A Visual Latent Semantic Approach for Automatic Analysis and Interpretation of Anaplastic Medulloblastoma Virtual Slides

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Medulloblastoma Tumor Classification Problem

- Medulloblastoma (MB) is one of the most common types of malignant brain tumors (25% of all brain tumors in children).
- Tumor classification of MB is always performed by microscopical examination.
- Different histology types of MB have different prognosis. Anaplastic type is the worst!

Methodology

a) Bag of Feature Image Representation

b) Probabilistic Visual Latent Semantic Image Analysis

ALGORITHM

Training
1. Estimate P(VW|LF)
2. Estimate P(C|LF)

Prediction
1. Estimate P(LF|I*)
2. Estimate P(C|I*)

Experimental Evaluation

a) Visual mapping and interpretation

b) Classification Performance

- 7500 images (200 x 200 pixels)
- 10 cases (5 A:anaplastic, 5 NA:non-anaplastic)
- Multiple trials of cross-validation

CONCLUSIONS

- Good classification performance in a challenging task.
- Visual interpretability.

REFERENCES