Ao's Notes on Medical Imaging Software

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Table 1: Revision History

Date	Author(s)	Change
Jan/30/2020	Ao Dong	Initial draft
Feb/02/2020	Ao Dong	Update
Feb/08/2020	Ao Dong	Changed table to a spreadsheet link

1 Software List

The link to the software list (Google Sheet): LINK
There are 50 packages in the list.

1.1 Sources

The above list is built based on 7 sources - 3 academical papers, 3 blog articles, and 1 online forum discussion. All of the sources are recorded on the second sheet in the list.

1.2 Orders

The software packages are put in the list roughly by the order of how many times they are mentioned in the above sources.

1.3 Selection

A few software packages mentioned in the sources are excluded, since they are in the following cases:

- Commercialized. Some software are not free any more. For example, PacsOne Premium, JVS-DiComPlus, RadiAnt, Synedra, TurtleSeg, AlgoM, Athena.

- No recent updates. A few software without recent release are excluded, such as PacsOne Basic (2005), K-PACS (developed for Windows XP or Windows VISTA), JVS-DiCom (2012), MITO-DICOM Viewer (2015), Aeskulap (2007), Fusionviewer (2008), Kradview (2013), Mayam (2013), Eviewbox (2015), EzDICOM (2013), Agnosco (2011), ONIS Free Version (2016 and not open-source), DICOMscope (2001).

1.4 Categories

The software packages are roughly divided into 3 major categories - Tool Kit, PACS, and Viewer.

- Tool Kits are usually used by developers to create new software, and there are only a few of them in the list.
- PACS stands for Picture Archiving and Communications System, which can be regarded as a type of server. There are also only several of them in the list, since most PACS solutions are commercial nowadays.
- Most software in the list are in the Viewer category, and many of these ones also provide other functions such as analysis, conversion, segmentation, etc.

2 Quality Measurements

2.1 Interoperability

There are not many measuring methods in papers, and most of them are very complicated.

- Can the workstation software (for visualization, analysis, etc.) connect with the PACS (server)?
- Does the software use output from or provide input to other software?
- Can the software work with customized plug-ins?

Measuring aspects from [Smith et al., 2018]:

- Does the software interoperate with external systems? (yes*, no)
- Is there a workflow that uses other softwares? (yes*, no)
- If there are external interactions, is the API clearly defined? (yes*, no, n/a)

2.2 Visibility/Transparency

- Does the software use any version and issue tracking system, such as Github, Gitlab for development?
- Does the software have documents recording the development process and status?
- Does the software have clear release log with essential information, such as release date, bug fixed and new features?

Measuring aspects from [Smith et al., 2018]:

- Is the development process defined? If yes, what process is used. (yes*, no, n/a)
- Ease of external examination relative to other products considered? (1 .. 10)

2.3 Productivity

Can be measured by the summation of all output (such as the number of lines of new code, the number of pages of new documents and the number of new test cases) produced per person-day.

However, it is hard for a third party to carry out the above method without knowing the exact number of developers or how much time they spent on the project.

2.4 Completeness

2.5 Consistency

References

W. Spencer Smith, Zheng Zeng, and Jacques Carette. Seismology software: State of the practice. *Journal of Seismology*, 22(3):755–788, May 2018.