Deformation of GTV to Other BP

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umcg

General Problem & Aim

Problem: Lung and tumor radiomics for single breathing Phase CTs are inaccessible if only one GTV is delineated on the 4D CT.

Overarching aim: Use the delineated GTV and deform it to a specific breathing phase CT.

Sub-aim of this project: Generate a method that delivers translational metrics on how good the registratration is.

Elevator pitch

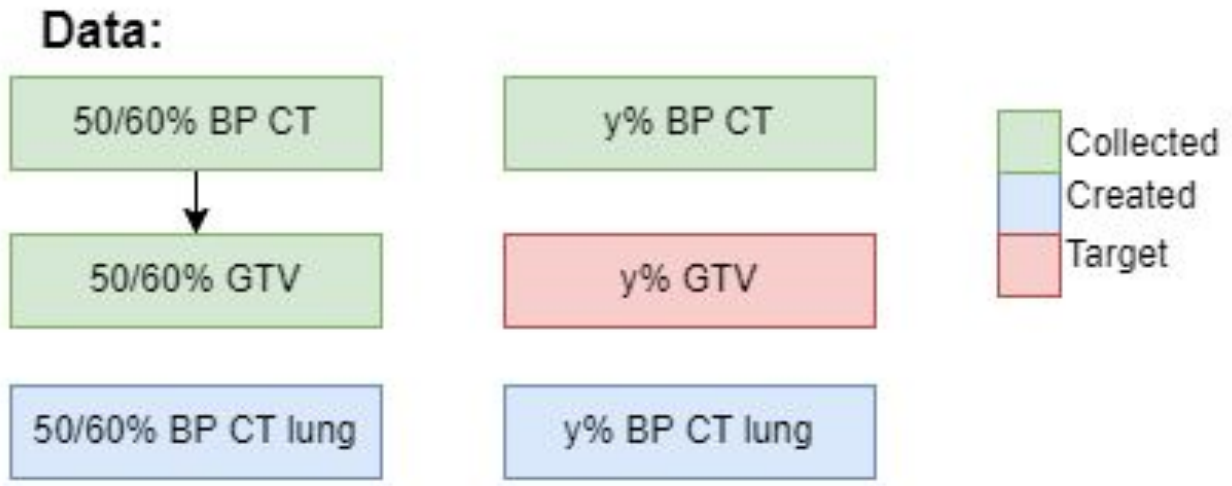
- Deform the delineated GTV contour to a different breathing phase CT

Recap from last meeting

- Assumptions:
  - GTV is delineated either on the 50% or 60%.
  - Other BP CT does not contain any GTV information.
  - Deformable registration have the complexity to adapt the contours.

Available data

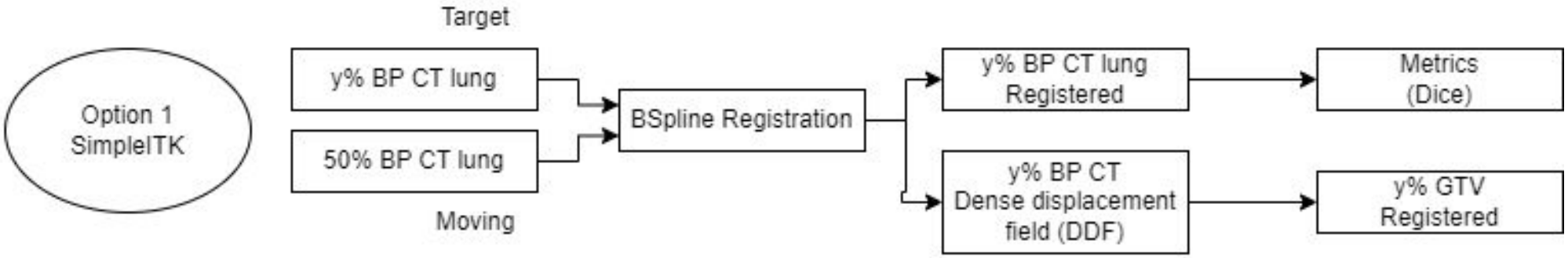
- Data available:
  - Lung Mask Created with [1]



