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**Surat Tugas / Letter of Appointment**

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Nomor/  
Number ST/THS2/0225/AAO/II/2022 – DiPTanggal/  
Date 25 Februari 2022 / 25 February 2022

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**Penugasan Sebagai Pembimbing Utama/Pendamping Skripsi Mahasiswa S2 Semester Genap 2021/2022**  
**Appointment of Thesis Advisor/Co-Advisor for Master's Degree Student(s) in Even Semester 2021/2022**

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**Fakultas Teknik & Teknologi Informasi / Faculty of Engineering & Information Technology**Dekan Fakultas Teknik dan Teknologi Informasi, Universitas Swiss German/  
*The Dean of Engineering and Information Technology Faculty of Swiss German University,*Menimbang/*Considering:*

1. Perkuliahan S2 semester 2 yg telah berakhir/*The lectures for semester 2 have finished.*
2. Persyaratan untuk mencapai gelar pasca sarjana/*Requirements for Master's Degree graduation.*

Memperhatikan/*Referring to:* Hasil penunjukan Dekan Fakultas Teknik dan Teknologi Informasi/*The appointment by the Dean of Engineering and Information Technology Faculty.**Memutuskan/Has Reached the Decision:*

1. Dengan ini menugaskan kepada dosen yang tercantum pada lampiran, sebagai Pembimbing Utama/Pendamping skripsi program Strata Dua (S2) mahasiswa yang tercantum pada lampiran dengan masa penugasan 1 Maret 2022 sampai dengan 20 Juni 2022/*Herewith gives the task to the lecturers as listed on the attachment to become Thesis Advisor/Co-Advisor for the Masters student(s) listed on the attachment with period of task starting from 1 March 2022 until 20 June 2022.*
2. Dosen yang bersangkutan harus melaksanakan tugas dan tanggung jawab sebaik-baiknya, sesuai dengan petunjuk pembimbingan skripsi dari SGU/*The appointed lecturer shall accomplish the task in responsible ways in line with the thesis guidelines and other regulations given by SGU.*

Terima kasih atas perhatian dan kerjasama Saudara/*Thank you for your attention and cooperation.*

Dekan/Dean,

Dr. Maulahikmah Galinium, S.Kom, M.Sc.  
Dekan Fakultas Teknik dan Teknologi Informasi/  
*Dean of Engineering and Information Technology Faculty*Lampiran/*Attachment:*Daftar Nama Pembimbing Utama, Pendamping dan Mahasiswa pada Semester Genap 2021/2022  
*List of Thesis Advisor, Co-Advisor and Student in Even Semester 2021/2022.*

1. Lampiran 1/*Attachment 1:* Program Studi Magister Teknik Informatika/*Study Program of Master of Information Technology*
2. Lampiran 2/*Attachment 2:* Program Studi Magister Teknik Mesin/*Study Program of Master of Mechanical Engineering*

**Lampiran 2 Surat Keputusan: ST/THS2/0225/AAO/II/2022 – DiP**
*Attachment 2 to the Decree: ST/THS2/0225/AAO/II/2022 – DiP*

Daftar Nama Pembimbing Utama/Pendamping Skripsi Pada Program Magister,  
Program Studi Magister Teknik Mesin, Fakultas Teknik dan Teknologi Informasi, pada Semester Genap 2021/2022  
(Februari - Juni 2022)

*List of The Thesis Advisor/Co-Advisor Master's Degree Program,  
Study Program of Mechanical Engineering, Faculty of Engineering & Information Technology, in Even Semester  
2021/2022 (February – June 2022)*

