UNIVERSITAT DE BARCELONA

DATA SCIENCE @ UNIVERSITAT DE BARCELONA

Master on Foundations of Data Science

Recommender Systems

Deep Neural Networks for YouTube Recommendations

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Introduction

To recommend Youtube videos by implementing NN

Scale

Small ✓

Big ✗

Freshness

Noise

Why NN?

- Widely used in other recommendation systems
- Different metrics.
- Continuous and categorical features can be easily added to the model.

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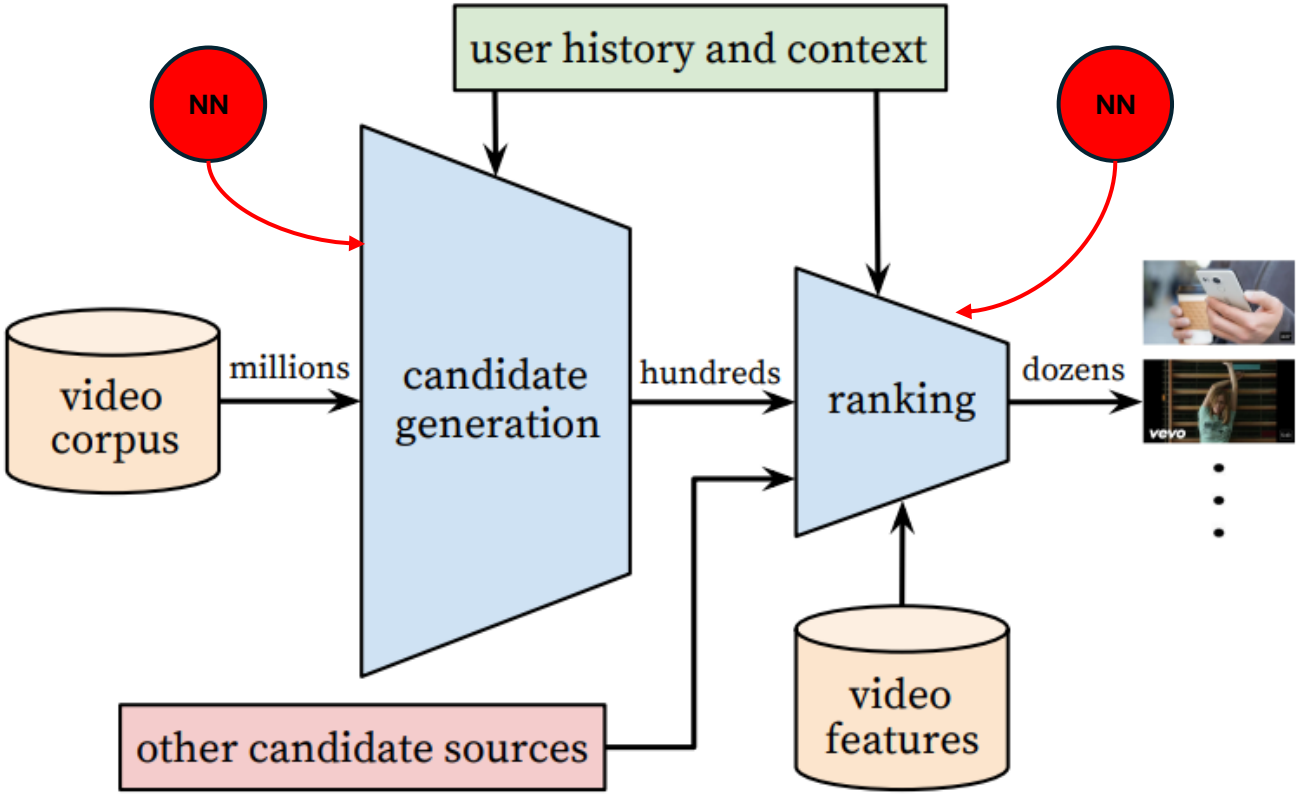
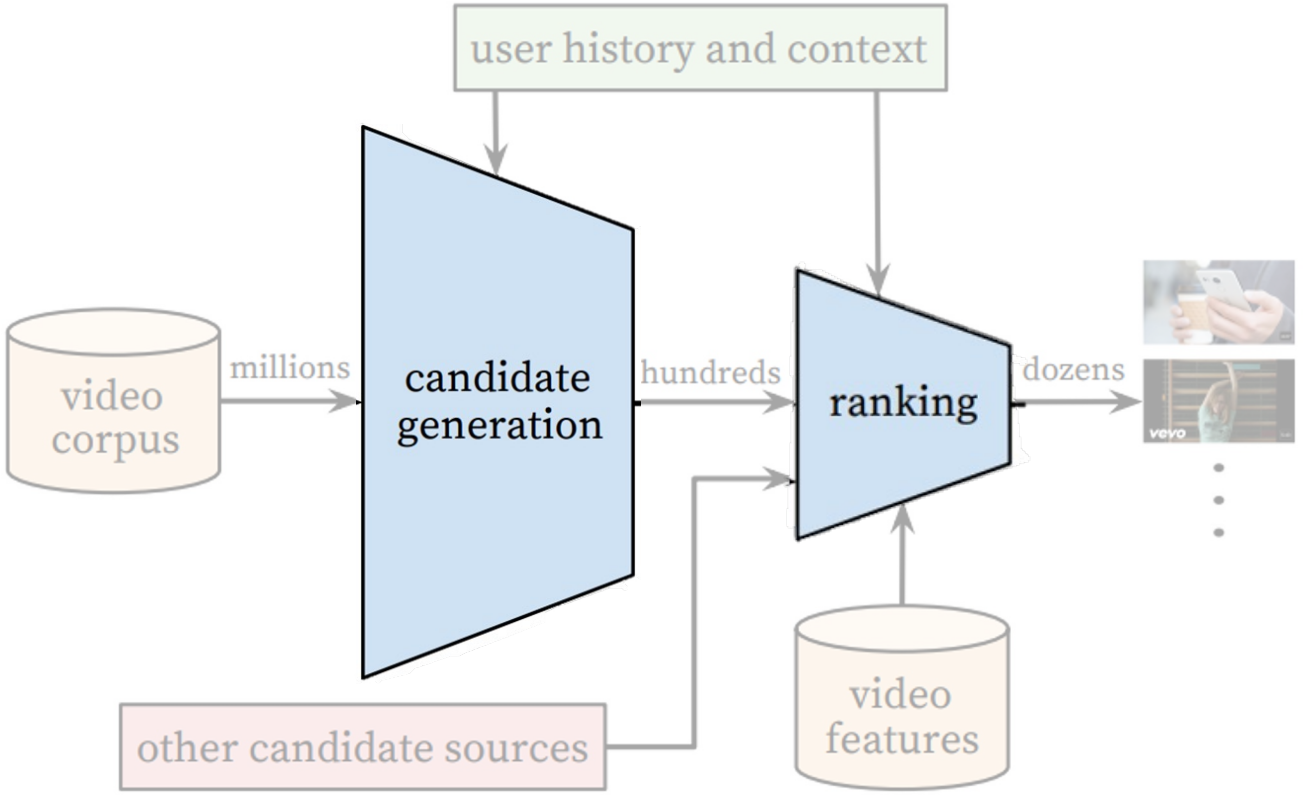
System overview



