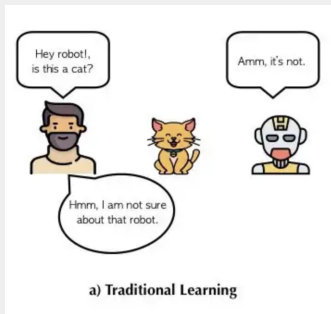# Quality diversity optimisation for post-hoc ensembling
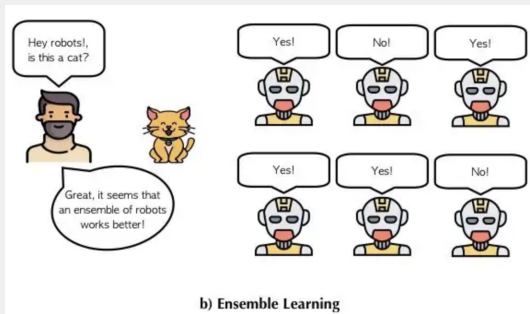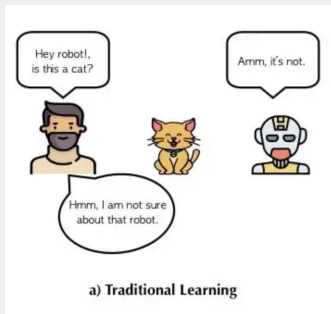
M. Anastacio, L. Purucker, L. Schneider et al.

Dec, 2022

a) Traditional Learning

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b) Ensemble Learning

source: https://towardsdatascience.com

- Ensemble learning
  - ▶ build ensemble and learn models simultaneously
  - ▶ ex: random forest

- Ensemble learning
  - ▶ build ensemble and learn models simultaneously
  - ▶ ex: random forest

- Post-hoc ensembling
  - ▶ optimise the models
  - ▶ build ensemble from bests
  - ▶ ex: autosklearn, autogluon, …

CURRENT METHODS

- Single best model

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- Single best model

- Majority voting

CURRENT METHODS

- Single best model

- Majority voting

- Ensemble voting

- Single best model

- Majority voting

- Ensemble voting

- Greedy ensemble selection

Quality diversity optimisation

Quality

- Balanced accuracy
- ROC AUC

Quality diversity optimisation

Quality

- Balanced accuracy
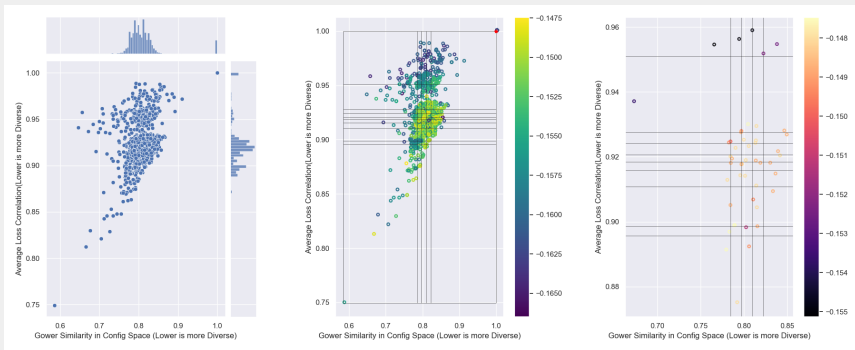- ROC AUC

Diversity

- Loss correlation
- Gower distance

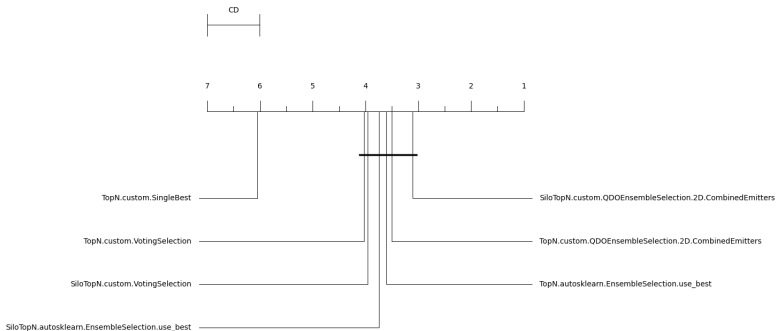# Quality diversity optimisation

Quality
- Balanced accuracy
- ROC AUC

Diversity
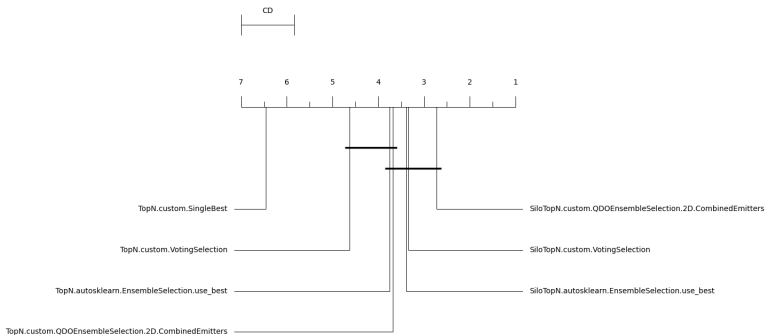- Loss correlation
- Gower distance

Autorank Plot | CD Plot for Task Type Binary Classification; Results for all metrics concatenated

Autorank Plot | CD Plot for Task Type Multi-class Classification; Results for all metrics concatenated

Promising first results

Promising first results but:

- Define the bins differently

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- Add mutations and crossover

Promising first results but:

- Define the bins differently

- Add mutations and crossover

- Define our initial population differently