EXERCISES

MULTI-MODAL IMAGE INTEGRATION AND ORGAN MOTION MANAGEMENT

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The Abdus Salam International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

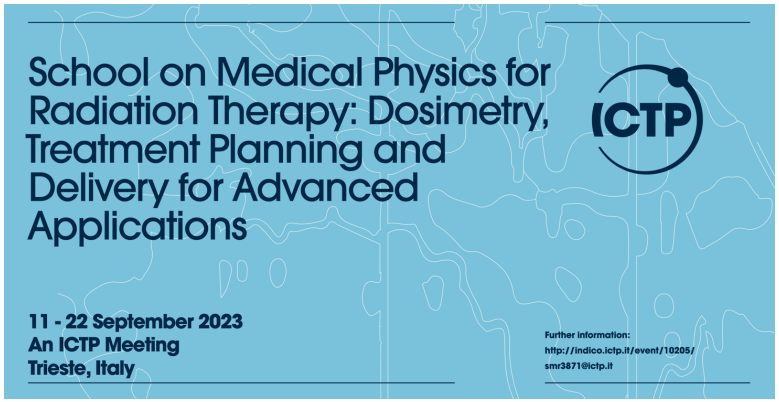

IMAGE REGISTRATION – rigid and global

Head and neck – cervical region not aligned between CT and MR (different patient position)
use patient "encefalo trieste1_*"

1. align volumes automatically and comment results in the hypothesis of target located
    a. in the frontal lobes
    b. in the inferior half of the CT scan (cervical spine)
2. correct the registration manually for case 1b. - then use region-based registration (“focus on region”) on brain stem and spinal cord (cervical)
3. evaluate difference in pitch rotation in the two cases
4. try manual or point-based registration and comment on results

IMAGE REGISTRATION – deformable

(same case as previous – *to be performed if time left only*)

1. perform deformable image registration instead of rigid registration

2. compare results with the automatic rigid registrations already performed

3. comment on issues introduced by DIR compared to rigid registration

USE of 4DCT to build ITV in a motion-encompassing technique

lung 4DCT series - 9-phase gating

use patient "lung 4DCT trieste1_*"

1. identify maximum expiration and inspiration phases and draw contours on lung nodule to represent GTV
2. draw contours in the other 7 intermediate phases also and build the ITV from the 9 phases (add margin: 10 mm SI / 7 mm AP / 5 mm LR)
3. measure the volume of the ITV
4. build maximum CT and draw contour - build ITV (same margins)
5. compare the two ITV volumes
6. when done, compare the volumes between groups
7. build average volume to use for planning

LOGIN INSTRUCTIONS

USERS: ictp1, ictp2, …, ictp15

PWD: dDf(NxOEm=EL

PWD2: ICTP2023

access valid from 14 Sept through 22 Sept 12:00 – 19:00