CRIM
Centre for Research and Innovation Management
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

EKSPLORASI

EXPLORATION

THE HEART OF MICROWAVE ANTENNA MEASUREMENT

Anechoic Chamber

EKSPLORASI

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Universiti berperanan sebagai penyumbang utama penyelidikan saintifik dalam menerajui sesuatu bidang ilmu serta menghasilkan ciptaan dan inovasi. UTeM sebagai sebuah universiti teknikal meletakkan sasaran strategik bagi membantu serta berkerjasama dalam menyelesaikan masalah industri dan komuniti. Justeru, ekosistem penyelidikan dan inovasi yang dinamik sangat penting bagi menyediakan persekitaran yang kondusif dalam menjayakan kelestarian dan kecemerlangan penyelidikan.

Di dalam Ekosistem Penyelidikan dan Inovasi (P&I), UTeM mensasarkan projek-projek penyelidikan berimpak bersama industri, komuniti dan agensi, disamping memberikan komitmen dalam menyokong hala tuju pembangunan peringkat negeri, kebangsaan serta global seperti yang digariskan di dalam Sustainable Development Goal (SDG), 10-10 Malaysin Science, Technology, Innovation and Economic Framework (MySTIE) dan Melaka Green City Action Plan (GCAP).

Selain itu, rangka-kerja P&I perlu melibatkan semua pihak berkepentingan di UTeM. Ini bagi membantu aktiviti-aktiviti penyelidikan yang dijalankan oleh staf akademik yang berada di fakulti, pusat kecemerlangan dan kumpulan penyelidikan dengan

lebih berkesan dan seterusnya memperkukuhkan bidang nic UTeM iaitu Advanced Manufacturing and Computing Technology. Semua ini terangkum didalam Polisi Penyelidikan UTeM 2021.

Justeru, ekosistem penyelidikan dan inovasi yang dinamik sangat penting bagi menyediakan persekitaran yang kondisif dalam menjayakan kelestarian dan kecemerlangan penyelidikan.

Pusat Pengurusan Penyelidikan dan Inovasi (CRIM) melalui sokongan pengurusan tertinggi universiti mengambil pendekatan inklusif dalam meneruskan agenda kecemerlangan P&I. Ini termasuklah menawarkan pelbagai geran penyelidikan yang bukan sahaja kepada Pensyarah, tetapi juga kepada Guru Bahasa, Jurutera Pengajar dan Pentadbir selaras dengan slogan 'Penyelidikan Untuk Semua'. Melalui kesempatan ini kami ingin berkongsi edisi Jan-Jun 2022 majalah digital "Explorasi" - bagi meneruskan inisiatif dalam merakamkan penghargaan kepada penyelidik UTeM dengan memaparkan pencapaian serta perkongsian hasil penyelidikan yang berimpak.

Selamat Hari Raya Aidilfitri, Maaf Zahir & Batin !!!

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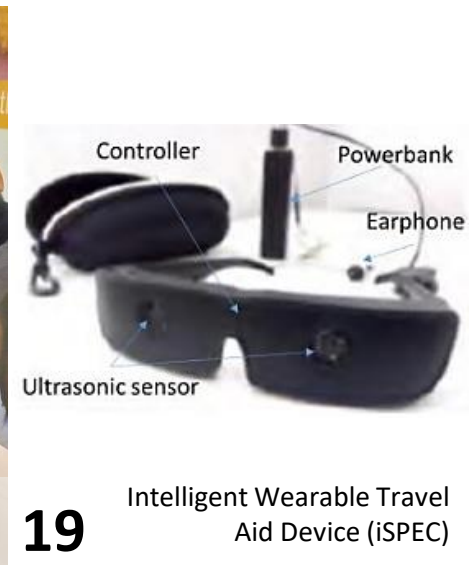**18**

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Anechoic Chamber: The Heart of Microwave Antenna Measurement

Prof. Madya Dr. Imran bin Mohd Ibrahim, FKEKK

Anechoic Chamber with microwave absorber.

An anechoic chamber uses metal walls to shield our equipment from extraneous radio signals. To minimize the unwanted reflections, unique RF absorbing materials are used to cover the interior walls of the chamber. The shielding test environment from outside interference and minimal wave reflection off the walls simulates being inside an infinitely large room and enables accurate, repeatable measurements.

The inside surfaces of anechoic chambers are often covered with foam pyramids loaded with conductive carbon. The tapered structure of the pyramid transitions the radio waves from the air to the lossy carbon employed in the pyramids with minimal wave reflection. The RF absorbers should absorb all of the incident electromagnetic energy and convert it to heat. UTeM's researcher has conducted research on Indigenous Microwave Absorber development.

The tapered structure of the pyramid transitions the radio waves from the air to the lossy carbon employed in the pyramids with minimal wave reflection.

This facility has contributed significantly to the research and development of the Faculty of Electronics and Computer Engineering under the Microwave Research Group. Many PhD and postgraduate students have utilised this Chamber for the research topic. This Chamber has also been used by researchers from other institutions in Malaysia and Indonesia.

Scopus database recorded 1378 citations counted from this laboratory activity with 106 international collaborations. This laboratory also attracted major RF and microwave industries such as Keysight Technologies, Man and Tel Co Ltd, South Korea, U-Mobile Malaysia, and many more. This facility also becoming an educational showcase for the primary and secondary schools in Malaysia.

This Anechoic Chamber has cost half a million and almost 1 million including antenna measurement system. With this kind of facility, UTeM is ready to become a national reference in RF and Microwave Measurement.

UTeM configuration utilising IMAD prototype.

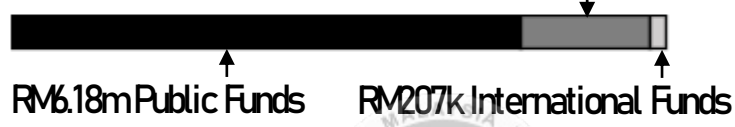# Summary: <u>RDCI</u> <u>Achievements</u> 2021 ★★★★

All data is based on internal audit of the Malaysia Research Assessment (MyRA) 2021

Research Grant

RM7.95m Research Funds

RM1.56m Private/Industrial Funds

RM6.18m Public Funds   RM207k International Funds

319 Principle Investigators

125 University | 156 National | 23 Industry | 15 International

Postgraduates
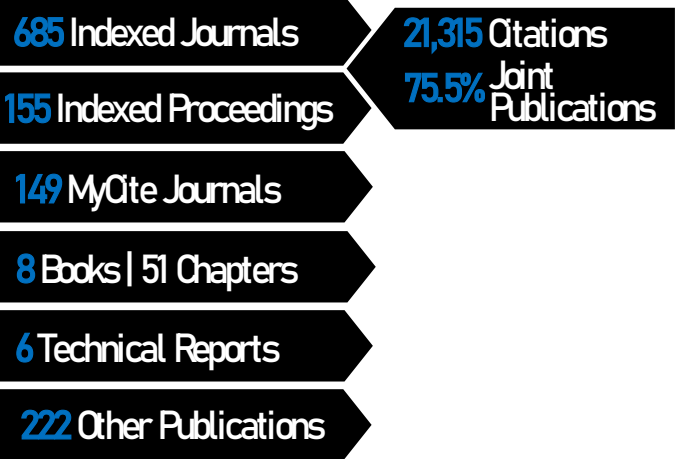
64 PhDs
72 Masters

2.01 ratio of PG enrolled to active researchers

Publication

685 Indexed Journals   **21,315** Citations
155 Indexed Proceedings   **75.5%** Joint Publications
149 MyCite Journals
8 Books | 51 Chapters
6 Technical Reports
222 Other Publications

