

Context, Computation, and Optimal ROC Performance in Hierarchical Models

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Introduction

- human vision relies on contextual information
- example: don't get meaning of a single word, but understand it in a full sentence.
- example: the kuleshov effect with an expressionless face between different situation.
- idea: start from local features like edges and continuing to high-level knowledge.

Matching Templates vs. matching Parts

Same Section but another slide

Conclusion

- nearly optimal detection rate ...
 - for a sequence of local tests for the parts of an object in a high-resolution limit.
 - if tests are ordered by local cond. probabilities of the parts
- dilemma:
 - **when** is a object present and **when** it is absent?
 - absent, if there is nothing which resembles the object.
 - false detection.
- solution: objects are made of components of other objects
- hierarchical model for objects in terms of its parts and subparts
- extrem efficient with sequential testing of components (coarse-to-fine search)

Conclusion

- two ways to explore posterior distribution:
 - integration with focus for present objects.
 - identify specific instantiations of objects which are sufficiently likely.
- best strategy: mixture of both. integrate low-level variables but look for specific instantiations of high-level variables.
- but: right computation is much architecture and application specific!