

# Dicom Toolkit 0.4.1

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Dicom File I/O for GNU Octave.

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# 1 Installing and loading

The Dicom toolkit must be installed and then loaded to be used.

It can be installed in GNU Octave directly from octave-forge, or can be installed in an off-line mode via a downloaded tarball.

The toolkit has a dependency on the GDCM library (<https://http://gdcm.sourceforge.net/>), so it must be installed in order to successfully install the Dicom toolkit.

For fedora: `yum install gdcm-devel`

For ubuntu: `apt install libgdcm2-dev`

The toolkit must be then be loaded once per each GNU Octave session in order to use its functionality.

## 1.1 Online Direct install

With an internet connection available, the Dicom package can be installed from octave-forge using the following command within GNU Octave:

```
pkg install -forge dicom
```

The latest released version of the toolkit will be downloaded and installed.

## 1.2 Off-line install

With the Dicom toolkit package already downloaded, and in the current directory when running GNU Octave, the package can be installed using the following command within GNU Octave:

```
pkg install dicom-0.4.1.tar.gz
```

## 1.3 Loading

Regardless of the method of installing the Dicom toolkit, in order to use its functions, the toolkit must be loaded using the pkg load command:

```
pkg load dicom
```

The toolkit must be loaded on each GNU Octave session.

## 2 Basic Usage Overview

Dicom files consist of metadata and image data within a file. The Dicom toolkit provides functions to read and write dicom data.

```

%% read the meta information from a dicom file
> info = dicominfo ('test.dcm');
info =
    scalar structure containing the fields:
        Filename = a.dcm
        FileModDate = 04-Feb-2017 02:08:31
        FileMetaInformationVersion =
            0 1
        MediaStorageSOPClassUID = 1.2.840.10008.5.1.4.1.1.7
        MediaStorageSOPInstanceUID = 1.2.826.0.1.3680043.2.1143.4379544382488839209812957878553810312
        TransferSyntaxUID = 1.2.840.10008.1.2
        ImplementationClassUID = 1.2.826.0.1.3680043.2.1143.107.104.103.115.2.6.3
        ImplementationVersionName = GDCM 2.6.3
        SourceApplicationEntityTitle = GDCM
        ImageType = DERIVED \SECONDARY
        SOPClassUID = 1.2.840.10008.5.1.4.1.1.7
        SOPInstanceUID = 1.2.826.0.1.3680043.2.1143.4379544382488839209812957878553810312
        StudyDate = 20170203
        StudyTime = 210831.360586
        Modality = OT
        ConversionType = WSD
        NominalScannedPixelSpacing =
            1
            1
        StudyInstanceUID = 1.2.826.0.1.3680043.2.1143.1282184104726305239898701219563360204
        SeriesInstanceUID = 1.2.826.0.1.3680043.2.1143.938526508174485815508079931697619862
        SamplesPerPixel = 1
        PhotometricInterpretation = MONOCHROME1
        Rows = 10
        Columns = 5
        BitsAllocated = 8
        BitsStored = 8
        HighBit = 7
        PixelRepresentation = 0
        RescaleIntercept = 0
        RescaleSlope = 1
        RescaleType = US
        PixelData = not assigned

%% read the image data
> image = dicomread('test.dcm')
image = dicomread ('a.dcm')
image =
    0 0 0 0 0
    0 0 0 0 0
    0 0 0 0 0

```

```
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
```

Help for each function can be displayed by `help thefunctionname`  
ie:

```
help dicominfo
```

## 3 Function Reference

The functions currently available in the Dicom toolkit are described below;

### 3.1 Dicom Functions

#### 3.1.1 dicomanon

`dicomanon(file_in, file_out)` [Loadable Function]

`dicomanon(____, name, value)` [Loadable Function]

Anonymize a DICOM format file by removing or replacing specific fields.

*file\_in* is filename to read from.

*file\_out* is the filename to write to.