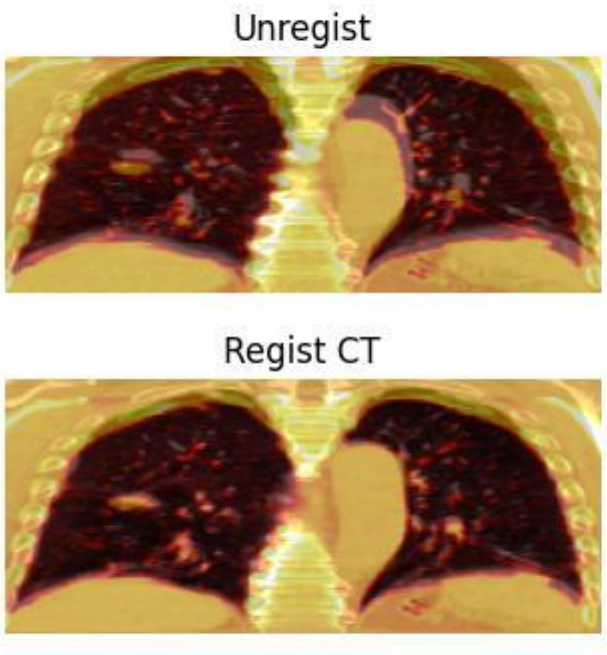
[1] https://github.com/JoHof/lungmask

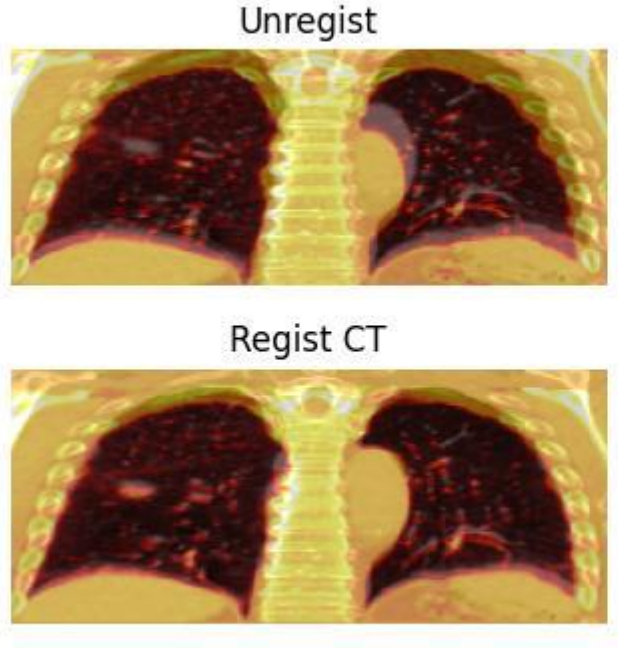
Result from last week

- Possible Methods:
  - Option 1: Selected Method



Problem Visualization

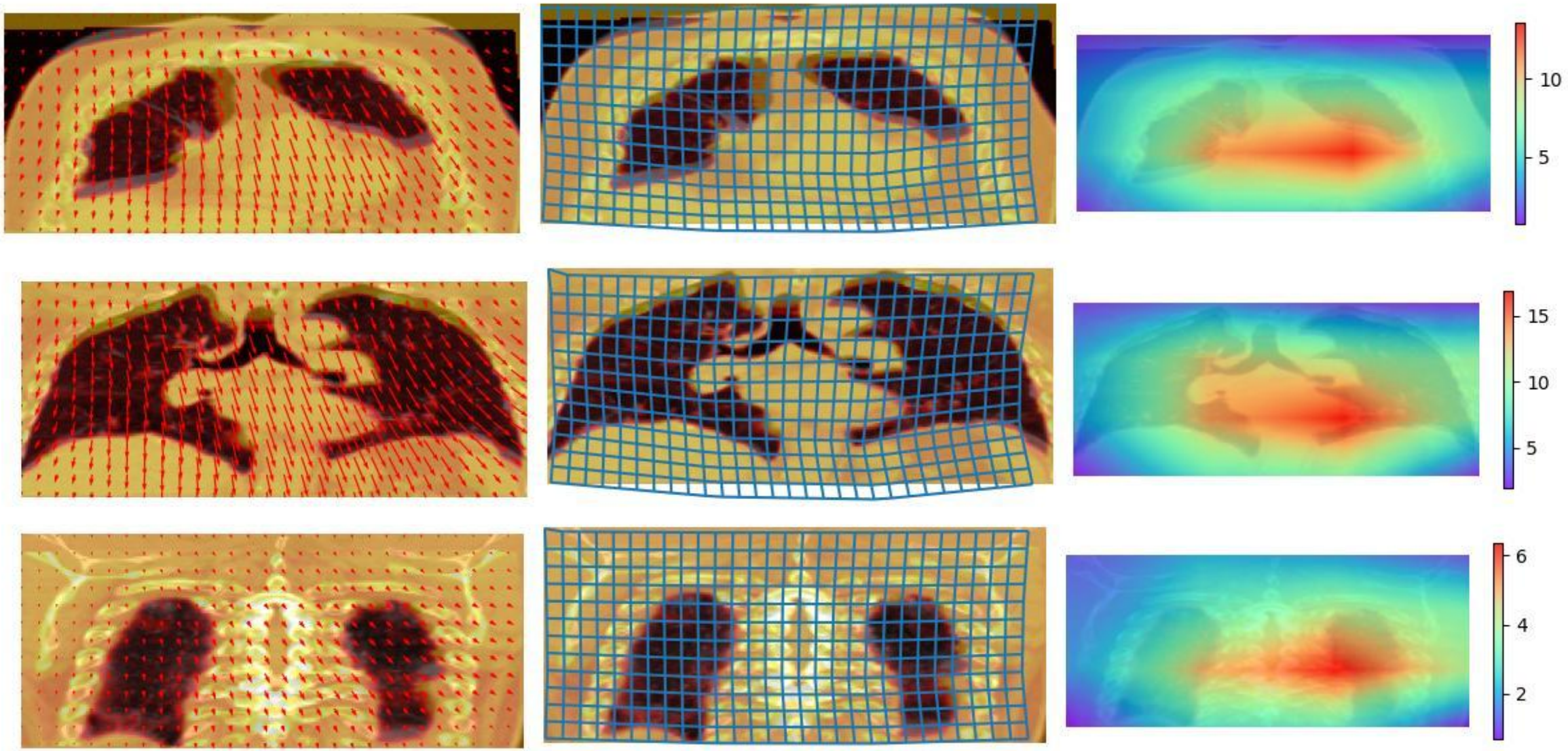




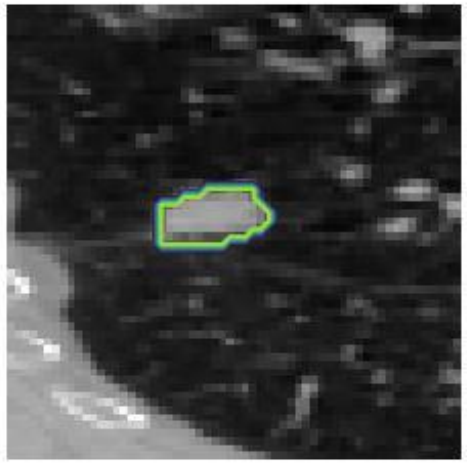
Top: Overlap of 50% CT and 0% CT, unregistered
Bottom: Overlap of 50% and 0% registered using 0% CT images as fixed image

Same patient, different slide

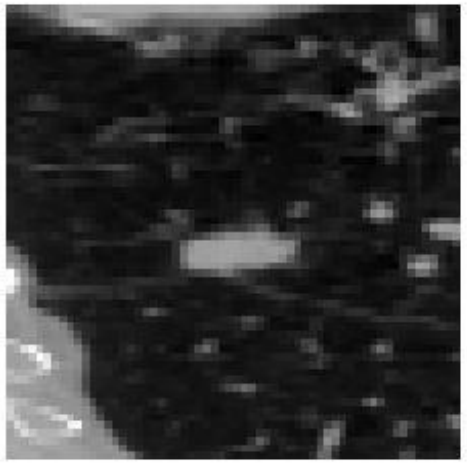
