User Manual for Reslice3Dto2D

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Introduction

The Reslice3Dto2D software is fully implemented in Python (version 3.8, Python Software Foundation, Beaverton, USA). The tool enables the user to reformat 3D DICOM data into 2D slices of reference 2D acquisitions.

Installation

Python is running on all common operating systems (Windows, Linux and macOS). The installation is described for Windows 10, adaptions might be necessary on other operating systems. During installation, an internet connection is necessary.

First of all, python needs to be installed in the version 3.8 or higher from https://www.python.org. Please ensure during installation to add Python to the system environment variable PATH. The tool is available from https://github.com/DSV-CUB/Reslice3Dto2D by clicking on Code → Download ZIP. After download, unpack the compressed data. In the unpacked directory a requirements.txt is available. The listed packages in that text file need to be installed. Start a command prompt by clicking on the start menu and search for command prompt. Write the command “cd <path to the directory where the requirements.txt is>” and run it with Enter. Now the command prompt is in that directory. Finally run the command “pip install -r requirements.txt”. After successful installation of the site-packages, the tool can be used by double clicking on RUN.sh or RUN_Windows.bat (Windows only).

Graphical User Interface

The Reslice3Dto2D tool consists of a single window graphical user interface (GUI) as shown in Figure 1. When starting the tool, the window automatically appears. The functionalities of the controls [1] to [13] are described in the following.

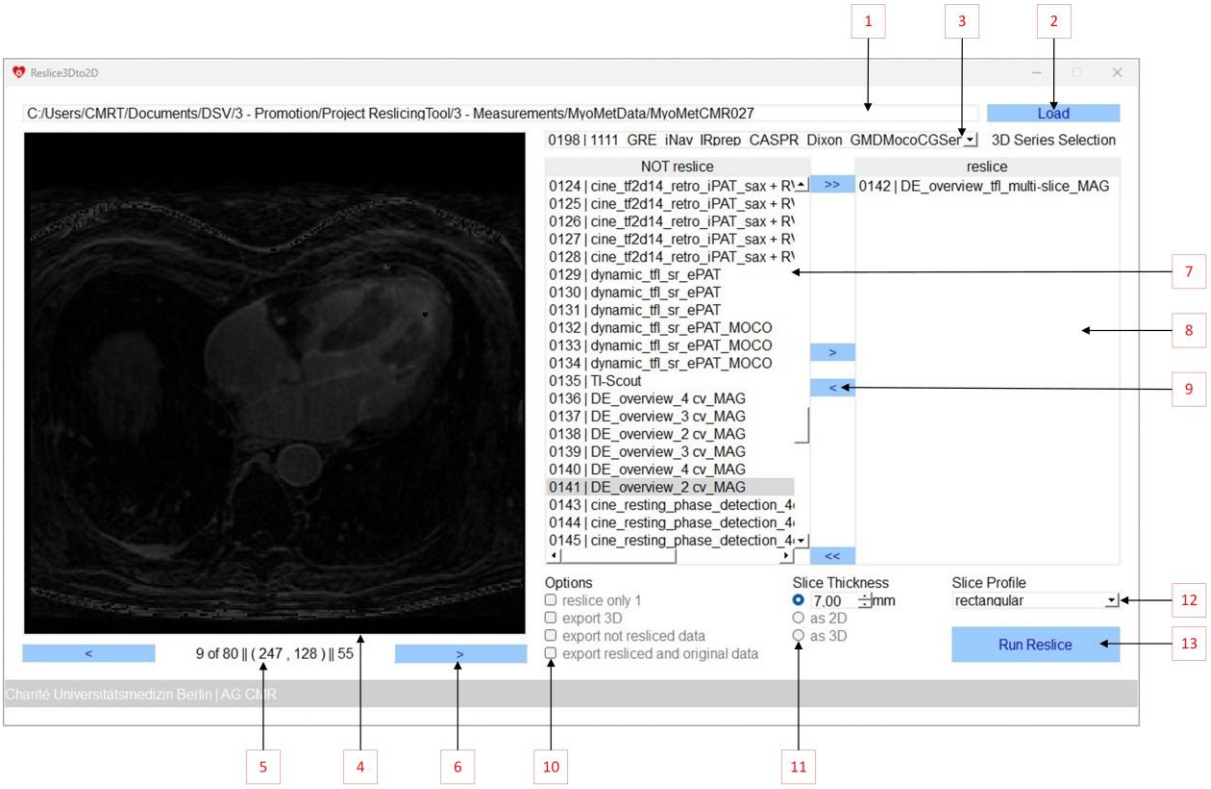

Figure 1: Graphical User Interface (GUI) of the Reslice3Dto2D tool

After starting the application, the click on [1] opens a dialog to choose a directory with data that should be imported. The chosen directory must contain only data from one examination. The load button [2] imports the DICOM data in the given directory from [1]. Depending on the amount of data within the examination, this step may take some time. During that time, the GUI freezes. The suffix of the data can be arbitrary as each file is checked for DICOM information. The dropdown menu [3] automatically shows the sequence number and name of the first occurring 3D sequence. The strict axial planes of the chosen 3D Dataset are shown in [4]. The information in [5] shows the number of planes within the 3D Dataset, the pixel location when hovering through the plane and its value. The buttons [6] below the image [4] allow to scroll through the planes. The list in [7] shows all sequences that are neither the chosen 3D dataset nor a dataset that should be used as a 2D reference slice. Therefore, the list in [8] is used to define all sequences that should be used as 2D reference plane for the

reslicing. Between the lists [7] and [8] can be toggled by selecting one or multiple sequences and using the buttons “>” and “<” [9]. The buttons “>>” and “<<” toggle all sequences in either direction.

