# DeepSSH: Deep Semantic Structured Hashing For Explainable Person Re-identification

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Introduction:

➤ Existing hashing based re-id approaches fail to provide semantically explainable, which makes it infeasible to identify the correct matches in the collection by just using a semantic query.

➤ we propose a new deep hashing network called Deep Semantic Structured Hashing (DeepSSH) to obtain the semantic structured representation of human.

➤ In the proposed DeepSSH framework, both the mid-level human attributes and the high-level ID labels are used to learn a deep hashing network. Then, a decoder is learnt to find the partial hash code corresponding to the specified attributes. Finally, a new grain scalable re-id framework is constructed to support semantic query of a person by providing partial or full semantic description of a person instead of the whole photo.
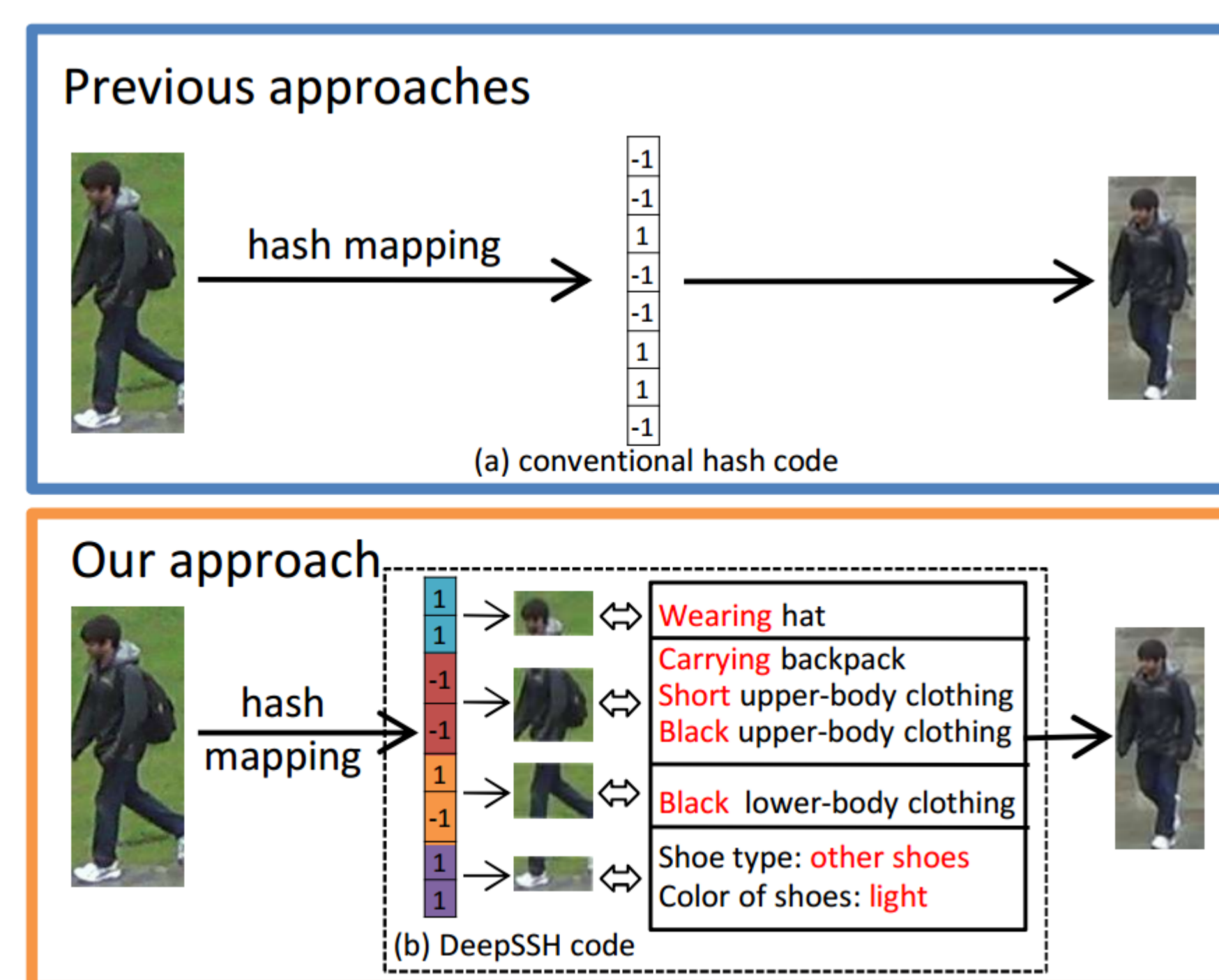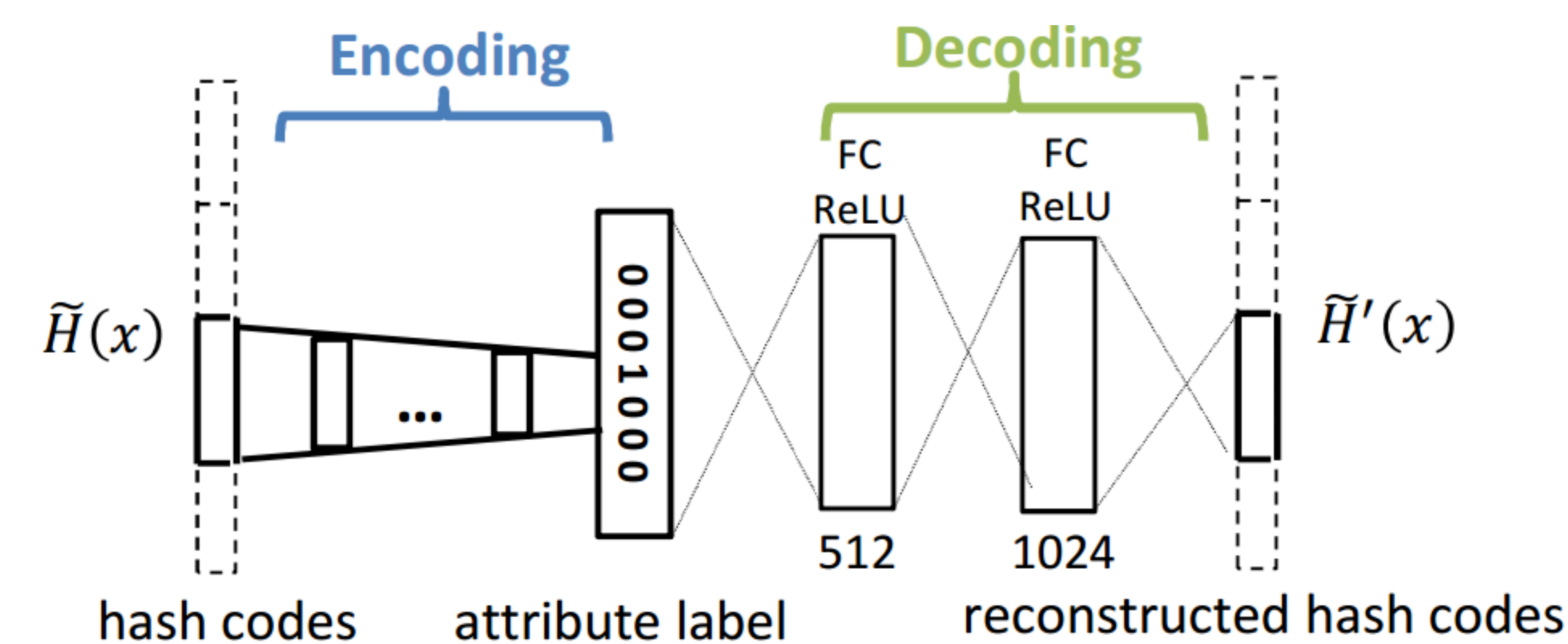