*name*, *value* optional name/value properties.

Known property names are:

`keep`        The value is a cell array of names to not remove during the anonymize procedure.

`update`      A structure of name/values to update rather than remove.

**See also:** `dicomread`, `dicomwrite`, `dicominfo`.

#### 3.1.2 dicomdict

`dictionary_name = dicomdict (get)` [Loadable Function]

`dicomdict (factory)` [Loadable Function]

`dicomdict (set, dictionary_name)` [Loadable Function]

Get or set the active dicom data dictionary.

The first usage returns the filename of the dictionary that is currently being used. Using `factory` resets the dictionary to the default. Using `set` allows setting the dictionary for future operations. In this case, the dictionary file *dictionary\_name* can be anywhere in the path.

**See also:** `dicomread`, `dicomwrite`.

#### 3.1.3 dicomdisp

`dicomdisp (filename)` [Loadable Function]

`dicomdisp (filename, [propertyname, propertyvalue ...])` [Loadable Function]

Read and display the metadata from a DICOM file.

*filename* - dicomfilename to display.

*propertyname*, *propertyvalue* - property pairs for options to the display function.

Currently the only known property is 'dictionary' to specify a non default dict to use.

**See also:** `dicomread`, `dicominfo`.

#### 3.1.4 dicominfo

`info = dicominfo (filename)` [Loadable Function]

`info = dicominfo (filename, dictionary, dictionary-name)` [Loadable Function]

`dicominfo (filename, options)` [Loadable Function]

`dicominfo filename` [Command]



**dicominfo** *filename options* [Command]

Get all data from a DICOM file, excluding any actual image. *info* is a nested struct containing the data.

If no return argument is given, then there will be output similar to a DICOM dump.

If the **dictionary** argument is used, the given *dictionary-name* is used for this operation, otherwise, the dictionary set by **dicomdict** is used.

*options*: **truncate**=*n* where *n* is the number of characters to limit the dump output display to *n* for each value.

**See also**: **dicomread**, **dicomdict**.

### 3.1.5 dicomlookup

*keyword* = **dicomlookup** (*group*, *element*) [Loadable Function]

[*group*, *element*] = **dicomlookup** (*keyword*) [Loadable Function]

Lookup an attribute in the DICOM data dictionary.

*keyword* = **dicomlookup** (*group*, *element*) will look in the current dicom dictionary for a specified *group* and *element* tag and returns string name of the attribute.

[*group*, *element*] = **dicomlookup** (*keyword*) will look in the current dicom dictionary for a specified *keyword* string and returns the *group* and *element* for keyword.

**See also**: **dicomdict**.

### 3.1.6 dicomread

*image* = **dicomread** (*filename*) [Loadable Function]

*image* = **dicomread** (*structure*) [Loadable Function]

Load the image from a DICOM file. *filename* is a string (giving the filename). *structure* is a structure with a field **Filename** (such as returned by **dicominfo**). *image* may be two or three dimensional, depending on the content of the file. An integer or float matrix will be returned, the number of bits will depend on the file.

**See also**: **dicominfo**.

### 3.1.7 dicomuid

*uuid* = **dicomuid** () [Loadable Function]

Generate a DICOM unique id .

*uuid* is a unique id string.

### 3.1.8 dicomwrite

**dicomwrite** (*im*, *filename*) [Loadable Function]

**dicomwrite** (*im*, *filename*, *info*) [Loadable Function]

Write a DICOM format file to *filename*.

*im* is image data or empty matrix, [], if only metadata save is required *filename* is filename to write dicom to. if [], then function runs in verbose trial mode. *info* struct, like that produced by **dicominfo**

**See also**: **dicomread**, **dicominfo**.

### 3.1.9 isdicom

**isdicom** (*filename*) [Loadable Function]

Return true if *filename* is a valid DICOM file.

**See also**: **dicomdict**, **dicominfo**, **dicomread**, **dicomwrite**.

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