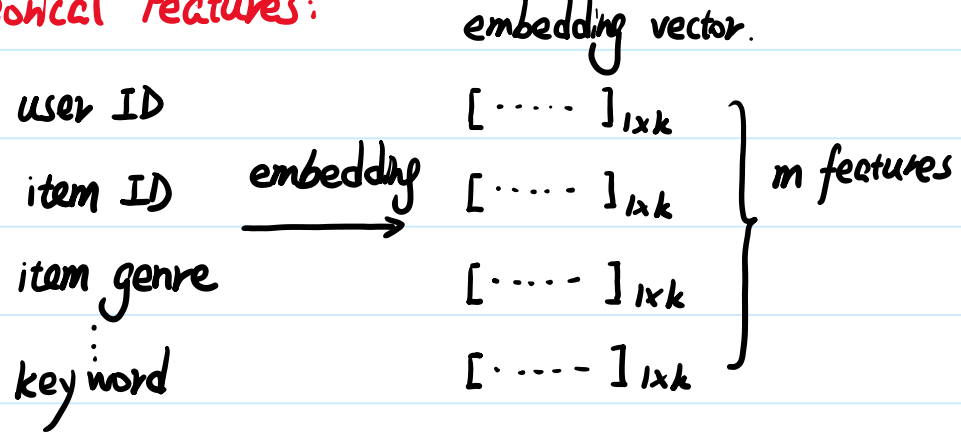
SENet

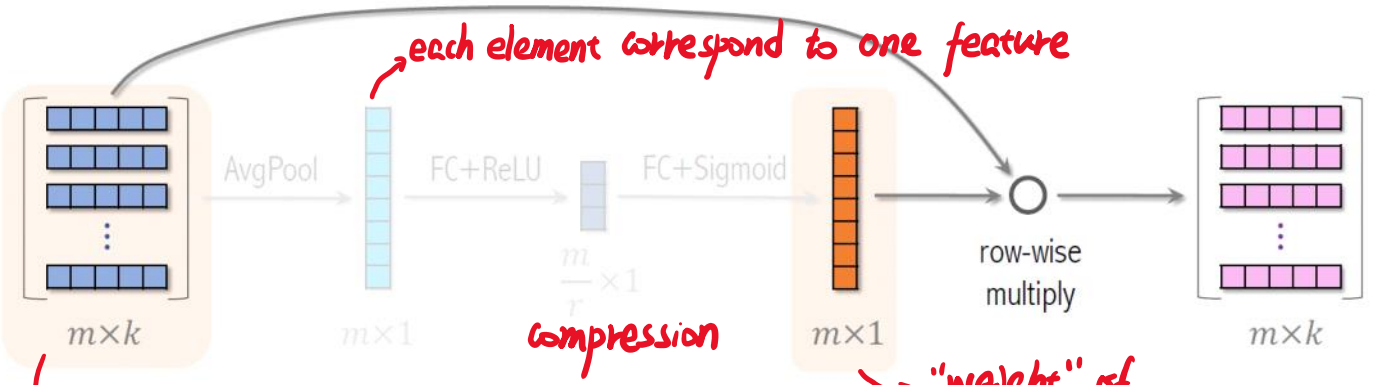
Tuesday, April 9, 2024 9:11 AM

SENet: from computer vision;
can be used in recommender system.

Categorical Features:



Structure:



(Picture from Shusen Wang on Bilibili)

Feature Cross

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embedding

Example: item location ⟶ [· · · · · · · ·]

user location ⟶ [· · · · · · · ·]

feature cross.