➤ Experiments show that DeepSSH is comparable with state-of-the-art approaches, and the experiment in semantic analysis shows that our hash code owns semantic meaning indeed.
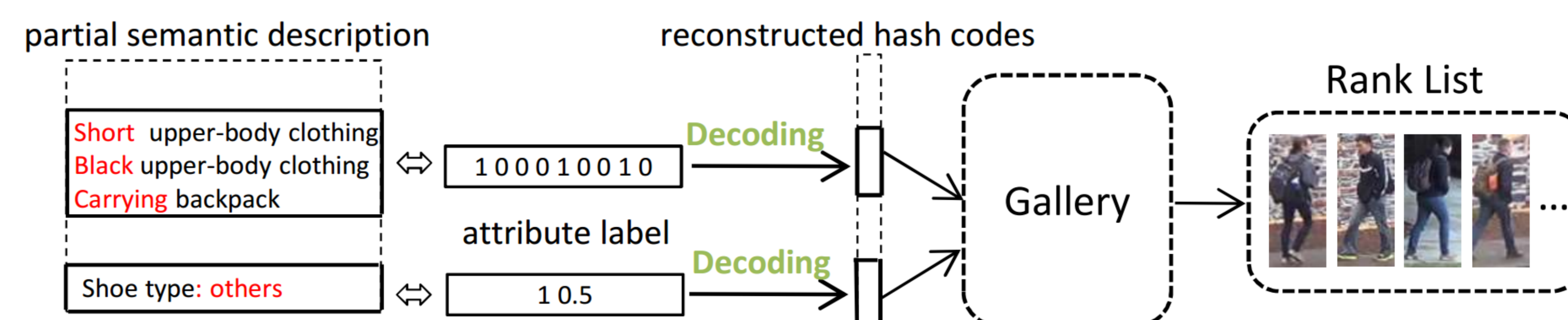
Model:

