

# **Multimodality annotated HCC cases with and without advanced imaging segmentation (HCC-TACE-Seg)**

# Summary

## Redirection Notice

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Hepatocellular carcinoma (HCC) is the most common primary liver cancer with incidences doubled over the past two decades due to increasing risk factors. Despite surveillance, the majority of HCC cases are diagnosed at advanced stages that can be treated only using (Transarterial chemoembolization) TACE, or systemic therapy. TACE failure can occur to 60% of patients receiving the procedure, with subsequent financial and emotional burden. Radiomics have emerged as a new tool capable of predicting tumor response to TACE from pre-procedural CT study.

This retrospectively acquired data collection includes pre- and post-procedure CT imaging studies of 105 confirmed HCC patients who underwent TACE between 2002 and 2012 with an available treatment outcome, in the form of time-to-progression and overall survival. Baseline imaging includes multiphasic contrast-enhanced CT with no image artifacts (e. g. surgical clip) and was obtained 1-12 weeks (average 3 weeks) prior to the first TACE session. Semiautomatic segmentation of liver, tumor, and blood vessels created using [AMIRA](#) was manually clinically curated. These segmentations of each pre-procedural CT study were done for the purpose of algorithm training for prediction and automatic liver tumor segmentation, and are provided here (NIfTI converted to DICOM-SEG format).

## Acknowledgements

We would like to acknowledge the individuals and institutions that have provided data for this collection:

- The **University of Texas MD Anderson Cancer Center**, Departments of Imaging Physics, Body Imaging, Gastrointestinal Oncology, Epidemiology, and Interventional Radiology.
- Harmonization of the components of this dataset, including into standard DICOM representation, was supported in part by the NCI Imaging Data Commons consortium. NCI Imaging Data Commons consortium is supported by the contract number 19X037Q from Leidos Biomedical Research under Task Order HHSN26100071 from NCI.

## Data Access

### Data Access

Data Type	Download all or Query/Filter	License
Images and Segmentations (DICOM, 26.6 GB)	<a href="#">Download</a> <a href="#">Search</a> (Download requires the <a href="#">NBIA Data Retriever</a> )	CC BY 4.0
Clinical data with description (XLSX, 125 kB)	<a href="#">Download</a>	CC BY 4.0

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## Additional Resources for this Dataset

The following external resources have been made available by the data submitters. These are not hosted or supported by TCIA, but may be useful to researchers utilizing this collection.

- Source code is publicly available on Github at <https://github.com/fuentesdt/livermask>
- Multiple open-source software can be used to visualize the DICOM-Seg files; the authors of this Collection highly recommend using the latest stable version of 3D-Slicer for data visualization after installing the “quantitative reporting” extension. Step-by-step installation and guidance can be found in: <https://qiicr.gitbook.io/quantitative-reporting-guide/>. For the full list of the available software, please visit dcmqi documentation for instructions at: <https://dicom4qi.readthedocs.io/en/latest/results/seg/>

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

Image Statistics	
Modalities	CT, SEG
Number of Patients	105
Number of Studies	214
Number of Series	677
Number of Images	51,968
Images Size (GB)	26.6

These SEG were originally created as NIFTI format files ([Amira Software, ThermoFisher 2019](#)) , and converted to DICOM.

Github link for the NN code: <https://github.com/fuentesdt/livermask>

Note - the mask on Patient ID HCC\_001 (SEG file Series UID

1.2.276.0.7230010.3.1.3.8323329.719.1600928570.399942) has a slightly different dimension than the CT (Series UI 1.3.6.1.4.1.14519.5.2.1.1706.8374.302065206690360709343725942120) . This difference is far from the interesting features and the masks, so clinical interpretation should be unaffected by this discrepancy.

### Citations & Data Usage Policy

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### Data Citation

Moawad, A. W., Fuentes, D., Morshid, A., Khalaf, A. M., Elmohr, M. M., Abusaif, A., Hazle, J. D., Kaseb, A. O., Hassan, M., Mahvash, A., Szklaruk, J., Qayyom, A., & Elsayes, K. (2021). **Multimodality annotated HCC cases with and without advanced imaging segmentation** [Data set]. The Cancer Imaging Archive. <https://doi.org/10.7937/TCIA.5FNA-0924>

### Publication Citation

Morshid, A., Elsayes, K. M., Khalaf, A. M., Elmohr, M. M., Yu, J., Kaseb, A. O., Hassan, M., Mahvash, A., Wang, Z., Hazle, J. D., & Fuentes, D. (2019). **A Machine Learning Model to Predict Hepatocellular Carcinoma Response to Transcatheter Arterial Chemoembolization**. *Radiology: Artificial Intelligence*, 1 (5), e180021. <https://doi.org/10.1148/ryai.2019180021>

### 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. (2013). **The Cancer Imaging Archive (TCIA): Maintaining and Operating a Public Information Repository**. *Journal of Digital Imaging*, 26(6), 1045–1057. <https://doi.org/10.1007/s10278-013-9622-7>

## Other Publications Using This Data

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

1. Moawad, A. W., Morshid, A., Khalaf, A. M., Elmohr, M. M., Hazle, J. D., Fuentes, D., Badawy, M., Kaseb, A. O., Hassan, M., Mahvash, A., Szklaruk, J., Qayyum, A., Abusaif, A., Bennett, W. C., Nolan, T. S., Camp, B., & Elsayes, K. M. (2023). **Multimodality annotated hepatocellular carcinoma data set including pre- and post-TACE with imaging segmentation**. In *Scientific Data* (Vol. 10, Issue 1). <https://doi.org/10.1038/s41597-023-01928-3>

### Versions

#### Version 1 (Current): Updated 2022/08/17

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