Awards / Recognitions for Research Excellence

1 International | **2** National

Knowledge Transfer Program

98 New projects

69 Communities receiving/ benefiting from projects

Patents

6 Granted
5 Filed

Others IPRs

71

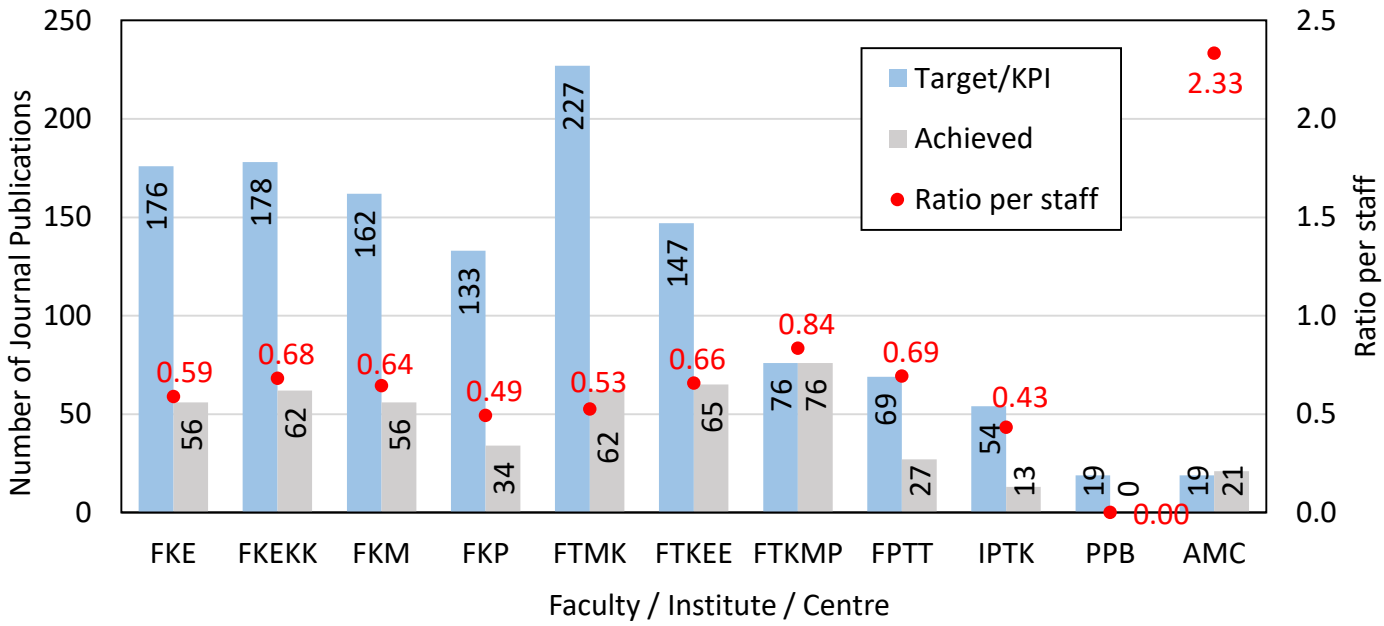## Exhibition Awards

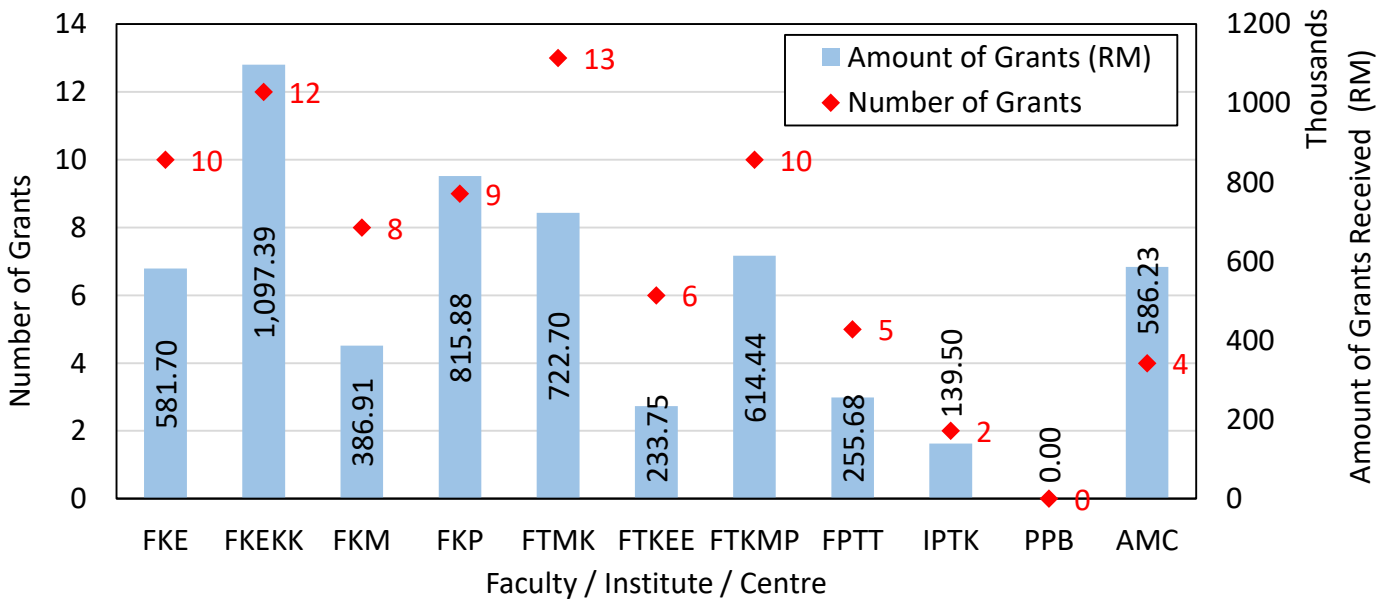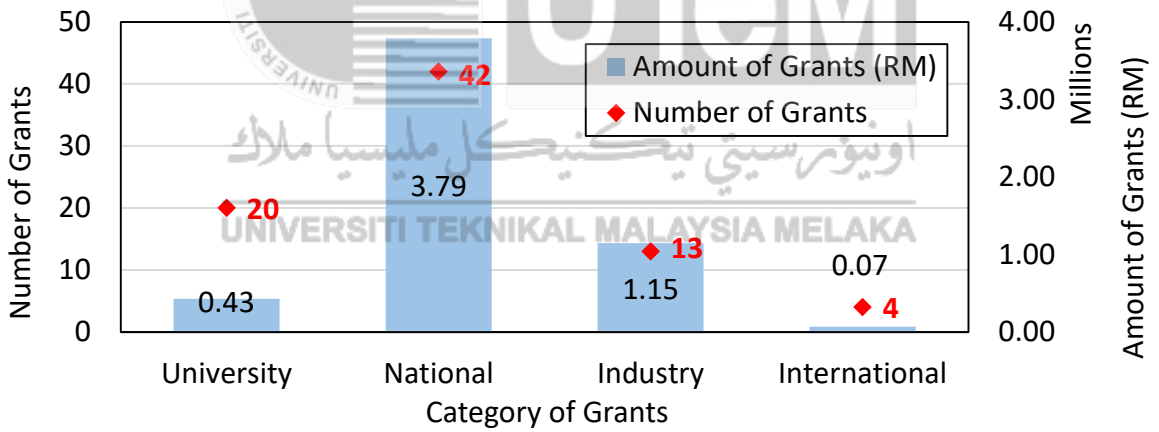**4** Special Awards
18 Gold Medals

Collaboration Agreement

28 International MoA/MoU
42 National MoA

Indexed Journal Publications 2021 as Corresponding/Main Author

Number and Amount of Research Grants Received 2021

PENARAFAN BINTANG MyRA KUMPULAN PENYELIDIKAN (RG) TAHUN 2021

5 BINTANG : 4 RG
4 BINTANG : 17 RG
3 BINTANG : 9 RG

ENERGY & AUTOMOTIVE

ELECTRICAL ENERGY CONVERSION & HUMAN ASSISTIVE MACHINES

SMART SYSTEM & INNOVATIVE DESIGN

TECHNOPRENEURSHIP DEVELOPMENT

ADVANCED COMPUTING TECHNOLOGY (ACT)

WIRELESS COMMUNICATION SYSTEM DESIGN, NANO COMPUTING & INFORMATION ENGINEERING

Tahniah Penyelidik

Penyelidik UTeM yang telah mencapai H-index (Scopus) ≥ 15.