**Daftar Pembimbing Utama/List of Advisor**

Nr.	Nama Pembimbing Utama/ <i>The Advisor's Name</i>	Status Dosen/ <i>Lecturer's Status</i>	Nama Mahasiswa/ <i>Student's Name</i>	NIM/ <i>Student's ID</i>	Judul Skripsi/ <i>Thesis Title</i>
1	Dena Hendriana, BSc., S.M., Sc.D.	Dosen Tetap/ Homebase Lecturer	Samuel Onasis Keliat	22152003	VACUUM DISTILLATION OIL PURIFICATION SYSTEM TO EXTENT LIFE TIME OF TURBINE LUBE OIL IN STEAM POWER GENERATION PLANTS
			Syaifuddin Zuhri	22152006	LAPPING MACHINE AUTOMOTION SYSTEM FOR OVERHOUL HYDRAULIC PUMP SMALL HYDRAULIC EXCAVATOR
			Yudhistira Nizar	22152008	AUTOMATIC WARNING SYSTEM FOR PREVENT COLLISIONS AND PROVIDE SAFE DISTANCE BETWEEN HEAVY DUTY-TRUCKS
2	Dr. Hanny J. Berchmans	Dosen Tetap/ Homebase Lecturer	Hafidz Akbar	22052011	WATER LEVEL CONTROL PID TUNING BY FUZZY-BASED METHOD FOR A BOILERSTEAM DRUM
3	Dr. Ir. Gembong Baskoro, M.Sc.	Dosen Tetap/ Homebase Lecturer	Rustanto	22152009	MTBF IMPROVEMENT SCANIA R580 BY USING FMEA ANALYSIS IN FULL MAINTENANCE CONTRACT PT SIS ADARO
			Firdaus Agung Syafutra	22152010	IMPACT OF CUSTOMER EXPERIENCE CHANGE MANAGEMENT WITH ADKAR MODELS TO IMPROVE PERFORMANCE MAINTENACE SCHEDULE AND EXECUTION AT CUSTOMER PT UNITED TRACTORS SITE JEMBAYAN - INDONESIA
4	Dr. Ir. Henry Nasution, M.T.	Dosen Tetap/ Homebase Lecturer	Hery Cahyadi	22152007	DROWSINESS DETECTION WITH COMPUTER VISION FOR HEAVY EQUIPMENT HAULER
			Himawan Kunto Dewoto Aji	22152004	DESIGN AND DEVELOP VEHICLE ANTI COLLISION SYSTEM
			Nelson Purba	22152002	APPLICATION OF COMPUTER VISION TO DETECT DEFECTS ON COPPER WIRE
5	Dr. Tanika D Sofianti S.T., M.T.	Dosen Tetap/ Homebase Lecturer	Anggi Febrianto	22152005	OPTIMIZING PARTS AVAILABILITY SCANIA PRODUCT THROUGH PREVENTIVE MAINTENANCE IN LEADING INDONESIAN HEAVY EQUIPMENT COMPANIES CASE SITE SUPPORT KUTAI BARAT
			William Septianugraha M	22152011	IMPROVING MAINTENANCE QUALITY ON HYDRAULIC SYSTEMS OF GD825A-2 TO REDUCE UNSCHEDULE BREAKDOWN IN INDONESIA HEAVY EQUIPMENT LEADING DISTRIBUTOR COMPANY

**Daftar Pembimbing Pendamping/List of Co-Advisor**

Nr.	Nama Pembimbing Pendamping/ <i>The Co-Advisor's Name</i>	Status Dosen/ <i>Lecturer's Status</i>	Nama Mahasiswa/ <i>Student's Name</i>	NIM/ <i>Student's ID</i>	Judul Skripsi/ <i>Thesis Title</i>
1	Dena Hendriana, BSc., S.M., Sc.D.	Dosen Tetap/ Homebase Lecturer	Himawan Kunto Dewoto Aji	22152004	DESIGN AND DEVELOP VEHICLE ANTI COLLISION SYSTEM
2	Dr. Aditya Tirta Pratama, S.Si, M.T.	Dosen Tetap/ Homebase Lecturer	Rustanto	22152009	MTBF IMPROVEMENT SCANIA R580 BY USING FMEA ANALYSIS IN FULL MAINTENANCE CONTRACT PT SIS ADARO
			Firdaus Agung Syafutra	22152010	IMPACT OF CUSTOMER EXPERIENCE CHANGE MANAGEMENT WITH ADKAR MODELS TO IMPROVE PERFORMANCE MAINTENACE SCHEDULE AND EXECUTION AT CUSTOMER PT UNITED TRACTORS SITE JEMBAYAN - INDONESIA
3	Dr. Eng. Cuk Supriadi Ali Nandar	Dosen Tidak Tetap/ Part Time Lecturer	Hery Cahyadi	22152007	DROWSINESS DETECTION WITH COMPUTER VISION FOR HEAVY EQUIPMENT HAULER

**Daftar Pembimbing Pendamping / List of Co-Advisor**

Nr.	Nama Pembimbing Pendamping / The Co-Advisor's Name	Status Dosen / Lecturer's Status	Nama Mahasiswa / Student's Name	NIM / Student's ID	Judul Skripsi / Thesis Title
4	Dr. Hanny J. Berchmans	Dosen Tetap / Homebase Lecturer	Samuel Onasis Keliat	22152003	VACUUM DISTILLATION OIL PURIFICATION SYSTEM TO EXTENT LIFE TIME OF TURBINE LUBE OIL IN STEAM POWER GENERATION PLANTS
			Yudhistira Nizar	22152008	AUTOMATIC WARNING SYSTEM FOR PREVENT COLLISIONS AND PROVIDE SAFE DISTANCE BETWEEN HEAVY DUTY-TRUCKS
5	Dr. Ir. Gembong Baskoro, M.Sc.	Dosen Tetap / Homebase Lecturer	Anggi Febrianto	22152005	OPTIMIZING PARTS AVAILABILITY SCANIA PRODUCT THROUGH PREVENTIVE MAINTENANCE IN LEADING INDONESIAN HEAVY EQUIPMENT COMPANIES CASE SITE SUPPORT KUTAI BARAT
			Willian Septianuggraha M	22152011	IMPROVING MAINTENANCE QUALITY ON HYDRAULIC SYSTEMS OF GD825A-2 TO REDUCE UNSCHEDULE BREAKDOWN IN INDONESIA HEAVY EQUIPMENT LEADING DISTRIBUTOR COMPANY
6	Dr. Ir. Henry Nasution, M.T.	Dosen Tetap / Homebase Lecturer	Syaifuddin Zuhri	22152006	LAPPING MACHINE AUTOMOTION SYSTEM FOR OVERHOUL HYDRAULIC PUMP SMALL HYDRAULIC EXCAVATOR
			Hafidz Akbar	22052011	WATER LEVEL CONTROL PID TUNING BY FUZZY-BASED METHOD FOR A BOILERSTEAM DRUM
7	Dr. Widi Setiawan	Dosen Tetap / Homebase Lecturer	Nelson Purba	22152002	APPLICATION OF COMPUTER VISION TO DETECT DEFECTS ON COPPER WIRE

