Development of Computed Tomography Scanner Application: Prototype Model Approach

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Article Info

ABSTRACT

The development of software application for image reconstruction system is essential in the research study of computed tomography (CT). An experimental prototype was the research tool used in developing a series of useful prototype to evaluate the reconstruction methods. A CT scanner software prototype was created using the MATLAB image processing toolbox together with the Graphical User Interface (GUI) and Graphical User Interface Development Environment (GUIDE). The prototype model was selected to guide the development of the prototype application and mainly to provide a platform to update a system from the available knowledge. The prototype model was capable in creating a CT scanner synthetic datasets, display a sinogram image from the synthetic datasets, construct images using back projection technique and displaying cross-section images. Two types of images were acquired from this research, the first type was the unfiltered and blurred image and the second type was the filtered and clear image. This research also focused on two-dimensional parallel-beam and fan-beam geometry configuration; the principle of transforming fan-beam datasets into parallel-beam datasets was carried out using the classical rebinning concept

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1. INTRODUCTION

The prototyping model approach has much been practised in the development of computerized application systems such as for management information system and decision support system. This study implements a prototype model approach to develop an application for image reconstruction of computerized tomography (CT). The prototype model approach consists of four steps of interactive processes between system developers and users of the system [1]. Figure 1 depicts an illustration of the four-step interactive processes for the prototype model approach to which has been adapted in the development of a CT image reconstruction application. Initial versions of a prototype are basically defined and constructed by system developers and later used by consumers mainly to identify any flaws within the system. In the case that a problem is found during the system implementation process, system developers are required to take