CONGRATULATION SCHOLAR!
TOP H-INDEX IN SCOPUS

PROFESOR DR. MOHD KHANAPI BIN ABD GHANI, FTMK
H-INDEX = 21

PROFESOR MADYA IR. TS. DR. ABDUL RAHIM BIN ABDULLAH, FKE
H-INDEX = 20

PROFESOR IR. DR. KENNETH A/L SUNDARAJ, FKEKK
H-INDEX = 19

DR. MUHAMMAD IMRAN QURESHI, FPTT
H-INDEX = 19

PROFESOR IR. DR. MOHD ASYADI 'AZAM BIN MOHD ABID, FKP
H-INDEX = 18

ISKANDAR BIN WAINI, FTKMP
H-INDEX = 18

IR. DR. ANAS BIN ABDUL LATIFF, FKEKK
H-INDEX = 18

PROFESOR DR. ZAHRILADHA BIN ZAKARIA, FKEKK
H-INDEX = 17

PPROFESOR MADYA IR. DR. GAN CHIN KIM, FKE
H-INDEX = 17

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PEJABAT TNCPI — UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UTeM — UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Tahniah Penyelidik

Penyelidik UTeM yang telah mencapai H-index (Scopus) ≥ 15.

Tahniah Penyelidik

Penyelidik UTeM yang telah menerbitkan artikal di jurnal berindek WoS-SCIE/SSCI Q1 & Q2.

Tahniah Penyelidik

Penyelidik UTeM yang telah menerbitkan artikal di jurnal berindek WoS-SCIE/SSCI Q1 & Q2.

Tahniah Penyelidik

Penyelidik UTeM yang telah menerbitkan artikal di jurnal berindek WoS-SCIE/SSCI Q1 & Q2.

Anugerah Top Research Scientists Malaysia (TRSM) bagi Tahun 2021

Prof. Dr. Zahriladha bin Zakaria telah menerima anugerah *Top Research Scientists Malaysia* (TRSM) bagi tahun 2021. Seramai 22 pemenang telah diumumkan oleh Akademik Sains Malaysia bagi tahun berkenaan.

Anugerah Lantikan Sebagai Fellow of The Academy of Sciences Malaysia Pada Tahun 2021

Prof. Datuk Wira Raha binti Abdul Rahim FASc, mantan Naib Canselor UTeM telah menerima anugerah lantikan sebagai Fellow of The Academy of Sciences Malaysia pada tahun 2021 bagi disiplin Biological, Agricultural and Environmental Science. Individu yang dilantik sebagai fellow ini merupakan dikalangan saintis, jurutera dan teknologis yang terkemuka dan dikenali di Malaysia.

Development of a Semi-Automatic Cone Laying and Picking Machine for Maintenance and Emergency Use

Prof. Madya Ir. Ts. Dr. Mohd Azli bin Salim, AMC

Penyelidikan berteraskan "Demand-Driven" bersama pihak industri merupakan aspirasi bagi sesebuah universiti untuk melangkah ke alam perkongsian pintar antara universiti-industri. Prof. Madya Ir. Ts. Dr. Mohd Azli bin Salim bekerjasama dengan sebuah syarikat gergasi konsesi lebuhraya di Malaysia, iaitu PLUS Malaysia Berhad (PMB). Menerusi kerjasama ini, penyelidikan bersama bertajuk "Development Of A Semi-Automatic Cone Laying And Picking Machine For Maintenance And Emergency Use" menerusi "Letter of Acceptance and Confirmation Fees (LOAC)" berjumlah RM 350,002.92 telah dijalankan. Ini merupakan projek padanan MTUN. Menerusi penyelidikan ini, sebanyak 6 penerbitan berindeks WoS dan SCOPUS telah berjaya diterbitkan serta 6 harta intelek telah didaftarkan. Selain itu, Syarikat spin-off pertama UTeM yang di beri nama Intelligent Engineering Technology Services Sdn. Bhd. telah ditubuhkan pada awal tahun 2021.

Real-Time Flash Flood Warning System Using Electromagnetic Sensor

Prof. Madya Dr. Mohd Riduan bin Ahmad, FKEKK

Projek penyelidikan yang bertajuk 'Real-Time Flash Flood Warning System Using Electromagnetic Sensor' ini bermula pada tanggal 1 Disember 2018 dan telah mengambil masa selama 36 bulan untuk diselesaikan dengan jayanya. Projek ini telah dijalankan dengan kerjasama daripada Universitas Sriwijaya (UNSRI) di Palembang Indonesia. Projek penyelidikan ini mampu mengesan banjir kilat dengan lebih awal dan tepat berdasarkan masa sebenar sebagai amaran sebelum berlakunya banjir. Data-data dikumpul dengan menggunakan alat pengesan elektromagnet (EMS) dan radar cuaca bagi membuat ramalan tersebut.

Assistive Travel Aid Technology for Blind Person

Ir. Dr. Anuar bin Mohamed Kassim, FKE

The World Health Organization (WHO) has released statistics on People with Disabilities(PWDs) globally estimated as more than 15% of the world's population. From these statistics, the Visually Impaired Persons (VIPs) are 285.4 million people, whereas China and India got the highest population of VIPs. Actually, everyone can be blind at any time. Sometimes started from baby, glaucoma, cataract, and unexpected accident. Imagine, what happens if it suddenly happened to us. It is very hard to accept and adapt to the new world. Conventionally, most VIPs are using a white cane for travelling. However, the white cane has a limited access range because the white cane can only detect the obstacle below the abdomen level.

From the survey, 300 VIP experts in using white canes have experience collisions with a head-level obstacle. 39% of respondents experienced head-level accidents once a year.

For VIPs, there are two areas that need to be protected. Therefore, if there is an obstacle at the head level, they can have a collision. These obstacles such as open windows, signboard, back stair, rear trucks and etc. It's very important to have protection for the head level. From the survey, 300 VIPs expert in using white cane have experience collision with a head-level obstacle. 39% of respondents experienced head-level accidents once a year.
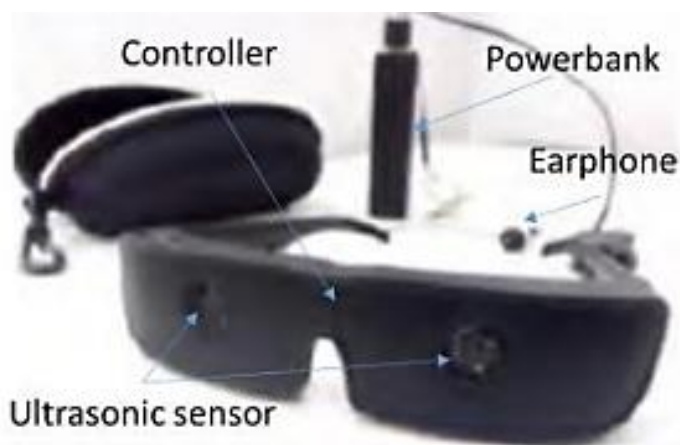
Intelligent Wearable Travel Aid Device (iSPEC)

Therefore, to overcome such problem, a new intelligent travel aid device has been developed after conducting some surveys, prototyping, and development. Our designed and developed prototype imitates the spectacle used by the VIPs which is called i-SPEC, the future of vision. i-SPEC stands for "intelligent spectacle" that filled with smart sensors to detect front, top, left, and right by applying the non-contact approach. The rechargeable battery also can be easily rechargeable by USB docking. The battery capacity can be signified when the user switches ON the device.

This product can be used for various types of VIPs. Each category has different warning types such as light for partially blind, audio, and vibration through bone conduction speaker, for a fully blind and deaf-blind person. By using a bone conduction speaker, user also can hear the environment surround while hearing the alert.

