

Fused Radiology-Pathology Prostate Dataset (Prostate Fused-MRI-Pathology)

Summary

Redirection Notice

This page will redirect to <https://www.cancerimagingarchive.net/collection/prostate-fused-mri-pathology/> in about 5 seconds.

This collection comprises a total of 28 3 Tesla T1-weighted, T2-weighted, Diffusion weighted and Dynamic Contrast Enhanced prostate MRI along with accompanying digitized histopathology (H&E stained) images of corresponding radical prostatectomy specimens. The MRI scans also have a mapping of extent of prostate cancer on them [10.1002/jmri.24975]. Each surgically excised prostate specimen was originally sectioned and quartered resulting in 4 slides for each section. Each of these individual slides was digitized at 20x magnification using an Aperio slide scanner resulting in a set of 4 .svs images. Each of the 4 .svs images were then digitally stitched together to constitute a pseudo-whole mount section (.tiff) using the program in [PMCID: PMC4023035]. Annotations of cancer presence on the pseudo-whole mount sections were made by an expert pathologist. Slice correspondences were established between the individual T2w MRI and stitched pseudo-whole mount sections by the program in [10.1016/j.compmedimag.2010.12.003] and checked for accuracy by an expert pathologist and radiologist. Deformable co-registration [PMC3078156] was employed to spatially co-registered the corresponding radiologic and histopathologic tissue sections to map disease extent onto the corresponding MRI scans.

Acknowledgement

- Data collection and analysis was provided by Anant Madabhushi, PhD, Case Western Reserve University and Michael D. Feldman, MD, PhD, Hospital at the University of Pennsylvania.
- This work was supported by NIH R01CA136535.

Data Access

Data Access

Data Type	Download all or Query/Filter	License
Images (DICOM, 4.4 GB)	Download Search (Download requires the NBIA Data Retriever)	CC BY 3.0
Annotated Whole Slide Pathology Images & Annotations (Tiff, XML 76.8 GB)	Download Search (Download and apply the IBM-Aspera-Connect plugin to your browser to retrieve this faspex package)	CC BY 3.0
Fused Rad-Path Matlab Files (zip, 65 kB)	Download	CC BY 3.0
Correspondence tables (XLSX, 22 kB)	Download	CC BY 3.0

Click the Versions tab for more info about data releases.

Additional Resources for this Dataset

The NCI Cancer Research Data Commons (CRDC) provides access to additional data and a cloud-based data science infrastructure that connects data sets with analytics tools to allow users to share, integrate, analyze, and visualize cancer research data.

- [Imaging Data Commons \(IDC\)](#) (Imaging Data)

Detailed Description

Detailed Description

Collection Statistics	Radiology Image Statistics	Pathology Image Statistics
Modalities	MRI	Pathology, Matlab
Number of Participants	28	16
Number of Studies	28	N/A
Number of Series	324	N/A
Number of Images	32,508	114
Image Size (GB)	4.4	76.8

Supporting Documentation

The data set is fully described in the following publications:

1. Singanamalli, A. , Rusu, M. , Sparks, R. E., Shih, N. N., Ziober, A. , Wang, L. , Tomaszewski, J. , Rosen, M. , Feldman, M. and Madabhushi, A. (2016), **Identifying in vivo DCE MRI markers associated with microvessel architecture and gleason grades of prostate cancer.** J. Magn. Reson. Imaging, 43: 149-158. doi: <https://doi.org/10.1002/jmri.24975> (PMID:26110513).
2. Toth, R, Feldman, M, Yu, D, Tomaszewski, J, Madabhushi, A, **“Histostitcher™: An Informatics Software Platform for Reconstructing Whole-Mount Prostate Histology using the Extensible Imaging Platform (XIP™) Framework,”** Journal of Pathology Informatics, vol. 5, pg. 8, 2014 (PMID: 24843820, PMCID: PMC4023035). <https://doi.org/10.4103/2153-3539.129441>
3. Xiao, G, Bloch, N, Chappelow, J, Genega, E, Rofsky, N, Lenkinsky, R, Tomaszewski, J, Feldman, M, Rosen, M, Madabhushi, A, **“Determining Histology-MRI Slice Correspondences for Defining MRI-based Disease Signatures of Prostate Cancer,”** Special Issue of Computerized Medical Imaging and Graphics on Whole Slide Microscopic Image Processing, vol. 35[7-8], pp. 568-78, 2011 (PMID: 21255974). <https://doi.org/10.1016/j.compmedimag.2010.12.003>
4. Chappelow, J, Bloch, N., Rofsky, N, Genega, E, Lenkinski, R, DeWolf, W, Madabhushi, A, **“Elastic Registration of Multimodal Prostate MRI and Histology via Multi-Attribute Combined Mutual Information,”** Medical Physics, vol. 38[4], pp. 2005-2018, 2011 (PMID: 21626933). <https://doi.org/10.1118/1.3560879>

