

Hyper-Parameter Optimization for Latent Spaces in Dynamic Recommender Systems

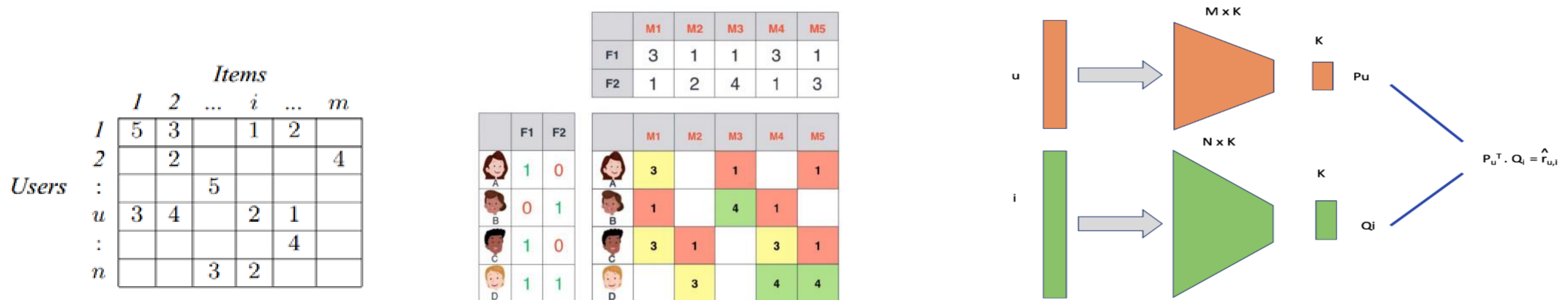
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Goal:

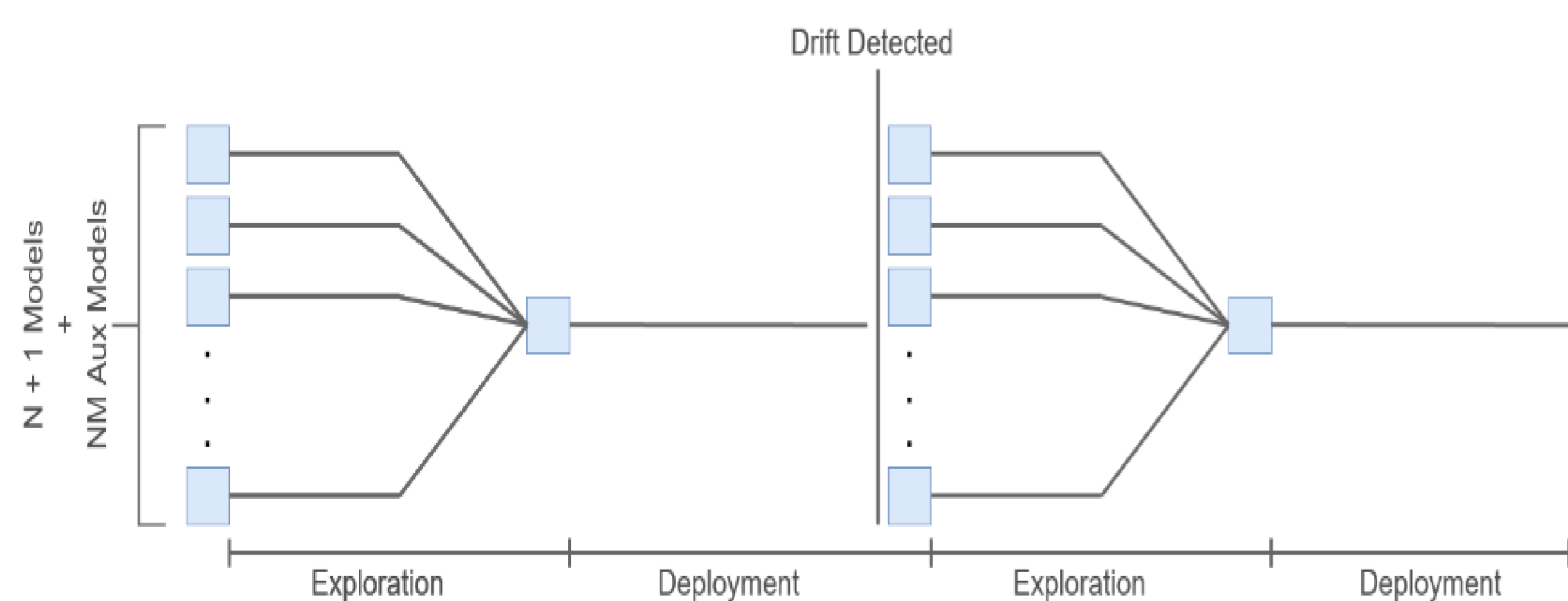
- Our problem deals with Online AutoML in environments where the working conditions change over time.
- The main goal consists of studying online optimization methods for hyper-parameter tuning. In dynamic environments, the “optimal” hyper-parameters might change over time.
- A responsible design (considering the ethical and technological concerns) for a better society.
- This is important to support Europe to lead a new, automated, technological era.