For technology readiness level, the i-SPEC currently where the integrated pilot system is demonstrated. To market i-SPEC, there are two marketing strategies by direct selling for the affordable VIPs through online such as Shoppe, Lazada, Amazon, eBay, Alibaba and etc. beside the pharmacy such as Watson, Guardian, Cosway and etc. Besides, the indirect strategies for the non-affordable VIPs such as government initiatives, corporate social responsibilities (CSR), and non-profit government organizations (NGO). Finally, the i-SPEC is truly believed that can improve the mobility of the VIPs and increase the quality of their life.
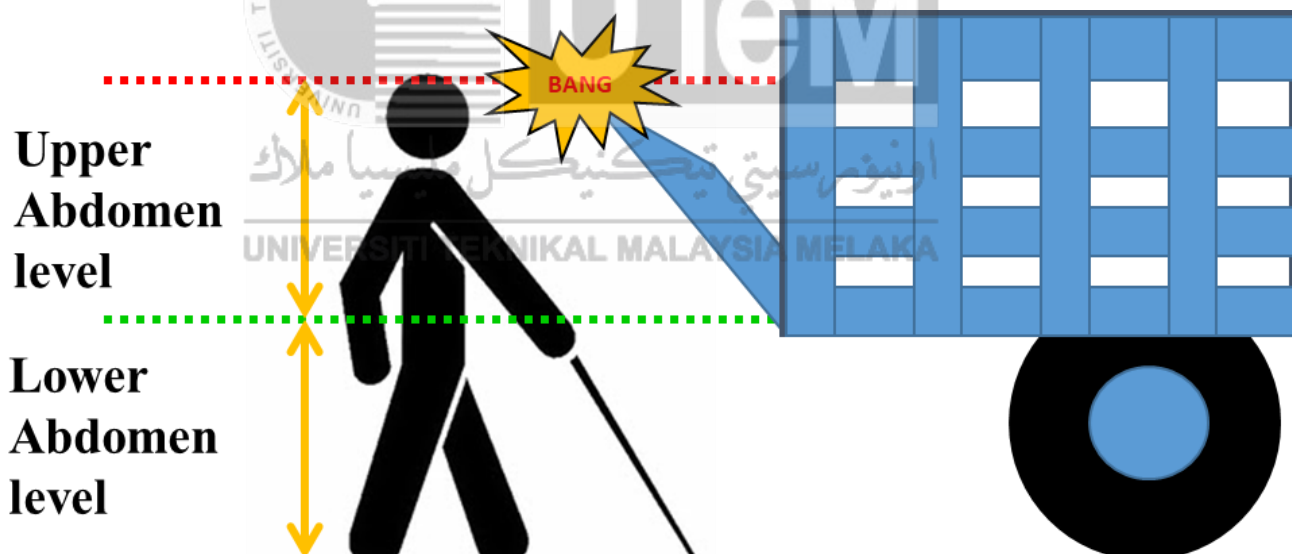
Previously, i-SPEC has been sponsored by Standard Chartered under the CSR program to deliver to the VIPs. The i-SPEC has patent file with no. PI2012003042, Copyright for the algorithm and the developed circuit layout and industrial design filed no. 13016000101. Some publications in the journals and conferences also has been conducted such as in Journal of Advanced Mechanical Design, Systems, and Manufacturing (JAMD SM), Vol. 10, No. 7, p. JAMDSM0094, 2016. This product also received some awards from Institute of Electrical Engineer Japan(IEEJ) and recent awards are from Takeda Foundation, Japan for Young Entrepreneur Award along with Asia Pacific ICT Award(APICTA) and Start-up Business Plan Challenges by MDEC and recently from Special Foreign Award by International Federation of Inventors' Association (IFIA) and Gold Award in MTE2022.

Touchless COVID-19 Medical Trolley

Ts. Dr. Norhashimah binti Mohd Saad, FTKEE

A touchless robotic trolley has been developed to help eliminate physical contact and reduce the risk of infection among medical staff and frontliners treating COVID-19 patients. TroVid 2.0 comprises an automatic video guidance, a smartphone touch screen controller, a wireless remote controller, a human follower, an obstacle avoiding detection system, and an integrated power supply. The wireless remote drives the trolley to move forward and backward. An IP camera is attached to the trolley to provide visual guidance controlled using smartphone.

TroVid 2.0 comprises an automatic video guidance, a smartphone touch screen controller, a wireless remote controller, a human follower, an obstacle avoiding detection system, and an integrated power supply.

The trolley uses ultrasonic sensors for human follower and obstacle detection. The movement of TroVid 2.0 can be controlled in three methods. The first method is to control the trolley by using wireless remote-control switch. The trolley is also equipped with IP camera as the second method to control the trolley. This IP camera has built-in Wi-Fi to provide video guidance for navigating the trolley. The trolley is controlled via a smartphone through an application called V380 in forward, backward, left and right directions. The third method is human follower using ultrasonic sensors. This method is the simplest and easiest way to make a trolley move in any directions.

Trolley

IP Camera

Ultrasonic Sensor

Power Window

Smartphone

Switch

Electronics circuit
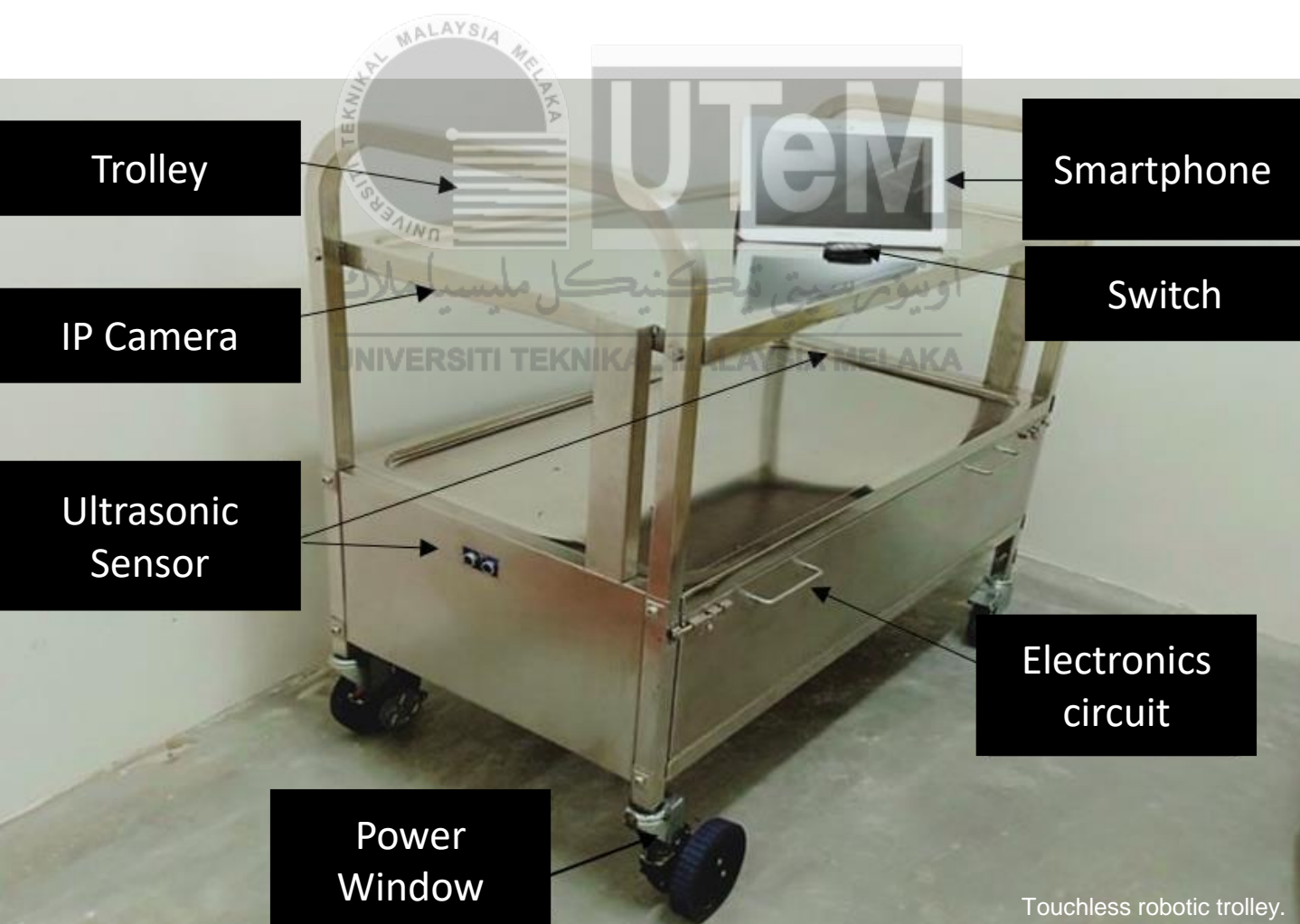
Touchless robotic trolley.

