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

Cristovão Istinah Martins

003201700021

FACULTY OF ENGINEERING

MECHANICAL ENGINEERING STUDY PROGRAM

CIKARANG

SEPTEMBER 2023

PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **"Improving the Ability of Existing Machine 3d For Printer Metallic Infused Filament Through the Modification of Printing Parts"** That was submitted by Cristovao Istinah Martins majoring in Mechanical Engineering from the Engineering has been assessed and approved to have passed the Oral examination on 28th September, 2023.

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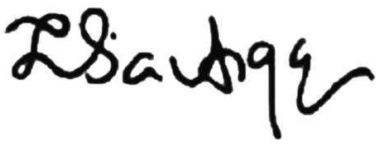

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Name : CRISTOVÃO ISTINAH MARTINS

Student ID number : 003201700021

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Faculty : Engineering

I hereby declare that my undergraduate thesis/final project/business plan, entitled **"Improving the Ability of Existing Machine 3d For Printer Metallic Infused Filament Through the Modification of Printing Parts"** is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism and will accept the sanctions against these acts in accordance with the rules and policies of President University.

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Cikarang, Indonesia, September 28th 2023

Cristovão Istinah Martins

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By

Cristovão Istinah Martins

003201700021

Approved by

Dr. Eng. Lydia Anggraini S. T., M. Eng

Final Project Supervisor and Head of Study
Program Mechanical Engineering

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As a student of the President University, I, the Undersigned:

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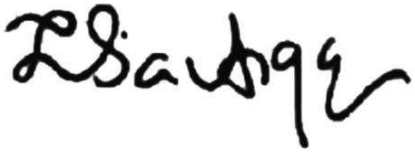

Dr. Eng. Lydia Anggraini S. T., M. Eng

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Cikarang, Indonesia September 28th 2023

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TURNITIN

Thesis Cristovao Istinah Martins (3D Printer Metal)

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	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	2%
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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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