

Deep-learning Based Models for Recommender Systems

Wide & Deep Learning for Regression/Classification Problems

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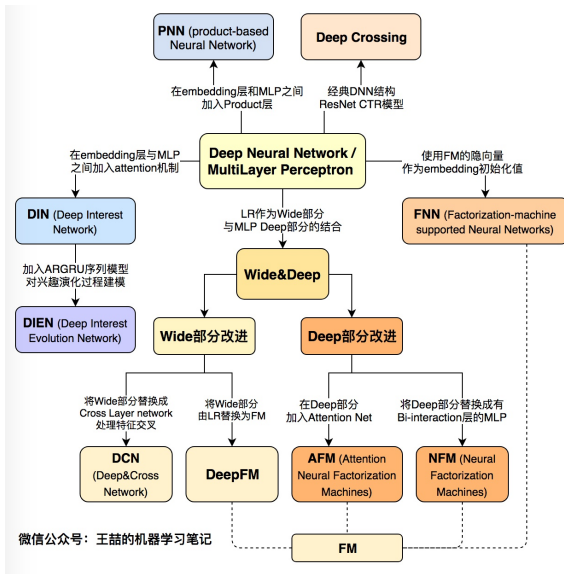
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Overview

History

Milestones

演化图谱¹

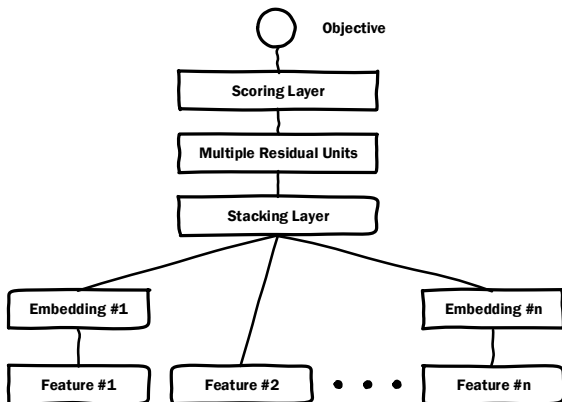


¹王喆. 王喆的机器学习笔记. URL:

<https://www.zhihu.com/question/20830906/answer/681688041>.

Base Model: Deep Crossing²

Microsoft



²Ying Shan et al. "Deep crossing: Web-scale modeling without manually crafted combinatorial features". In: *Proceedings of the 22nd ACM SIGKDD international conference on knowledge discovery and data mining*. ACM. 2016, pp. 255–262.

Deep Crossing

Scoring layer

- ▶ objective: logloss
- ▶ sigmoid/softmax

Embedding layer

高维稀疏特征 (id 类, one-hot encode) → 低维稠密特征

$$\mathbf{W}_j : (m_j \times n_j), \quad m_j < n_j$$

ReLU

$$X_j^o = \max(\mathbf{0}, \mathbf{W}_j X_j^I + \mathbf{b}_j)$$

Deep Crossing

Stacking layer

concatenate: $X^O = [X_0^O, X_1^O, \dots, X_K^O]$

Residual layer

2 layers ReLU transform

$$X^O = \mathcal{F}(X^I, \{\mathbf{W}_0, \mathbf{W}_1\}, \{\mathbf{b}_0, \mathbf{b}_1\}) + X^I$$