IoT Smart Traffic Camera Sensing Empowering City Manager to Better Manage The City

Prof. Madya. Dr. Lim Kim Chuan, FKEKK

The manager of the city always suffer with the lack of man-power in properly managing the traffic junction signal timing. Existing loop detection system senses the present of vehicle on top of the loop and passed this information to the traffic signal controller to decide how many second of green time is needed to clear all the vehicles waiting at the intersection.

Competing & Technologies

	Loop detector (out)	Lane loop detector (in & out)	Smart camera: 50 meters sensing	Radar: 300 meters lane sensing

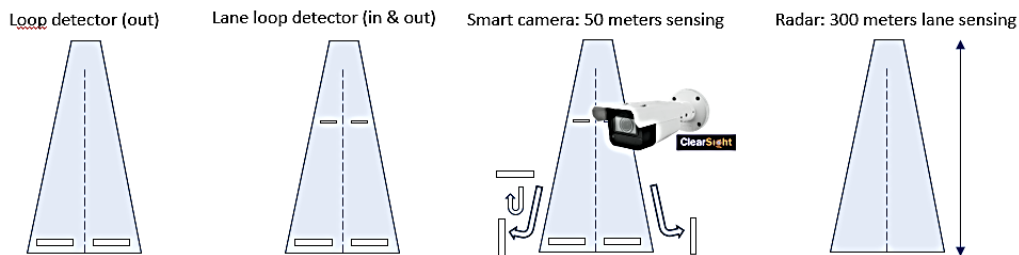|	Loop detector (present)	Lane loop detector	Smart camera	Radar + Camera
Costing	$	$$	$$ + 4G Sim + Cloud	$$$$$$$$$$$$$$$++
Counting	✓	✓	✓	✓
Degree of Saturation (how good green time is utilized)	✓	✓	✓	✓
Traffic engineering data collection (vehicle classification, lane occupancy, waiting time, residual for auto detection of green time under provided)		✓	✓	✓
Left, Right U-Turn, Driver Origin & Destination			✓	✓
In lane driving behaviour			✓	✓
Illegal maneuver and enforcement			✓	✓
License plate journey time			✓	✓
Sensing range	Present sensing	Lane	Field of view camera (50m)	Very long range (300m)

The team believes IoT smart traffic camera sensing with automated traffic signal management solution will be able to provide extra hands to the city manager to better manage the city and seamlessly resolve the traffic signal timing issue.

Traffic signal engineer has no choice to rely on the present sensor for traffic sensing as it can work in all weather condition with affordable maintenance cost. However, the nature of vehicle presenting sensing has no where to know how many vehicle remain to be cleared during the rush hour and will only gain attention when raised out by the citizen in the city. The city manager definitely would like to immediately dispatch the traffic signal engineering team the next day to resolve the issue but always against the will as time always needed to carry out the study.

Making use of the well-established artificial intelligence at the edge traffic camera analytics, researcher in UTeM together with local traffic light manufacturer LED Vision Sdn. Bhd. has jointly developed the smart traffic camera which could immediately reports vehicle remained waiting at the intersection the moment green light terminated.

The team believe IoT smart traffic camera sensing with automated traffic signal management solution will be able to provides extra hands to the city manager to better manage the city and seamlessly resolve the traffic signal timing issue.
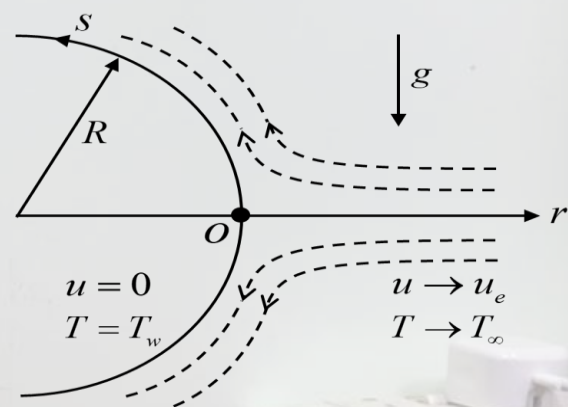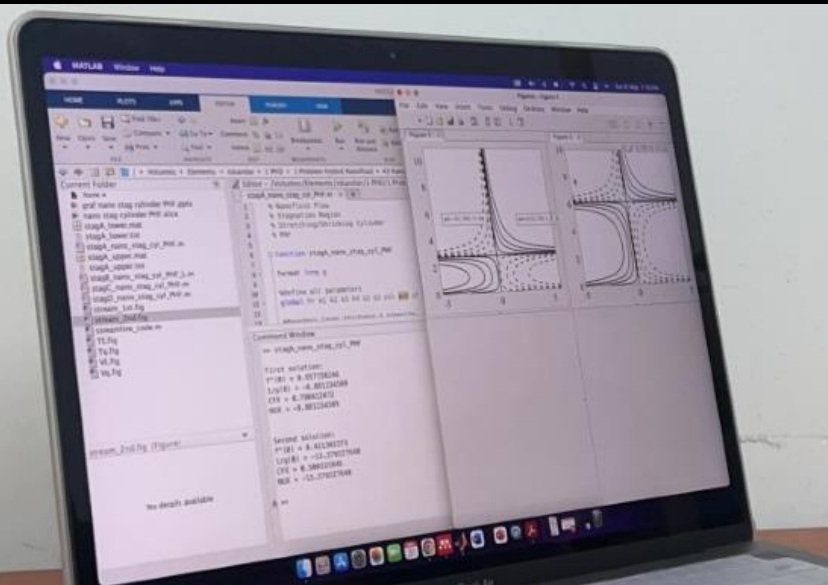
Flow configuration model of a curved surface

Thermal Performance of Hybrid Nanofluid over a Curved Surface: A Theoretical Study

Dr. Iskandar bin Waini, FTKMP

Hybrid nanofluid is utilized to signal a promising increase in the thermal performance of working fluids since this technology has resulted in a significant change in the design of thermal and cooling systems. As a result of the addition of more types of nanostructures, a fluid with better thermal conductivity has been created.

Hybrid nanofluids are used in several applications, for example, in the vehicle brake fluid, domestic refrigerator, solar water heating, transformer, and heat exchanger.

Moreover, the phenomenon of the flow on a stagnation region of a curved surface commonly occurs in aerodynamic industries and engineering applications. To name a few, such applications are polymer extrusion, drawing of plastic sheets, and wire drawing. In some situations, the flow is stagnated by a solid wall, while in other cases a free stagnation point or line exists interior to the fluid domain. In this regard, this research examines the impact of hybrid nanoparticles on the stagnation point flow towards a curved surface. The flow configuration model of a curved surface as shown in above figure. The hybrid nanofluid consists of silica (SiO_2) and alumina (Al_2O_3) nanoparticles which are dispersed into water to form SiO_2-Al_2O_3/water. The flow problem is govern by the equations of motion includes the continuity, the Navier-Stokes, and the energy equations. The results of the flow and thermal behaviour are numerically obtained via bvp4c in MATLAB software.
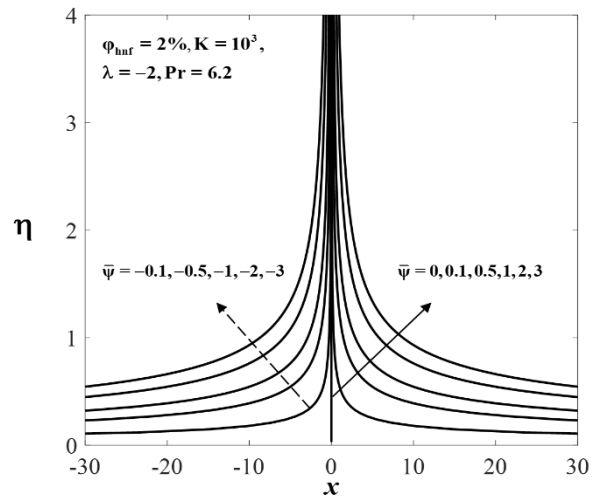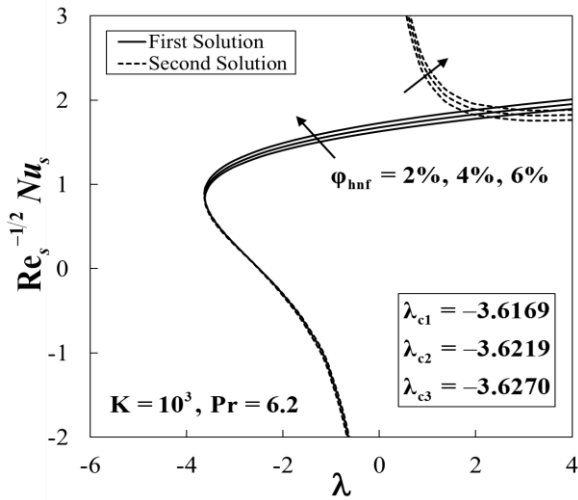
Thermal performance of SiO_2-Al_2O_3/water hybrid nanofluid