Deformation maps



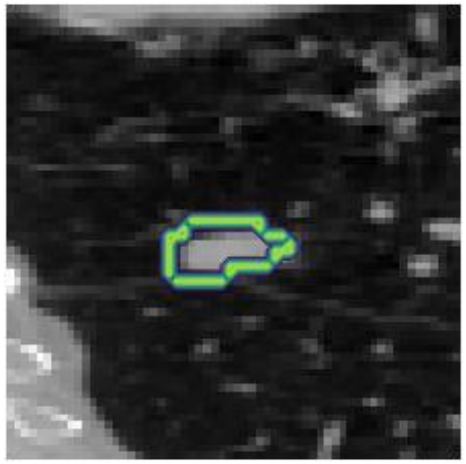
GTV registered



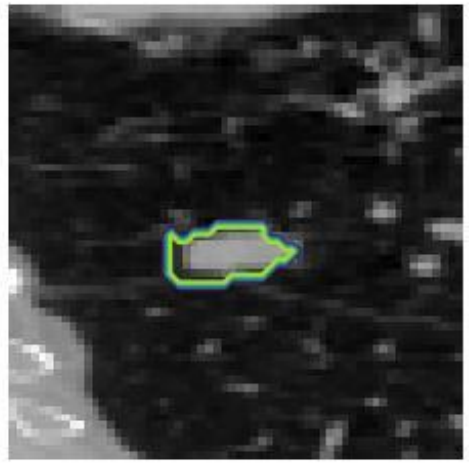
50%Ct with 50% GTV



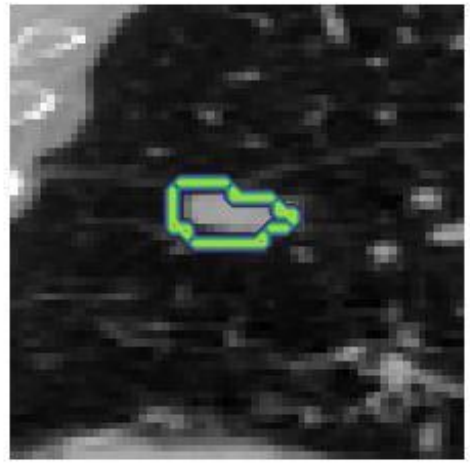
0% CT



0% CT with 0% GTV Regist with LM



0% CT with 0% GTV Regist with CT



0% CT with 0% GTV Regist with LC

All images are in coronal view

GTV registered

- Expected metrics *

	Lung Mask (LM)	CT	Lung Contour (LC)
Dice GTV Overlap			

** Waiting for database to test algorithm*