COURIER: Contrastive User Intention Reconstruction for Large-Scale Visual Recommendation

Jia-Qi YANG, Chenglei DAI, Dan OU, Dongshuai LI, Ju HUANG, De-Chuan ZHAN, Xiaoyi ZENG, Yang YANG

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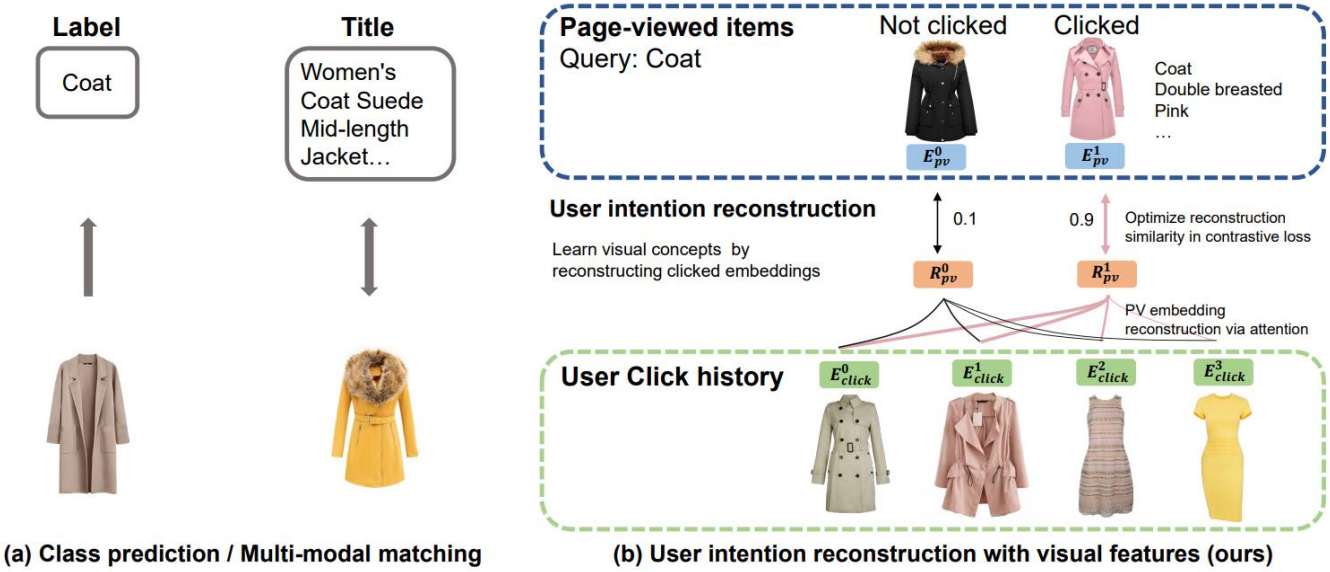
Problems & Ideas

- Problems of existing image feature learning methods:
  - User preferences for visual appearance tend to be vague and imprecise, which may not be captured by existing image feature learning methods that focus on label prediction.
  - The label information embedded in the pre-trained embeddings is redundant.
- Ideas: An item clicked by a user is likely to have visual characteristics similar to some of the clicking history items.



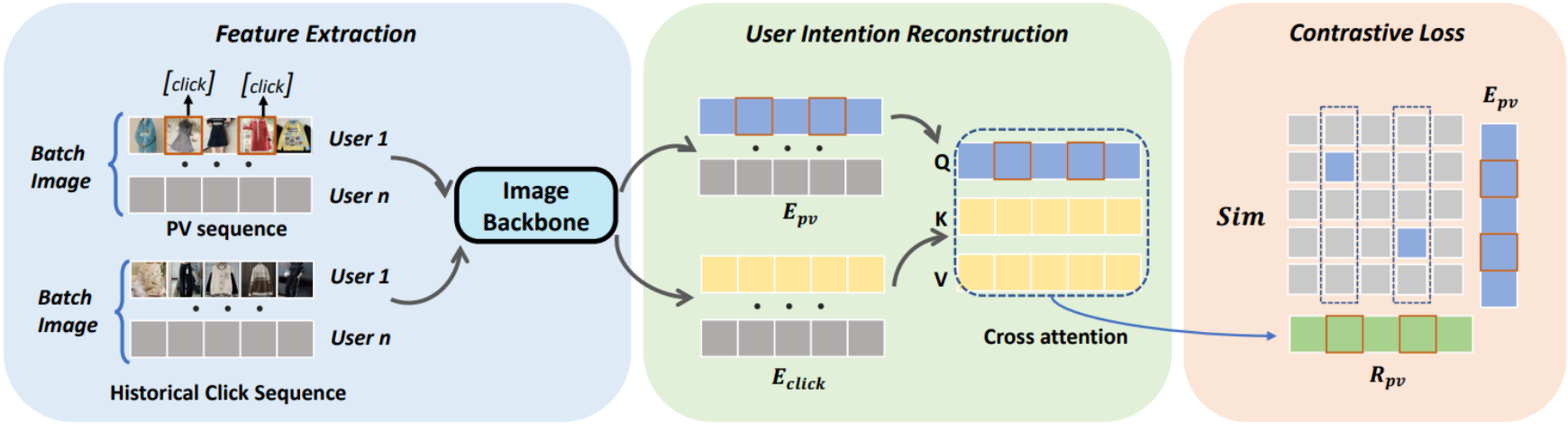
(a) Class prediction / Multi-modal matching

(b) User intention reconstruction with visual features (ours)

(a) Existing image feature learning methods are tailored for cross-modal prediction tasks. (b) We propose a user intention reconstruction method to mine potential visual features that cannot be reflected by cross-modal labels.

Main Contributions

- Contributions:
  - We propose a user intention reconstruction method, which can mine latent user intention from history click sequences without any explicit semantic labels;
  - The user intention reconstruction objective alone may lead to a collapsed solution. To solve this problem, we propose a contrastive training method that utilizes the un-clicked item efficiently;
  - We conduct comprehensive experiments on both private and public datasets to validate the effectiveness of our method. Additionally, we provide insights and share our practical experience regarding the deployment of image feature models in real-world large-scale recommendation systems.



The contrastive user intention reconstruction method. The images are fed into the image backbone model to obtain the corresponding embeddings. The embeddings of PV (Page-View) sequences are blue-colored, and the embeddings of click sequences are yellow-colored. The reconstructions are in green. Red boxes denote positive PV items.