

Institutskolloquium

Thema: **Concept-Based Image Retrieval Using Stochastic String Segmentations**

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Abstract:

We present a method for concept-based medical image retrieval. A concept is conceived of as an incremental and interactive formalization of the user's conception of an object in an image. The premise is that such a concept is closely related to a user's specific preferences and subjectivity and thus allows to deal with the complexity and content-dependency of medical image content. We describe an object in terms of multiple continuous boundary features, i.e. strings, and represent an object concept by the stochastic characteristics of an object population. A population-based incrementally learning technique, in combination with relevance feedback, is then used for concept customization. The user determines the speed and direction of concept customization using a single parameter that defines the degree of exploration and exploitation of the search space. Images are retrieved from a database in a limited number of steps based upon the customized concept. To demonstrate our method we have performed concept-based image retrieval on a database of 293 digitized X-ray images of cervical vertebrae with a variety of abnormalities. The results show that our method produces precise and accurate results when doing a direct search. In an open-ended search our method efficiently and effectively explores the search space.



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