



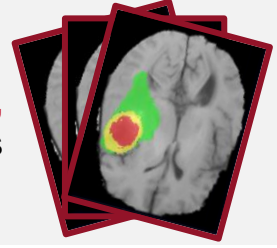
# Abstract: Generation of Annotated Brain Tumor MRIs with Tumor-induced Tissue Deformations for Training and Assessment of Neural Networks

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## Currently available data



**Anatomical**  
labels, but no pathology

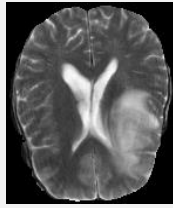


**Pathological,**  
but no anatomical labels

sketch+tumor

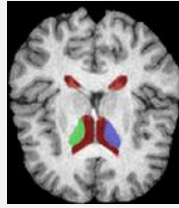


appearance



Train  
Test

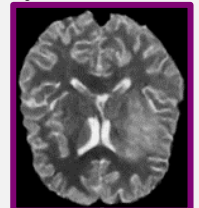
topology



sketch+tumor



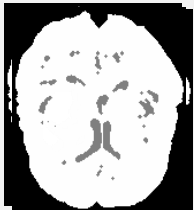
injected tumor



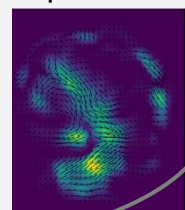
Brain tumor MRIs with **anatomical** and **pathological** labels

**Tumor-induced deformations** with a novel **inverse** approach

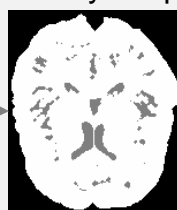
synth. deform.



displacement

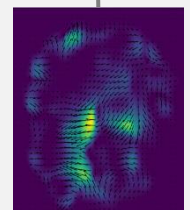


healthy shape



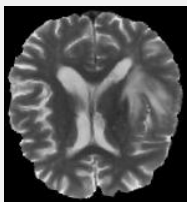
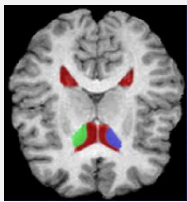
Train  
Test

real shape

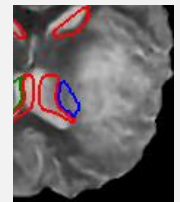
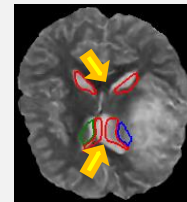
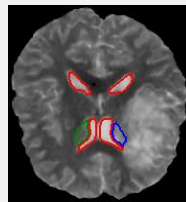
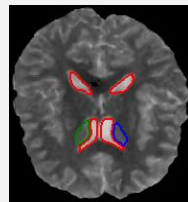
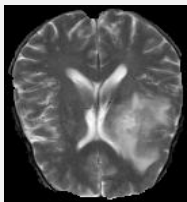
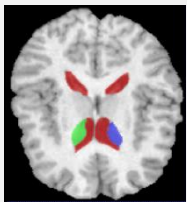
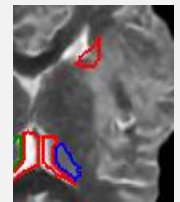
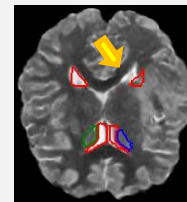
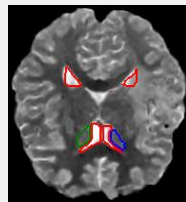
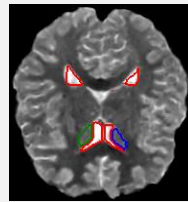


invert  
and  
warp

## Results:



Real  
Generated



healthy

tumor

no tumor

tumor, no def

tumor, with def.

## Applications of generated data:

1. Evaluation of standard methods: registration NN pre-trained
  2. Training of NNs for pathological data
- **Tumor-induced deformation simulation is crucial!**

Original  
MICCAI  
publication!