Recommendation Problem:

- Problem: Make predictions for unseen items
- We use streaming data to train and validate the model using the prequential protocol
- Initial Setup: a simple embedding model



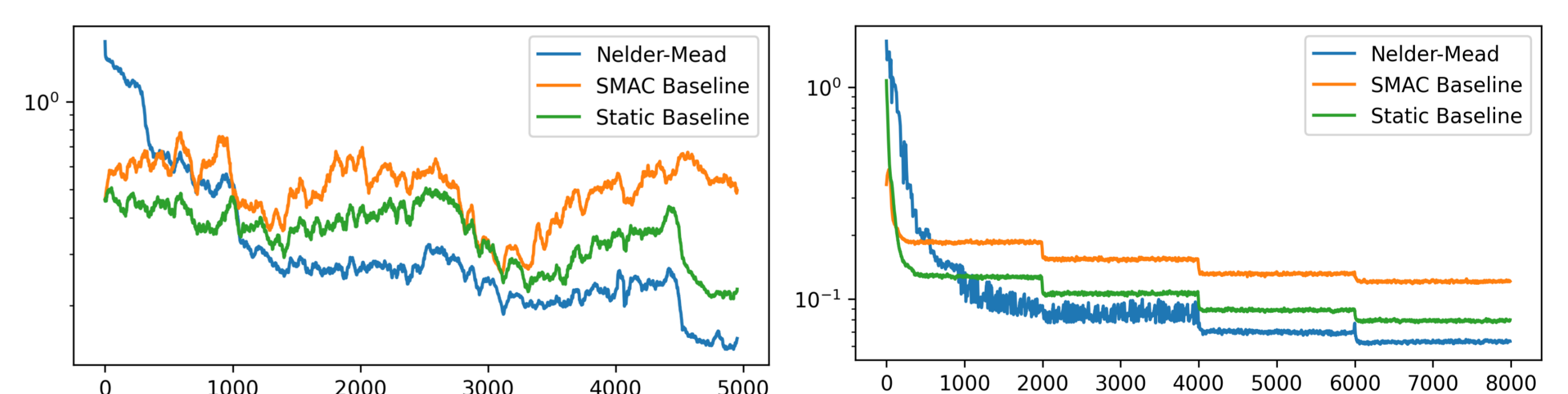
Online AutoML:



Nelder-Mead Algorithm

- It uses a set of heuristics to optimize a loss function
- Starts with random hyperparameter values
- The stopping criteria uses a distance metric

Results:



Achievements

- Outperformed two strong baselines on MovieLens dataset (left picture)
- Outperformed two strong baselines on data generator (right picture)

Outputs:

- Paper accepted on ECML PKDD 2021
- AutoML prototype for latent spaces in dynamic recommendation systems
- Data Generator prototype