Exploring deep learning for intelligent image retrieval
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Propositions

pertaining to the thesis

Exploring Deep Learning for Intelligent Image Retrieval

by Wei Chen

1. Although deep neural networks have been a powerful feature learner to perform image retrieval, their learning ability cannot always achieve good performance on all image retrieval tasks [This thesis, Chapter 2].

2. Instance-level retrieval is an important sub-task of content-based image retrieval, and more challenging than category-level retrieval. More accurate data annotations make instance-level retrieval less challenging [This thesis, Chapter 2].

3. Retrieval accuracy and retrieval efficiency are two important criteria, for which most methods need to make a trade-off [This thesis, Chapter 2 & 3].

4. Cross-modal retrieval concerns semantic associations between image features and text features within a shared feature space. Learning a better shared feature space is beneficial for multimodal tasks [This thesis, Chapter 3, 4, & 8].

5. Exploring lifelong image retrieval with less forgetting is an important task on the path to realizing intelligent image retrieval [This thesis, Chapter 5, 6 & 7].

6. In terms of reducing forgetting, the incremental image retrieval task is more difficult than the incremental image classification task [This thesis, Chapter 5, 6 & 7].

7. Deep neural networks, trained as black boxes, are able to learn powerful features for retrieval. In most cases, we pay only attention to the final retrieval performance. It often lacks a clear explanation of what kind of features a neural network has learned.

8. Deep learning methods still heavily depend on training data. They perform well on several specific data sets but lack good generalization for other datasets. The explainability of deep features may be helpful to understand in what cases these deep learning methods do not work.

9. Training deep neural networks is similar to training our brains. With more data learned, we understand more.

10. A PhD study is a journey. In this journey, question is a teacher and trouble is a friend.