



**IMPROVING THE ABILITY OF EXISTING MACHINE 3D  
FOR PRINTER METALLIC INFUSED FILAMENT  
THROUGH THE MODIFICATION OF PRINTING PARTS**

**A Final Project Report  
Submitted as one of the requirements to obtain  
Sarjana Teknik**

**By  
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**FACULTY OF ENGINEERING  
MECHANICAL ENGINEERING STUDY PROGRAM  
CIKARANG  
SEPTEMBER 2023**

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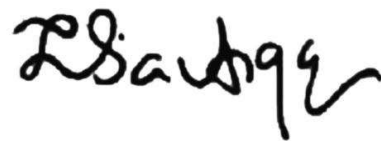
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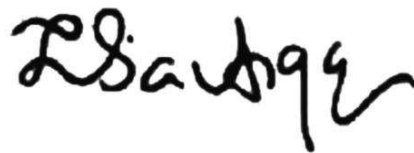
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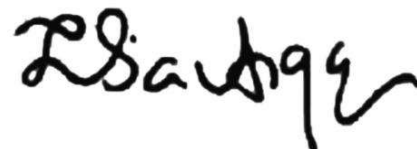
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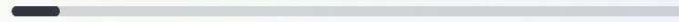
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<b>1</b>	Kumaresan Rajan, Mahendran Samykano, Kumaran Kadirgama, Wan Sharuzi Wan Harun, Md. Mustafizur Rahman. "Fused deposition modeling: process, materials, parameters, properties, and applications", The International Journal of Advanced Manufacturing Technology, 2022 Publication	<b>2</b> %
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## ABSTRACT

This project presents a comprehensive exploration of the advancement in metal additive manufacturing through the development of a 3D printer metal machine. The primary objectives of this endeavor are twofold: firstly, the creation of detailed 3D models, component by component, followed by assembly simulation using Solidworks; and secondly, the practical application of integrating metal filament extrusion into an existing 3D printer, specifically the Ender Pro model, with a meticulous analysis of temperature settings maintained within the range of 24-26 degrees Celsius. The first objective involves the meticulous design of intricate 3D models, deconstructed into individual parts, using advanced computer-aided design techniques. The assembly of these components is then simulated virtually using SolidWorks, a powerful software tool renowned for its accurate representation of mechanical systems. This simulation phase aims to assess the feasibility, functionality, and potential issues of the final assembly. The second objective is centered around the adaptation of the existing Ender Pro 3D printer for metal filament extrusion. The process involves rigorous analysis of temperature control mechanisms to ensure an optimal operational environment. By maintaining the ambient temperature between 24-26 degrees Celsius, the project aims to ascertain the effects of this controlled environment on the metal filament extrusion process. This analysis holds implications for improving print quality, minimizing defects, and advancing the overall capabilities of the metal 3D printing process. In conclusion, this project delves into the multifaceted realm of metal additive manufacturing, encompassing intricate 3D model design, assembly simulation, and practical application using an existing 3D printer. The integration of metal filament extrusion technology, coupled with precise temperature control, promises to unveil new dimensions in the field of metal 3D printing, potentially revolutionizing industries that rely on precision engineering and manufacturing.

**Keywords:** *3D Metal Printer, Metal PLA Filament, 3D Design SolidWorks, 3D Printer Metal Machine*

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