

Deep and Wide Bandits

weekly demo 12th Feb. 2021 by Tengfei

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Feature Engineering

A large historical dataset:

- from Jul. 2019 to Sep. 2020
- 30G+
- 100+ millions of data points
- 69 features

Feature Engineering

- Data integration: formatting, generating batch files, ...
- Data cleaning and selection: 'null' features, useless features, ...
- Feature transformation: word features, cross products, ...
- Feature grouping: user features, campaign features, ...

Coding for deep and wide bandits

- Two different versions, both allow changing in actions space (both are preliminary and are under testing).
- Uploaded in *dev* and *dev_tfl* branches on space-bandits repo of Fellowship.AI.

Coding for deep and wide bandits

The first one is based on the codes of space-bandits, replacing the NN with a wide and deep NN, keeping many same functions from space bandits.

- action selection: Bayesian linear regression + Thompson Sampling
- methods of combining NN output: add, concatenate, linear comb, linear layer

Coding for deep and wide bandits

The second version is rewritten from scratch.

- flexible definition of model architectures (wide-only, deep-only, or wide-and-deep NN), adding multiple embeddings for both wide and deep parts.
- allows user to plug in different models and algorithms (e.g. LinUCB, Thompson Sampling)
- GPU compatible

Next steps:

- Improve the existing codes
- Extract data by month for final testing
- Test and compare the predictive power of wide and deep bandits with space bandits on the latest dataset.