Jumlah Pembimbing Utama Skripsi Studi Program Magister Teknik Mesin pada Semester Genap 2021/2022 adalah 5 orang  
*The Thesis Advisor of Study Program of Master of Mechanical Engineering Even Semester 2021/2022 in total are 5 persons*

Jumlah Pembimbing Pendamping Skripsi Studi Program Magister Teknik Mesin pada Semester Genap 2021/2022 adalah 7 orang  
*The Thesis Co-Advisor of Study Program of Master of Mechanical Engineering Even Semester 2021/2022 in total are 7 persons*

Dekan/Dean,


**Dr. Maulahikmah Galnium, S.Kom, M.Sc.**

Dekan Fakultas Teknik dan Teknologi Informasi /

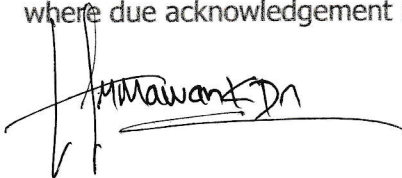
*Dean of Engineering and Information Technology Faculty*



## STATEMENT BY THE AUTHOR

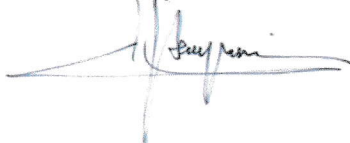
Name of Student : Himawan Kunto Dewoto Aji  
Student ID : 22152004  
Faculty : Engineering & Information Technology  
Study Program : Master of Mechanical Engineering – Mechatronics  
Date of Defense : 05 July 2022  
Thesis Title : Design and Develop Vehicle Anti-Collision Warning System

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



Himawan Kunto Dewoto Aji  
(Name of Student)

Approved by:  
Date: 18 July 2022



Dr. Ir. Henry Nasution, M.T.  
(Thesis Advisor)



Dena Herdiana, BSc., S.M., Sc.D.  
(Thesis Co-Advisor)

Acknowledged by:  
Date:



Dr. Maulahikmah Galinium, S.Kom, M.Sc.  
(Dean of Faculty of Engineering & Information Technology)

**DESIGN AND DEVELOP VEHICLE ANTI-COLLISION WARNING SYSTEM**

By

Himawan Kunto D.A.  
22152004

MASTER'S DEGREE  
in

MECHANICAL ENGINEERING – MECHATRONIC  
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY



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June 2022

**ABSTRACT**

## DESIGN AND DEVELOP VEHICLE ANTI COLLISION WARNING SYSTEM

By

Himawan Kunto D.A.  
Dr. Henry Nasution, Advisor  
Dena Hendriana, BSc., S.M., Sc.D., Co-Advisor

## SWISS GERMAN UNIVERSITY

The automobile industry grows exponentially due to the vehicle demand but in another side the road accident is still quite high and most of the accident due to vehicle are collide head-to-head or rear-end crush. Many technologies already exist in the area of vehicle anti-collision still and also many researches are going in the vehicular anti-collision field. The proposed system is consisted of two independent warning modules namely laser range finder and ultrasonic. This module is fixed in all vehicles to reduce the vehicle collision. When the object is detected a few meters, Arduino activate the electrical driver to trigger actuator namely buzzer and lamp to working follow the setup programing.

*Keywords: Vehicle anti-collision, Collision Warning System, Laser Range Finder Sensor, Ultrasonic Sensor.*

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## **DEDICATION**

I dedicate this works for my beloved country: Indonesia



## ACKNOWLEDGEMENTS

In this opportunity, the researcher would like to express great gratitude to:

1. Mr. Dr. Henry Nasution and Mr. Dena Hendriana, B.Sc., S.M., Sc.D, as advisor and Co-Advisor who has provided support, both time, energy and thoughts during the mentoring period.
2. All teaching staff of the Swiss German University master of mechatronic program for all the knowledge, direction, assistance and guidance during the 2021-2022 lecture period. Do not forget all the staff of the Secretariat of the Postgraduate Program in Administrative Sciences, University of Indonesia for their help and cooperation so far.
3. Parents and the whole extended family for their support, attention and prayers during the researcher's lectures and thesis writing.
4. Friends in the Master of Mechanical Engineering program at Swiss German University.

In preparing this thesis, the researcher has limitations, so this thesis is open to receiving suggestions and input. In addition, the researcher apologizes if the researcher has made mistakes, whether intentional or not, during the preparation period. Finally, I hope this thesis will be useful for all of us.

Jakarta, June 2022

Himawan Kunto Dewoto Aji

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