

# Synthetic and Phantom MR Images for Determining Deformable Image Registration Accuracy (MRI-DIR)

## Summary




Two sets of images were created to evaluate deformable image registration accuracy. The first set contains CT, T1-, and T2-weighted images from a porcine phantom. The phantom was implanted with ten 0.35 mm gold markers and then immobilized in a plastic container with movable dividers. The porcine phantom was compressed in 4 different ways and images were acquired in each position. The markers were visible on the CT scans but not the MR scans due to the selected voxel size. Therefore, the markers do not interfere with the registration between MR images and the marker locations can be obtained from the CT images to determine accuracy. The second set of images are synthetic images derived from 28 head and neck squamous cell carcinoma patients who had pre-, mid-, and post-radiotherapy treatment MR scans. From these patients, inter- and intra-patient models were created. Four synthetic pre-treatment images were created by using the inter-patient model on a selected template patient. Four synthetic post-treatment images were created for each synthetic pre-treatment image using the intra-patient model.

Rachel B. Ger, Jinzhong Yang, Yao Ding, Megan C. Jacobsen, Carlos E. Cardenas, Clifton D. Fuller, Rebecca M. Howell, Heng Li, R. Jason Stafford, Shouhao Zhou, Laurence E. Court

### Data Access

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Click the **Download** button to save a ".tcia" manifest file to your computer, which you must open with the [NBIA Data Retriever](#). Click the **Search** button to open our Data Portal, where you can browse the data collection and/or download a subset of its contents.

Data Type	Download all or Query/Filter
Images and Radiation Therapy Structures (DICOM, 1.4 GB)	 
Deformation Vector Fields (MATLAB)	

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### Detailed Description

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Collection Statistics	
Modalities	CT, MR, RTSTRUCT, Matlab
Number of Participants	9
Number of Studies	25
Number of Series	61
Number of Images	3596
Image Size (GB)	1.4

## Supporting Documentation

Rachel B. Ger, Jinzhong Yang, Yao Ding, Megan C. Jacobsen, Carlos E. Cardenas, Clifton D. Fuller, Rebecca M. Howell, Heng Li, R. Jason Stafford, Shouhao Zhou, Laurence E. Court. (2018) **Synthetic head and neck and phantom images for determining deformable image registration accuracy in magnetic resonance imaging**. Medical Physics. DOI: [10.1002/mp.13090](https://doi.org/10.1002/mp.13090)

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Rachel B. Ger, Jinzhong Yang, Yao Ding, Megan C. Jacobsen, Carlos E. Cardenas, Clifton D. Fuller, Rebecca M. Howell, Heng Li, R. Jason Stafford, Shouhao Zhou, Laurence E. Court (2018). **Data from Synthetic and Phantom MR Images for Determining Deformable Image Registration Accuracy (MRI-DIR)**. The Cancer Imaging Archive. DOI: [10.7937/K9/TCIA.2018.3f08iejt](https://doi.org/10.7937/K9/TCIA.2018.3f08iejt)

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#### TCIA Citation



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### Versions

#### Version 1 (Current): Updated 2018/06/30

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Deformation Vector Fields (MATLAB)	