Explainable Query Refinement and Overhead Imagery Analytics

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Image and video exploitation tools are improving with advances in deep learning where better object detectors, classifiers, and related capabilities are benefiting. Most of the deep learning approaches benefit from a large volume of labeled training data, which might not always be available in a certain domain. For instance, in overhead imagery, it can be challenging to collect a large amount of labeled data for a variety of object types. Furthermore, users exploiting overhead and related imagery are usually interested in a variety of different objects or structures. Their exemplar image queries for image search can vary significantly and can be challenging when the emphasis is on a small part of the query image. We are developing methods to address these challenges with interactive query refinement, and explainability of matches with saliency maps and captions. We will also discuss various related techniques being developed to identify relevant parts of the overhead imagery through object detection, object-level change detection, pattern matching, and image forensics.