For the export multiple options are available [10]: In the default case, only the novel resliced data is exported. If in the reslice list [8] CINE images are selected, multiple DICOM data at the same slice position but different phase is given. In order to obtain only one resliced plane instead of multiple replicas, the “reslice only 1” option is necessary. If the original 3D dataset should be exported in addition, the “export 3D” option is necessary. In order to have the non-resliced data from list [7] exported as well, the “export not resliced data” option needs to be checked whereas if both, the original data from the reslice list in [8] as well as the resliced data should be exported, the “export resliced and original data” option is necessary. Consequently, checking all options will export the complete dataset and the novel reformatted data at once.

The slice thickness option [11] defines the slice thickness of the resliced data. Either a fixed manual slice thickness is defined, the slice thickness of the individual reference slices in [8] should be used or the 3D resolution is used. Furthermore, the slice profile that represents the slice thickness [12] must be defined and captures one of the six options as shown in Figure 2. Finally, the reslice is performed by clicking on the run button [13].

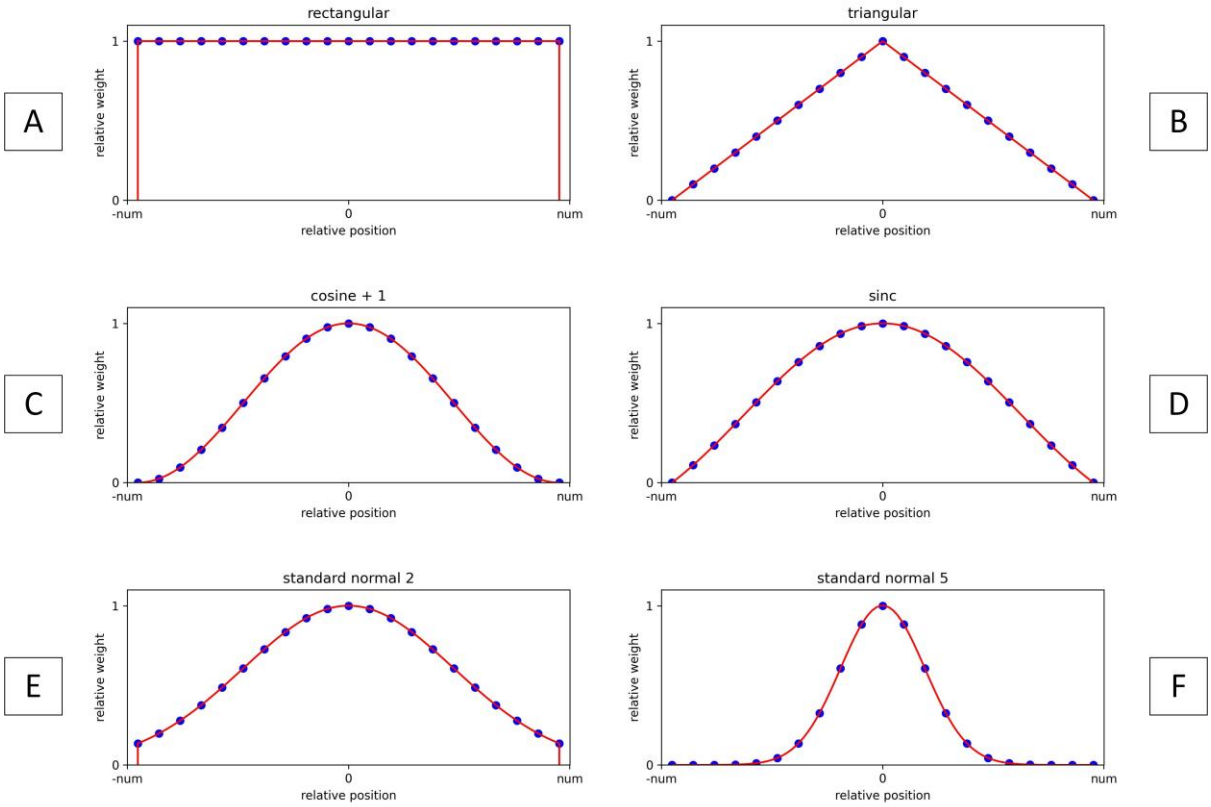

Figure 2: Slice Profiles in Reslice3Dto2D - [A] rectangluar, [B] triangular, [C] cosine +1, [D] sinc, [E] standard normal 2 and [F] standard normal 5

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