Streamlines for the first solution
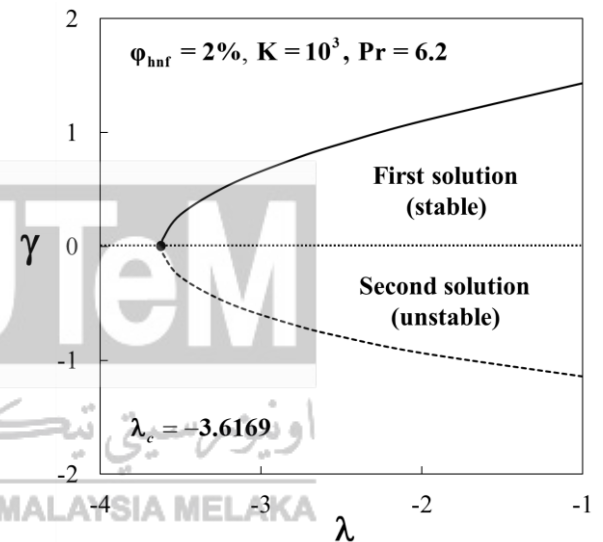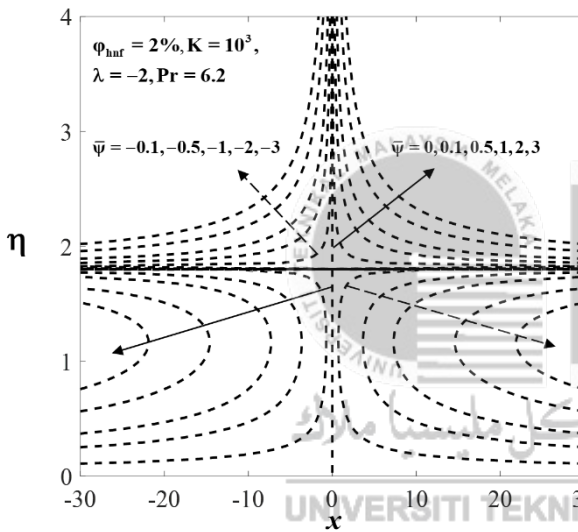
Streamlines for the second solution

The stability analysis

Outcomes discovered that the thermal performance of the fluid is improved by dispersing SiO_2-Al_2O_3 hybrid nanoparticles into the base fluid. Interestingly, the dual solutions occur in certain circumstances. Further, the dimensionless stream functions are plotted to determine the flow patterns. The flow patterns for the first solution shown that the fluid is moving away from the slot ($x = 0$) and acts as the normal stagnation point flow. Meanwhile, the flow is split into two regions for the second solution i.e. upper and lower regions. The upper region has similar patterns to those that the first solution, whereas reverse flow is observed in the lower region. Since there are dual solutions are available, thus, the stability analysis is conducted to test the stability of these solutions. It is found that the first solution is the real solution and stable as time evolves.

Details about this research work can be found in Mathematics (https://doi.org/10.3390/math9182330). This research also has been cited by several researchers in their study. Moreover, findings in this research is important in optimizing the heat transfer process. Also, the stability analysis is conducted to avoid misjudgement on flow and thermal features.

XYZ ball screw drive table

NPID ICond controller: A new control method in cutting force disturbance reduction

Dr. Mohd Nazmin bin Maslan, FKP

Machine tools play a vital role in the manufacturing industry. One of the machines widely used in the manufacturing industry is the computerized numerical control (CNC) machine, which is typically used in milling processes. An XYZ ball screw drive table is designed to emulate the milling process of the CNC machine and it is specifically used for research work, as shown in above figure. The XYZ ball screw drive table consists of three angular movements (X-, Y-, and Z-axes) to perform cutting action with a drilling mechanism. The positioning stage for each angle of the XYZ ball screw drive table is equipped with a rotary motor.　The rotary motors are operated by a control scheme based on the input signal.

Various control schemes have been used such as proportional–derivative–integral (PID) controller, sliding mode control, cascade controller, gain scheduling, and fuzzy logic controller. A controller can also combine with other controller or make some modification to form a new control algorithm depending on different types of needs. For example, a PID controller can form a Proportional-Integral-Derivative - Particle Swarm Optimization (PID-PSO) controller when combines with Particle Swarm Optimization (PSO) while it can also form a Fractional Order Proportional-Integral-Derivative (FOPID) controller by adding some parameters in the integral and derivative orders.
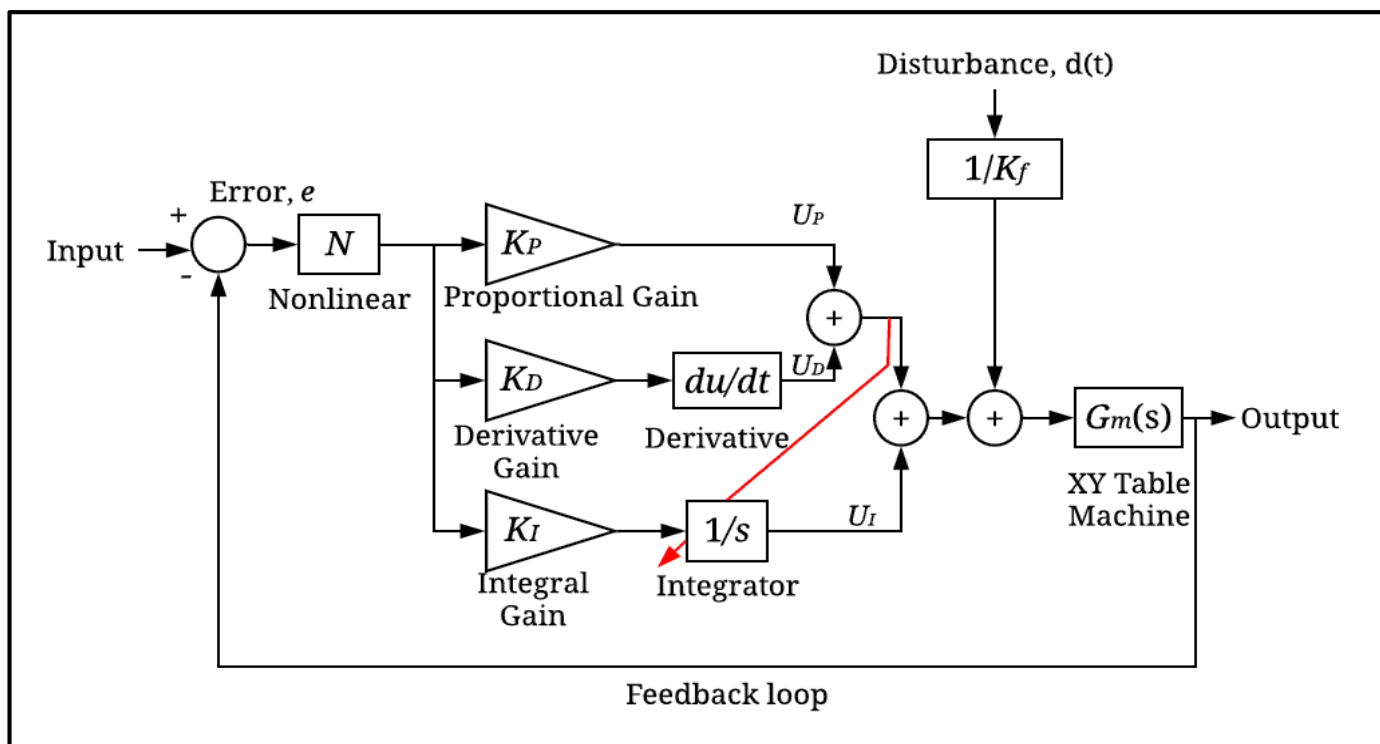
The structure of **NPID ICond controller**

