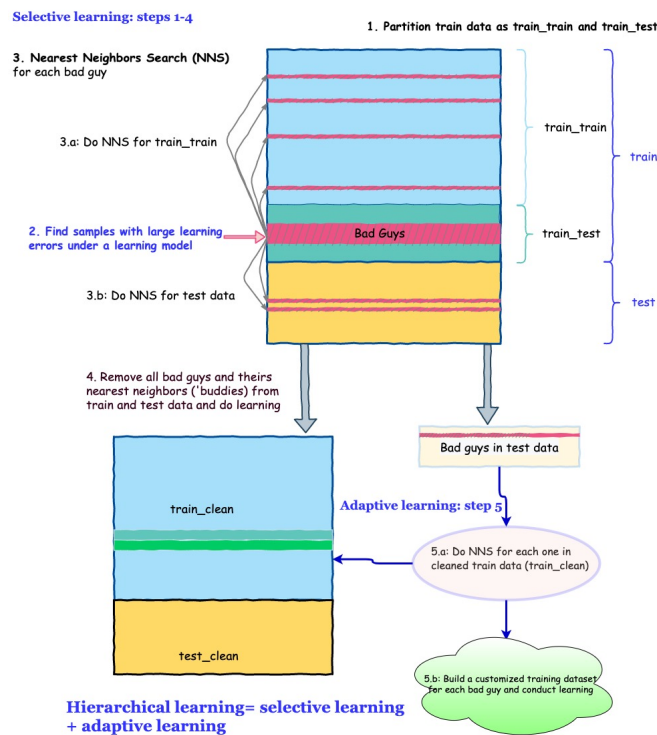


Artificial Intelligence in Fintech Quiz (5)

Hierarchical Learning for Option Pricing (100 points)

Go through hierarchical learning (HL) in our lecture note and code it to conduct implied volatility pricing for the following option datasets

- 1. OptionData12110
- 2. EuropeanOptionCleanData
- 3. BTC option data (this is a new type of option developed and traded recently). A preprocessing is needed for this dataset.



The flowchart of hierarchical learning.

- Compare your HL results with AT LEAST the following peer methods: DNN, SVM, Gradient boosting, extra trees, CNN
 - Your comparisons should include all meaningful metrics
 - Add new features at least three and redo the comparisons
- Enhance HL by identifying the pals of 'bad guys' with the similar Gaussian distribution approach in t-SNE, i.e., use probability rather than distances to measure the similarity between two points (options).
- Enhance HL by identifying the pals of 'bad guys' with kernel tricks: you can use the existing kernels or your own kernel.
- Can we do dimension reduction processing for option data before HL? Why? Show at least one example.
- Draw your conclusion

What should you turn in?

- 1. A folder that contains
 - A report to show details of your analytics (at least 40 pages)
 - your data
 - source files
 - corresponding related output.
- 2. Submit your zipped folder to Canvas