Citations & Data Usage Policy

Citations & Data Usage Policy

Users must abide by the [TCIA Data Usage Policy and Restrictions](#). Attribution should include references to the following citations:

i Data Citation

Madabhushi, A., & Feldman, M. (2016). **Fused Radiology-Pathology Prostate Dataset (Prostate Fused-MRI-Pathology)**. The Cancer Imaging Archive. doi; [10.7937/k9/TCIA.2016.tlpmr1am](https://doi.org/10.7937/k9/TCIA.2016.tlpmr1am)

i Publication Citation

Singanamalli, A. , Rusu, M. , Sparks, R. E., Shih, N. N., Ziober, A. , Wang, L. , Tomaszewski, J. , Rosen, M. , Feldman, M. and Madabhushi, A. (2016), **Identifying in vivo DCE MRI markers associated with microvessel architecture and gleason grades of prostate cancer**. J. Magn. Reson. Imaging, 43: 149-158. doi: [10.1002/jmri.24975](https://doi.org/10.1002/jmri.24975) (PMID:26110513).

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i TCIA Citation

Clark K, Vendt B, Smith K, Freymann J, Kirby J, Koppel P, Moore S, Phillips S, Maffitt D, Pringle M, Tarbox L, Prior F. **The Cancer Imaging Archive (TCIA): Maintaining and Operating a Public Information Repository**, *Journal of Digital Imaging*, Volume 26, Number 6, December, 2013, pp 1045-1057. DOI: <https://doi.org/10.1007/s10278-013-9622-7>

Other Publications Using This Data

TCIA maintains a [list of publications](#) which leverage our data. If you have a publication you'd like to add, please [contact TCIA's Helpdesk](#).

1. Brunese, L., Mercaldo, F., Reginelli, A., & Santone, A. (2020). Formal methods for prostate cancer gleason score and treatment prediction using radiomic biomarkers. Magnetic resonance imaging, 66, 165-175. doi:<https://doi.org/10.1016/j.mri.2019.08.030>
2. Chatzoudis, P. (2018). MRI prostate cancer radiomics: Assessment of effectiveness and perspectives. (Master of Biomedical Engineering). Delft University of Technology, Delft, Netherlands. Retrieved from <http://resolver.tudelft.nl/uuid:b8459bdb-1761-4f17-8807-e3b1cf7da629>
3. Duran, A., Dussert, G., Rouviere, O., Jaouen, T., Jodoin, P. M., & Lartizien, C. (2022). ProstAttention-Net: A deep attention model for prostate cancer segmentation by aggressiveness in MRI scans. Medical image analysis, 77, 102347. doi:<https://doi.org/10.1016/j.media.2021.102347>

Versions

Version 2 (Current): Updated 2023/04/10

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Fused Rad-Path Matlab Files	Download	CC BY 3.0
Correspondence tables (XLSX)	Download	CC BY 3.0

Added a correspondence xlsx between MR and Pathology slides, imaging data are unchanged.

Version 1: Updated 2016/11/30

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Fused Rad-Path MATLAB Files	Download