In this study, a new controller is designed to compensate the disturbance force (cutting force) for an XYZ ball screw drive table. The controller is a combination of a nonlinear proportional–integral–derivative controller and conditional integrator (hereinafter **NPID ICond controller**). The integral output is based on certain conditions. The conditional integrator is responsible for controlling the steady-state error present in the system. The system can be unstable due to the 90° phase lag at all frequencies and therefore, the conditional integrator functions to compensate this problem. The conditional integrator can reduce phase lag while maintaining the steady-state error at a minimum and prevent integral wind-up. The performance of the NPID ICond controller is then evaluated and compared with the performance of a PID controller and nonlinear proportional–integral–derivative (NPID) controller in terms of the root mean square error (RMSE) and maximum tracking error (MTE). The cutting force is chosen as the disturbance force for the system.

It is believed that the findings of this study will provide insight on how the three controllers perform in compensating the disturbance force for the XYZ ball screw drive table.

This research work can be further explored in Symposium on Intelligent Manufacturing and Mechatronics 2021 (doi.org/ 10.1007/978-981-16-8954-3_8). The journal article on experimenting this NPID ICond controller will also be published in Journal of Engineering Science and Technology. The NPID ICond controller can be used in future by combining with other control method or can be used by itself with variation of applications. The research was supported by Research Acculturation of Early Career Researchers grant. The research team consists of two PhD students and two master students.

MUCET 2021

Malaysian Technical Universities Conference on Engineering and Technology (MUCET) is jointly organised by Malaysian Technical Universities Network (MTUN) comprising of UTeM, UMP, UniMAP and UTHM. UTeM was proud to host MUCET 2021 and it has been organized virtually due to the Covid-19 pandemic.

MUCET 2021 12th Edition highlighted the innovative research in science, engineering, and technology with the theme of "Sustainable Engineering & Technology Towards IR 4.0".

Sesi Penilaian Malaysia Research Assessment (MyRA) bagi tahun 2019 dan 2020 bersama juruadit peringkat Kementerian Pengajian Tinggi (KPT) pada 20 Febuari 2022. Sesi ini melibatkan CRIM sebagai urusetia dan semua pengurus data dari PTj berbeza. UTeM memperoleh penarafan 3 dan 4 bintang bagi tahun 2019 dan 2020 masing-masing berdasarkan keputusan selepas audit dalam.

Pejabat TNCPI dan CRIM telah menganjurkan Majlis Penyampaian Surat Tawaran Geran Penyelidikan Jangka Pendek (PJP) UTeM 2021. Surat Tawaran ini disampaikan oleh YBhg. Prof. Ir. Dr. Ghazali Bin Omar.

Pusat Pengurusan Penyelidikan & Inovasi (CRIM) UTeM telah menganjurkan **Bengkel Geran Penyelidikan KPT Siri I**. Tema bagi Bengkel Siri I ini ialah Penulisan & Pemurnian Kertas Cadangan FRGS 2021 dengan fokus kepada bidang Teknologi & Kejuruteraan. *[26 Januari 2021, Prof. Dr. Che Hassan bin Che Haron]*

Pusat Pengurusan Penyelidikan & Inovasi (CRIM) UTeM telah menganjurkan **Bengkel Geran Penyelidikan KPT Siri II** . Tema bagi Bengkel Siri II ini ialah Penulisan & Pemurnian Kertas Cadangan FRGS 2021 dengan fokus kepada bidang Teknologi Maklumat & Komunikasi.
[28 Januari 2021, Prof. Dr. Ku Ruhana binti Ku Mahamud]

Pusat Pengurusan Penyelidikan & Inovasi (CRIM) UTeM telah menganjurkan **Bengkel Geran Penyelidikan KPT Siri III**. Tema bengkel kali ini ialah Penghasilan Kertas Cadangan PRGS 2021.
[01 Februari 2021, Prof. Dr. Norhamidi bin Muhamad]

Pusat Pengurusan Penyelidikan & Inovasi (CRIM) UTeM telah menganjurkan **Bengkel Geran Penyelidikan KPT Siri IV** . Tema bagi Bengkel Siri IV ini ialah Penulisan & Pemurnian Kertas Cadangan FRGS 2021 dengan fokus kepada bidang Pengurusan & Sains Sosial.
[03 Februari 2021, Dr. Nurul Fadly bin Habidin]

Pusat Pengurusan Penyelidikan & Inovasi (CRIM) UTeM telah menganjurkan **Bengkel Panel Penilai Dalaman Untuk Geran Penyelidikan KPT**.
[11 Februari 2021, Prof. Dr. Norhamidi bin Muhamad]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Geran Penyelidikan Sains & Teknologi Toray Malaysia**. Dana ini merupakan geran tahunan yang dianugerahkan oleh Malaysia Toray Science Foundation.
[14 April 2021, Prof. Madya Dr. Cheng Chin Kui]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Geran Anugerah Merdeka** bagi Penempatan Antarabangsa yang diperkenalkan sejak tahun 2012. Penerima geran akan ditempatkan di institusi antarabangsa yang berprestij bagi menimba pengalaman dan kepakaran dalam bidang yang dikhususkan.
[16 April 2021, Prof. Madya Dr. Zetty Norhana Balia Yusof & Prof. Madya Dr. Ong Wee Jun]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Dana Konsortium Kecemerlangan Penyelidikan (KKP) (Domain Teknologi & Kejuruteraan)** yang bertujuan untuk memantapkan lagi kerjasama di antara CoE/kumpulan penyelidik dalam aktiviti penyelidikan bidang nic.
[20 April 2021, Prof. Dr. Che Hassan bin Che Haron]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Geran Malaysia Laboratories for Academia-Business Collaboration (MyLAB)**. Geran ini ditubuhkan oleh Kementerian Pengajian Tinggi (KPT) sebagai langkah merealisasikan jaringan kolaborasi Institusi Pendidikan Tinggi (IPT) dengan sektor industri. *[03 Mei 2021, Prof. Ir. Dr. Abdul Latif Ahmad]*

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Dana Konsortium Kecemerlangan Penyelidikan (KKP) (Domain Teknologi Maklumat Dan Komunikasi)** yang bertujuan untuk memantapkan lagi kerjasama di antara CoE/kumpulan penyelidik dalam aktiviti penyelidikan bidang nic. *[04 Mei 2021, Prof. Ts. Dr. Rosziati binti Ibrahim]*

Seksyen Strategik dan Pusat Kecemerlangan, Pusat Pengurusan Penyelidikan & Inovasi (CRIM) telah menganjurkan Sesi Taklimat bertajuk **"How To Write A High-Impact Review Paper"** bersama YBhg. Prof. Ts. Dr. Lam Su Shiung daripada Universiti Malaysia Terengganu.
[07 Julai 2021, Prof. Ts. Dr. Lam Su Shiung]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan **Siri Taklimat Dana Pembangunan Teknologi 1 & 2 (TeD1 & TED2)**. Dana ini merupakan sebahagian daripada Pembiayaan Malaysia Grand Challenge di bawah Kementerian Sains, Teknologi & Inovasi (MOSTI).
[08 Julai 2021, Prof. Madya Dr. Amir Syahir Amir Hamzah]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan Siri Bengkel CRIM bertajuk **"Journal Article: Top 5 Strategies & 12 Untold Secrets To Prevent Rejection"**
[09 Ogos 2021, Ts. ChM. Dr. Liew Rock Keey]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan Siri Taklimat Eksekutif bertajuk **"How To Write A Good Manuscript Without The Fear Of Getting Rejected"**
[20 Ogos 2021, Prof. Dr. Mohd Cairul Iqbal bin Mohd Amin]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan Siri Taklimat Eksekutif bertajuk **"Research Publication and Ethics"**
[03 November 2021, Prof. Madya Ir. Dr. Mohd Khairuddin bin Md. Arshad]

Pusat Pengurusan Penyelidikan & Inovasi UTeM telah menganjurkan Sesi Perkongsian Penyelidikan bertajuk, **"Projek Sistem Fertigasi Pintar IoT"**
[07 September 2021, Dr. Fakrulradzi bin Idris & Ir. Dr. Anas bin Abdul Latiff]

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Majlis ini bertujuan untuk menghargai dan meraikan penyelidik yang telah cemerlang serta menaikkan mutu penyelidikan UTeM bagi tahun 2021.

