

Processing of three-dimensional medical data using computer vision methods

Following changes of the brain tumors in regular MRI examinations

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MOTIVATION

- saving valuable time of doctors
- automatization and simplification of the monotonous work

USAGE

- clinical practice: treatment planning diagnostics
- education

PREPROCESSING

GOAL:
contrast and brightness adjustment

METHOD:
based on the data scaling and histogram matching

RIGID REGISTRATION

GOAL:
alignment of the fusions captured at the different examinations

METHOD:
based on the keypoint detection, feature extraction and feature matching

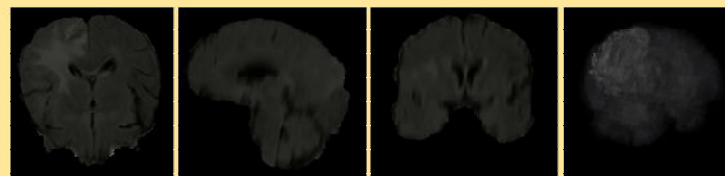
NONRIGID REGISTRATION

GOAL:
tumor changes monitoring

METHOD:
based on the dense optical flow

VISUALIZATION

- image morphing
- visualization tool with 2D views and 3D model

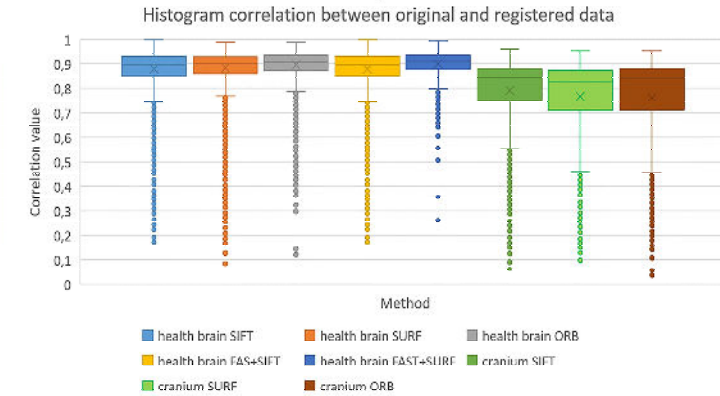


RESULTS and CONCLUSION

Evaluation is based on the comparison of histogram correlation between input and registered data.

RIGID REGISTRATION

Different algorithms were evaluated on the dataset from practice.



NONRIGID REGISTRATION

Effect of the different modalities was evaluated on the BRATS dataset.