Inner Product:

$$f_{i,j} = \vec{x}_i^T \cdot \vec{x}_j$$

$1 \times 1 \quad 1 \times k \quad k \times 1$

m^2 scalars = m field $\times$ m field

Hadmard Product:

$$\vec{f}_{ij} = \vec{x}_i \cdot \vec{x}_j$$

$1 \times k \quad 1 \times k \quad 1 \times k$

m^2 vectors = m fields $\times$ m fields

Bilinear Cross (inner product)

$$f_{ij} = \vec{x}_i^T \cdot W_{ij} \cdot \vec{x}_j$$

$1 \times 1 \quad 1 \times k \quad k \times k \quad k \times 1$

m fields ⟶ $m^2/2$ matrices for W

Feature Cross

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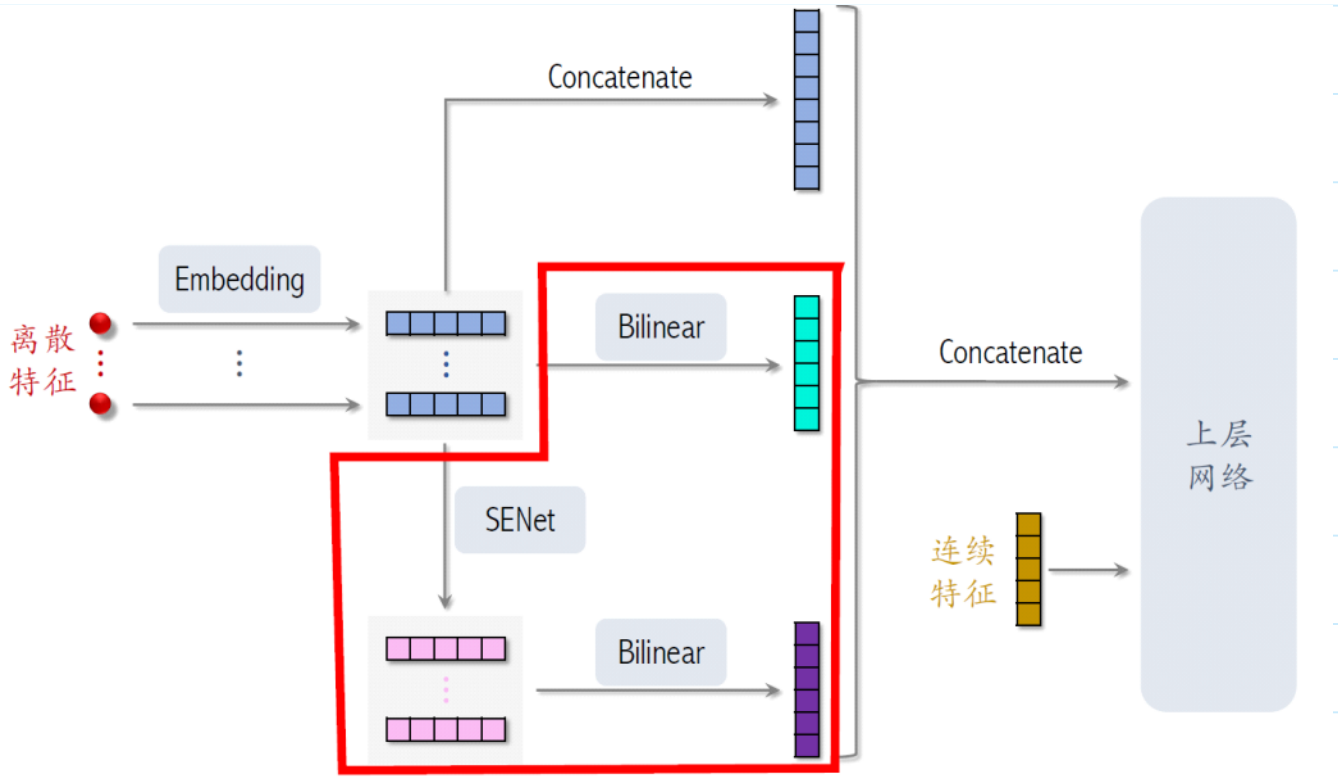
Bilinear Cross (Hadmard)

$$\underset{k\times 1}{\vec{f}_{ij}} = \underset{k\times 1}{\vec{x}_i} \circ \left(\underset{k\times k}{w_{ij}} \cdot \underset{k\times 1}{\vec{x}_j} \right)$$

Hadmard

m fields → m^2 vectors.

SENet + Bilinear Cross → FiBiNet



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