

**EDITORS**

ERRY YULIAN TRIBLAS ADESTA

MOHAMMAD YEAKUB ALI

AKM NURUL AMIN

**DESIGN FOR MANUFACTURE**

Towards Improved Manufacturability



**IIUM Press**

# DESIGN FOR MANUFACTURE

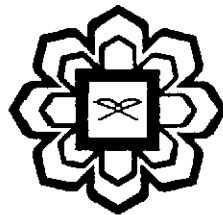
## Towards Improved Manufacturability

### EDITORS

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Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543  
EMAIL: iiumprinting@yahoo.com

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1 Faculty of Engineering – International Islamic University Malaysia  
2,3 School of Technology, Tunku Abdul Rahman College  
✉ : tasnim@iium.edu.my

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✉ : yusmawiza@iium.edu.my

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✉ : yusmawiza@iium.edu.my

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1, 2 Faculty of Engineering – International Islamic University Malaysia  
✉ : [belalghazal88@gmail.com](mailto:belalghazal88@gmail.com) ; ✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

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✉ : [tasnim@iium.edu.my](mailto:tasnim@iium.edu.my)

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Faculty of Engineering – International Islamic University Malaysia  
✉ : [tasnim@iium.edu.my](mailto:tasnim@iium.edu.my)

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MME Dept., Faculty of Engineering – International Islamic University Malaysia  
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✉ : [mohammad\\_iqbal@iium.edu.my](mailto:mohammad_iqbal@iium.edu.my)

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1, 2. Faculty of Engineering – International Islamic University Malaysia  
✉ : [mahmoodfattah@yahoo.com](mailto:mahmoodfattah@yahoo.com) / ✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

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1, 2, 3 Faculty of Engineering – International Islamic University Malaysia  
✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

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✉: mkonneh@iium.edu.my

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Faculty of Engineering - International Islamic University Malaysia  
✉: mkonneh@iium.edu.my

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Faculty of Engineering - International Islamic University Malaysia  
✉: mkonneh@iium.edu.my

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Abdus Sabur<sup>1</sup> and Mohammad Yeakub Ali  
Department of Manufacturing and Materials Engineering  
Faculty of Engineering, International Islamic University Malaysia  
✉: asbur72@yahoo.com

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Belal Ahmed Ghazal<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia  
✉: belalghazl88@gmail.com; ✉: eadesta@iium.edu.my

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Umer Mushtaq<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
<sup>1, 2</sup> Faculty of Engineering – International Islamic University Malaysia  
✉ : mirkaz9@hotmail.com ; mirkaz9@yahoo.com / ✉ : eadesta@iium.edu.my

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Mohamed Konneh<sup>1</sup>, and Muhammad Mukhtar  
Faculty of Engineering, International Islamic University Malaysia  
✉: [mkonneh@iium.edu.my](mailto:mkonneh@iium.edu.my)

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Mohamed Konneh<sup>1</sup>, and Abdul Halim  
Faculty of Engineering - International Islamic University Malaysia  
✉: [mkonneh@iium.edu.my](mailto:mkonneh@iium.edu.my)

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Abdus Sabur<sup>1</sup> and Mohammad Yeakub Ali  
Department of Manufacturing and Materials Engineering  
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✉ : [asbur72@yahoo.com](mailto:asbur72@yahoo.com)

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Mohammed Kaleemullah<sup>1</sup>, Erry Yulian Triblas Adesta<sup>1</sup>, Waleed F. Faris<sup>1</sup>  
<sup>1</sup> Faculty of Engineering, International Islamic University Malaysia  
[mkalim@gmail.com](mailto:mkalim@gmail.com), [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my), [waleed@iium.edu.my](mailto:waleed@iium.edu.my)

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Belal Ahmed Ghazal<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia  
✉: [belalghazl88@gmail.com](mailto:belalghazl88@gmail.com); ✉: [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

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Umer Mushtaq<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
<sup>1, 2</sup> Faculty of Engineering – International Islamic University Malaysia  
✉ : [mirkaz9@hotmail.com](mailto:mirkaz9@hotmail.com) ; [mirkaz9@yahoo.com](mailto:mirkaz9@yahoo.com) / ✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

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# A Surgical Training Model Manufacture Using Fused Deposition Modeling

Hasanudin Hafis Mohamad Ali, Md. Amir Hamzah Md. Shukri, WAY Yusoff  
Faculty of Engineering – International Islamic University Malaysia  
✉ : hasan.ma86@gmail.com; mdamirhamzah87@gmail.com

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## 1. Introduction

The use of technologies nowadays is more common in the medical area. The existence of rapid prototyping as technology originating from engineering is propitiating several progresses in medicine, mainly in the surgical planning. In this study we will present RP used as a tool to manufacture a biomedical solid model from a human skull for pre-surgical study procedures. It is meant that we are going to do three-dimensional reconstruction of a biomedical model from a two-dimensional image file obtained from CT scan. After finishing the reconstruction, Fused Deposition Modeling (FDM), one of the RP technologies is used to produce the solid model.

### 1.1 CT Images Conversion to 3D Models

The images is obtained from CT scan obey to the international standards from DICOM (Digital Imaging Communication in Medicine) pattern. Those are obtained from axial cuts of the study area and the equipment should be settled to the less possible thickness, as the lower this value is, the better will be the model quality [Foggiatto 2006].

### 1.2 Rapid Prototyping and Medical Application

RP is known as the automated manufacture of physical objects and it is an addictive constructive process, layer by layer that allow complex form objects direct production from three-dimensional data used to manufacture solid prototypes [Rocha & Alves 2000]. The geometries needed are obtained by using some CAD software or getting through the