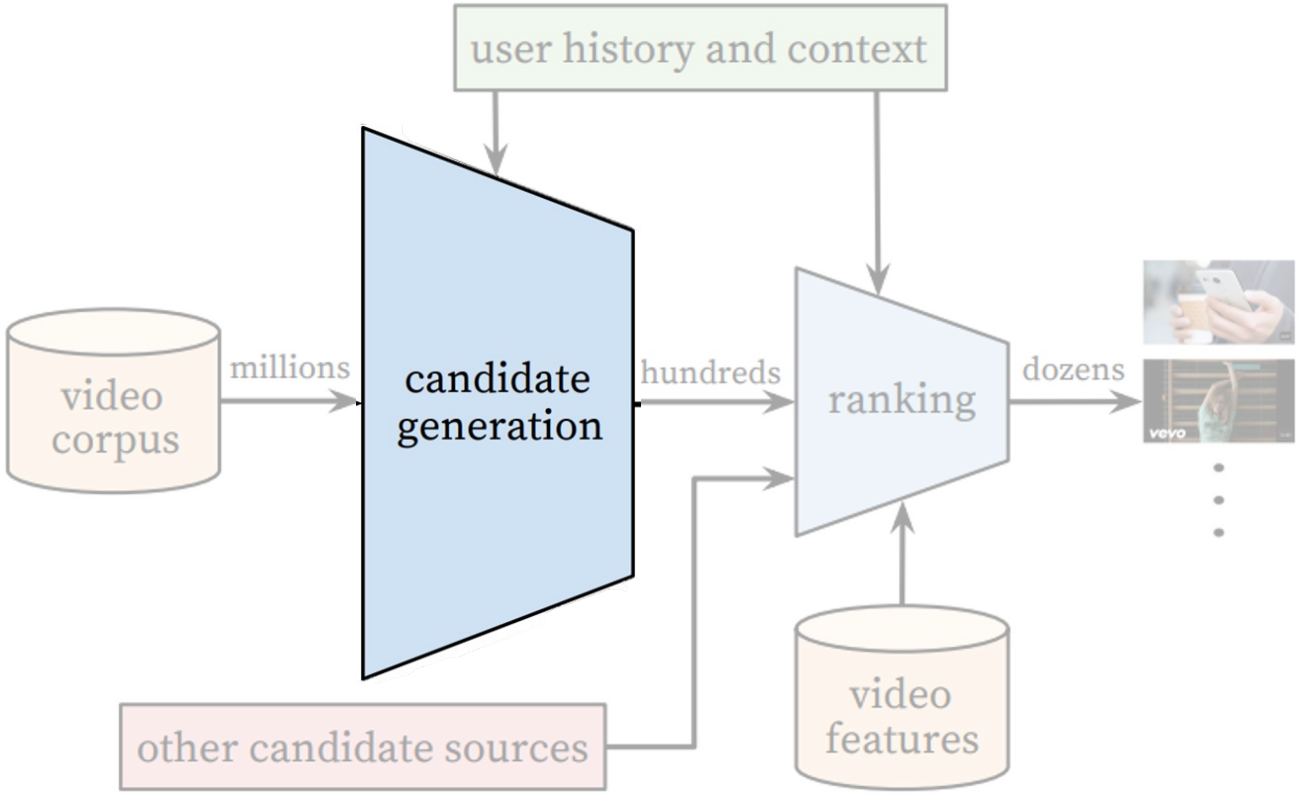
Common properties

- Numeric variables
- Categorical variables
  - Embeddings



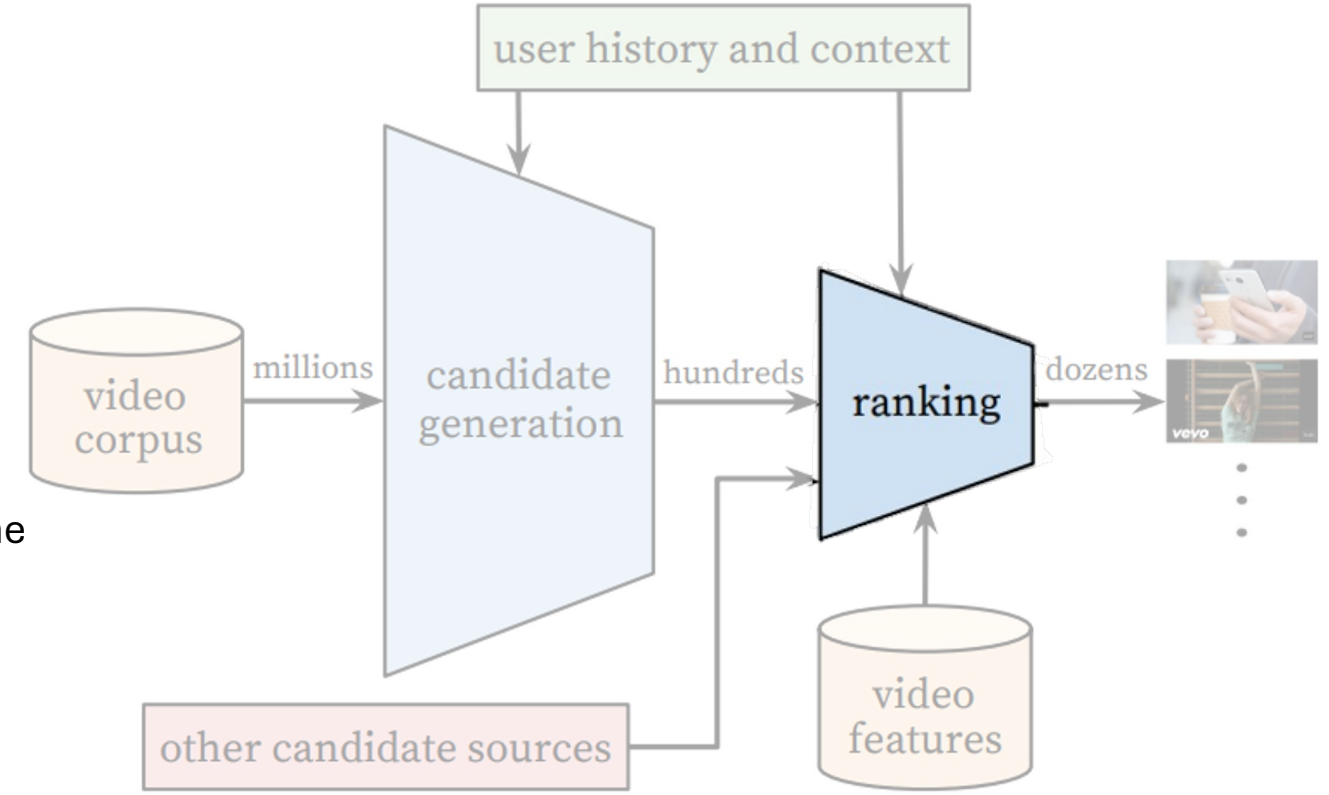
Candidate Generator

- Classification problem, reduced to KNN search.
- Positive if user completed a video.
- Age of the video removes inherent bias.
- Detect non-linear searching patterns



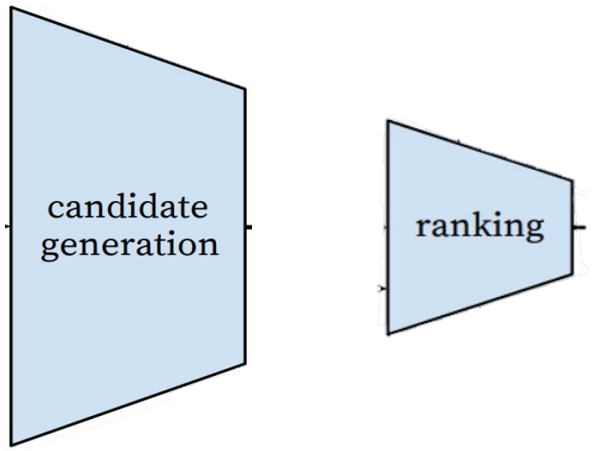
Ranking

- Predict watch time
- Weighted logistic regression
  - Positive → ω = watch time
  - Negative → $\omega = 1$



Conclusions

2 NN



Relevant features

Watched time **Age** **Weighted Logistic Regression**

Better results

Outperform MF methods


YouTube
LIKE
& SHARE