Task 1: Research based case studies (Please use APA-reference)

The goal of this task is to explore and create a research-based APA-referenced solution with real life cases for the following topics based on the group number.

Group Number: 2

Topics: ML Use Cases, Identifying Good Problems for ML, Hard ML Problems

ML Use Cases

ML has a variety of applications, ranging from automation, detection and personalization to things like optimization.

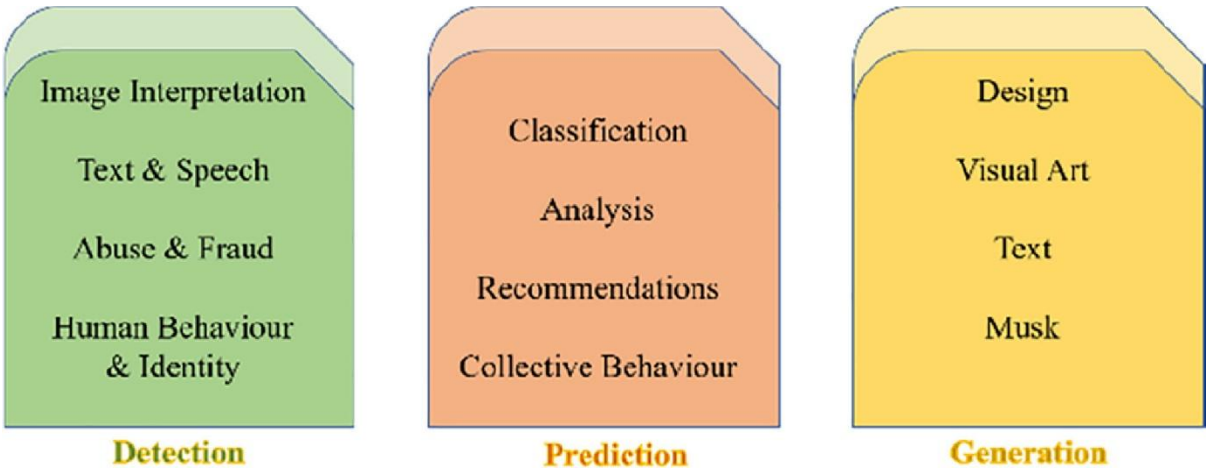


Fig. 1: Sub-fields of machine learning

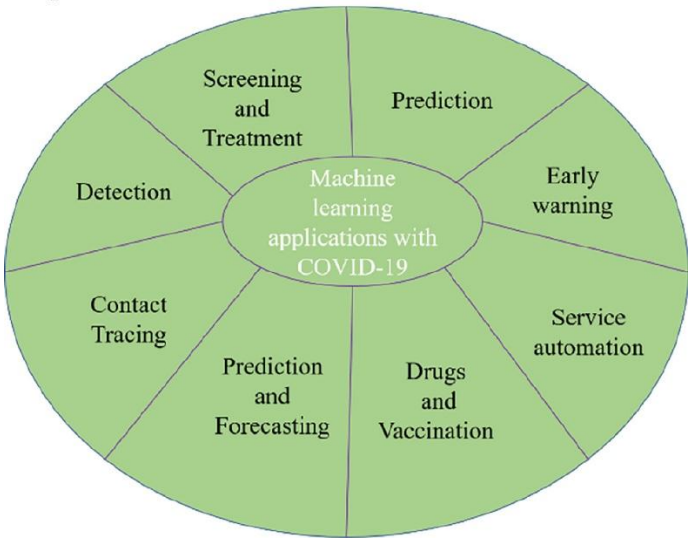


Fig. 2: COVID-19 applications of machine learning

Image Sources: https://www.sciencedirect.com/science/article/pii/S2666285X21000042#fig0003

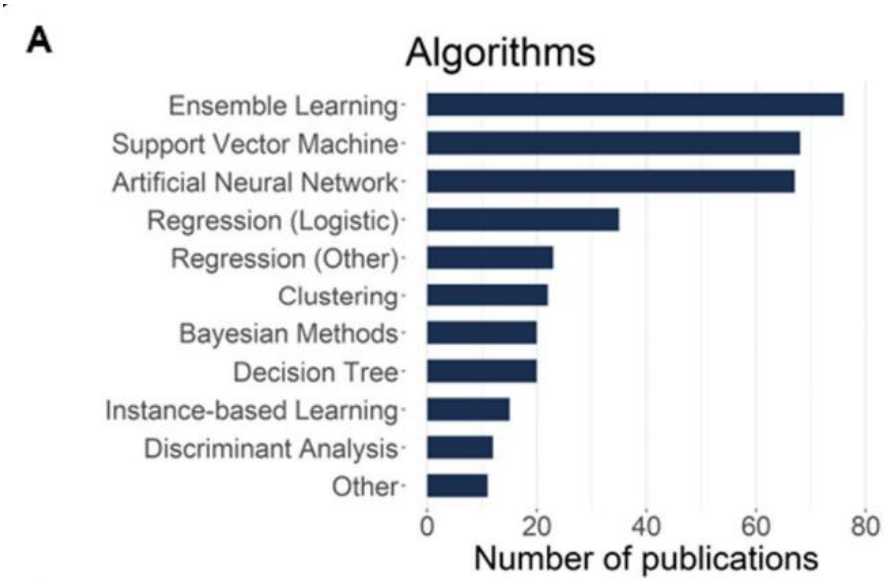
Identifying Good Problems for ML

We can identify applications for Machine Learning by looking for ideal traits like:

- Large size, high quality datasets are available.
- Clear objectives exist (e.g., predicting, classifying, or clustering).
- Data patterns or correlations can be extracted from the given data.

Hard ML Problems

- Datasets may have less or incorrect data.
- Can degrade model performance.
- Ethical concerns such as privacy issues or bias in data.
- Ensuring models perform well on unseen, real-world data beyond training datasets.



Source: https://ojrd.biomedcentral.com/articles/10.1186/s13023-020-01424-6

Fig. 3: Types of algorithms used in medical studies of ML

References

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Schaefer, J., Lehne, M., Schepers, J. et al. The use of machine learning in rare diseases: a scoping review. Orphanet J Rare Dis 15, 145 (2020). https://doi.org/10.1186/s13023-020-01424-6