➤ The overview of the DeepSSH model for large-scale person re-id.
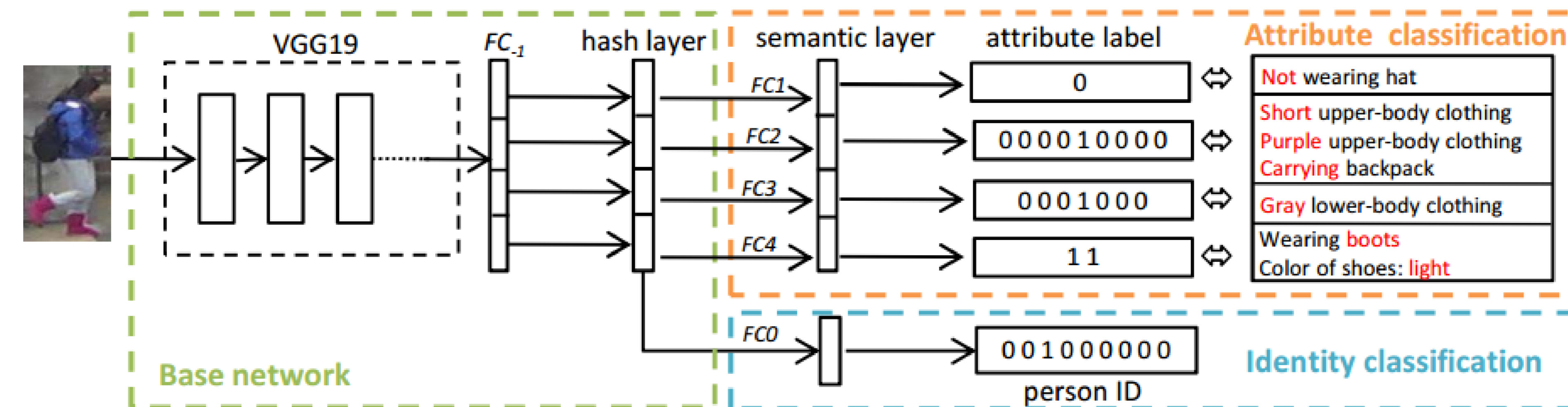
➤ Illustration of the decoder. Decoder is used to get the transformation from attribute label to the hash code.
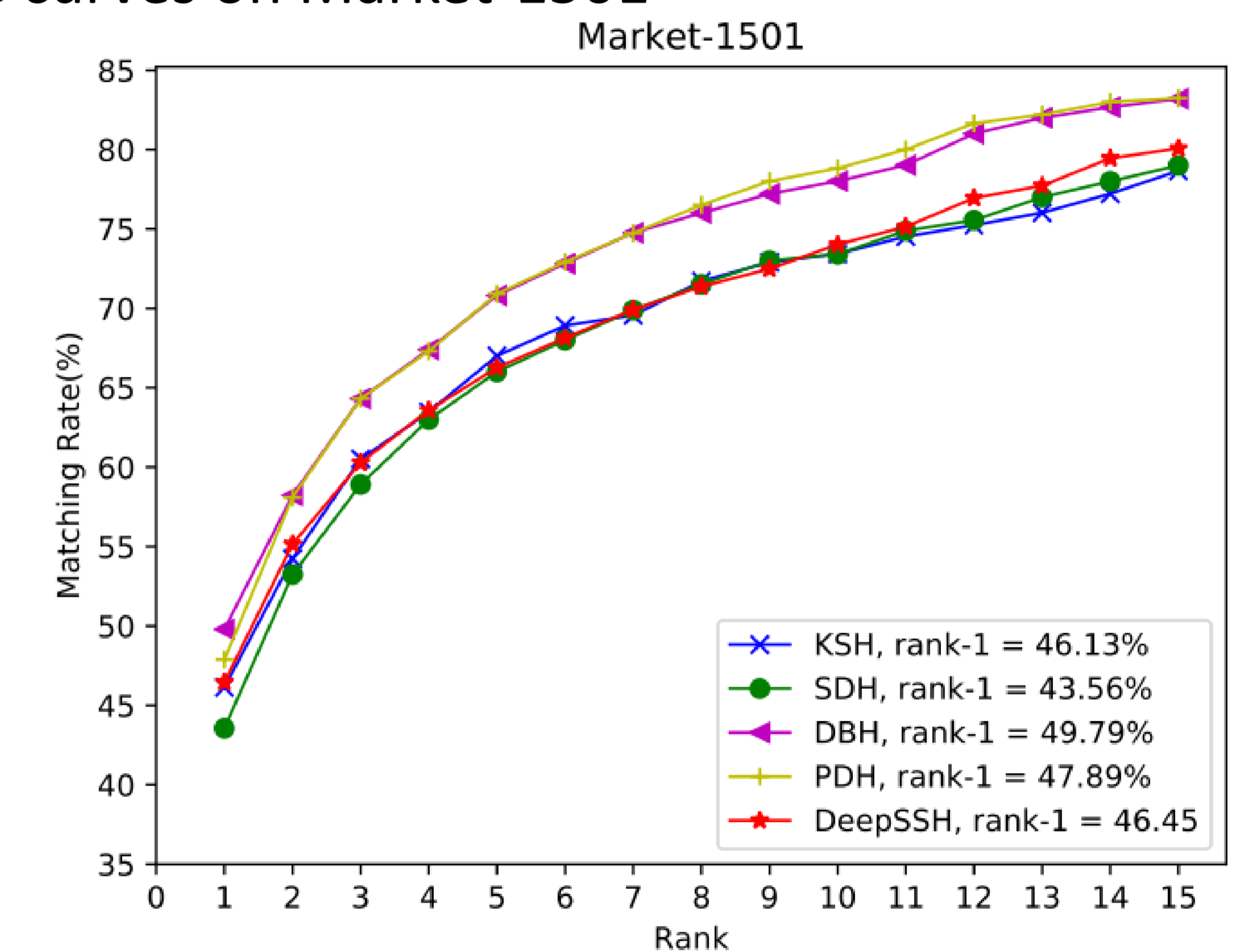

➤ Illustration of the semantic query.

Experiments:

➤ mAP (%) comparison with different hash codes lengths on Market-1501

methods	128 bits	256 bits	512 bits	1024 bits	2048 bits
KSH-CNN	20.62	23.40	24.41	24.90	25.01
SDH-CNN	17.82	20.59	21.93	22.28	23.19
DBH	4.89	10.01	16.39	24.14	30.29
PDH	19.59	22.42	24.30	26.09	26.06
DeepSSH	17.85	22.36	24.13	27.226	27.23

➤ CMC curves on Market-1501

➤ Rank-1 and Rank-5 accuracy when using different number attributes to do the query