Senarai Anugerah Dan Pemenang

1. Anugerah Penyelidik dengan Penerbitan Artikel Jurnal Tertinggi 2021

a) Bidang Sains & Teknologi
   DR. ISKANDAR BIN WAINI
   PROF. MADYA IR. TS. DR. MOHD AZLI BIN SALIM
   NURUL AMIRA BINTI ZAINAL
 b) Bidang Bukan Sains & Teknologi
   DR. SAMER ALI HUSSEIN AL-SHAMI
   DR. NABIL HASAN SALEH AL-KUMAIM
   PROF. MADYA TS. DR. MOHAMMED HARIRI BIN BAKRI
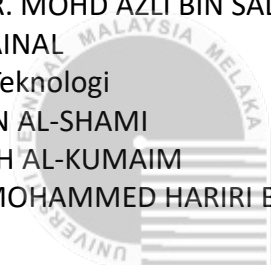
2. Anugerah PTj dengan Penerbitan Artikel Jurnal Tertinggi 2021

a) Bidang Sains & Teknologi
   FAKULTI TEKNOLOGI KEJURUTERAAN MEKANIKAL DAN PEMBUATAN (FTKMP)
b) Bidang Bukan Sains & Teknologi
   FAKULTI PENGURUSAN TEKNOLOGI DAN TEKNOUSAHAWANAN (FPTT)

3. Anugerah Penyelidik dengan Penerbitan Berimpak Tinggi 2021

a) Bidang Sains & Teknologi
   NURUL HANIM BINTI HAJI RAZAK
   Journal of Cleaner Production
   Reducing diesel exhaust emissions by optimisation of alcohol oxygenates blend with diesel/biodiesel
 b) Bidang Bukan Sains & Teknologi
   DR. SAMER ALI HUSSEIN AL-SHAMI
   Sustainability (Switzerland)
   Microcredit impact on socio-economic development and women empowerment in low-income countries: Evidence from Yemen

4. **Anugerah Penyelidik dengan Penerbitan Gabungan Afiliasi Tertinggi 2021**

PROF. MADYA IR. TS. DR. MOHD AZLI BIN SALIM

6. **Anugerah Penyelidik dengan H-Index Tertinggi 2021**

PROF. DR. MOHD KHANAPI BIN ABD GHANI
H-Index 21

7. **Anugerah Prestasi Gemilang Kumpulan Penyelidikan 2021**

a) Bidang Sains & Teknologi

PERVASIVE COMPUTING & EDUCATIONAL TECHNOLOGY (PET)
SUSTAINABLE AND RESPONSIVE MANUFACTURING (SUSREM)
MICROWAVE RESEARCH GROUP (MRG)

b. Bidang Bukan Sains & Teknologi

SUSTAINABLE ORANGE-TECH LIFE VALUE EXCELLENT (SOLVE)

8. **Anugerah Pengurusan Geran Cemerlang 2021**

a) Geran Universiti

IR. DR. SHARIN BIN AB GHANI (Ketua Penyelidik)
PROF. MADYA DR. HIDAYAT BIN ZAINUDDIN
PROF. MADYA DR. NORAIHAM BINTI MOHAMAD
IR. DR. NORAZHAR BIN ABU BAKAR
IR. MUHAMMAD SYAHRANI BIN JOHAL
Characterization Study of Paper Insulation Immersed in Biodegradable and Mineral Insulating Oils for Supporting Transformer Asset Management System

DR. FARAH SHAHNAZ BINTI FEROZ (Ketua Penyelidik)
TS. NIZA BINTI MOHD IDRIS
INDRA DEVI A/P M.SUBRAMANIAM
PROF. IR. DR. KENNETH A/L SUNDARAJ
PROF. MADYA DR. DIANA-LEA BARANOVICH
Using Low-Cost EEG Technology for Extracting ERP Correlates to Evaluate the Impact of Public Speaking Anxiety on Cognition

TS. DR. ADAM WONG YOON KHANG (Ketua Penyelidik)
DR. ABD SHUKUR BIN JAAFAR
WIN ADIYANSYAH INDRA
DR. JAMIL ABEDALRAHIM JAMIL ALSAYAYDEH
TS. DR. MOHD SYAFIQ BIN MISPAN
Development of Self-Configure Multiple Data Rate Control for Last Mile Mobile Hybrid Optical Wireless Access Network

b) Geran Luar

DR. MOHD HENDRA BIN HAIRI (Ketua Penyelidik)
PROF. MADYA GAN CHIN KIM
PROF. MADYA DR. HIDAYAT BIN ZAINUDDIN
DR. AHMAD SADHIQIN BIN MOHD ISIRA
IR. MOHD KHAIRI BIN MOHD ZAMBRI
DR. FARHAN BIN HANAFFI
ANNUR ZIKRI BIN JIDIN
Integrated ROCOF Islanding Detection Method for Synchronous-typed DG (FRGS)

DR. MUHAMMAD ILMAN HAKIMI CHUA BIN ABDULLAH (Ketua Penyelidik)
PROF. TS. DR. NOREFFENDY BIN TAMALDIN
DR. FAIZ REDZA BIN RAMLI
HILMI BIN AMIRUDDIN
PROF. MADYA DR. MOHD FADZLI BIN ABDOLLAH
Correlation of Mechanical-Material Properties and Tribological Behaviour of 3D-printed
object with internal geometrical structure (FRGS)

PROFESOR MADYA IR. TS. DR. MOHD SHUKOR BIN SALLEH (Ketua Penyelidik)
TS. ZOLKARNAIN BIN MARJOM
PROF. MADYA DR. MOHD AMRI BIN SULAIMAN
PROF. MADYA IR. DR. MOHD HADZLEY BIN ABU BAKAR
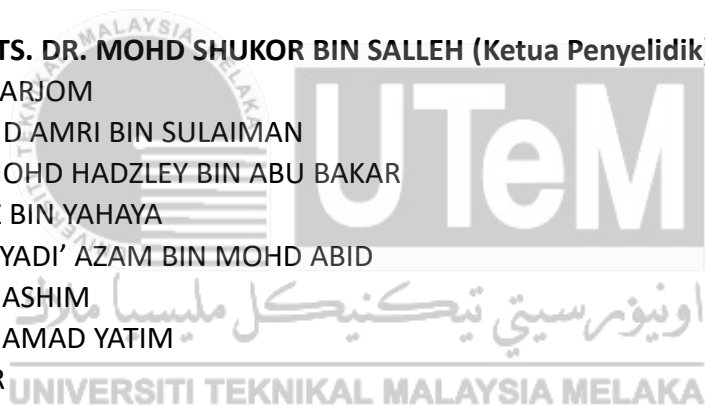TS. DR. SAIFUDIN HAFIZ BIN YAHAYA
PROF. IR. DR. MOHD ASYADI' AZAM BIN MOHD ABID
TS. DR. HANIZAM BIN HASHIM
NORAZLINA BINTI MOHAMAD YATIM
MOHD ZAIDI BIN OMAR
New Processing Approach on the Microstructural and Mechanical Properties of Thixoformed Multi-
walled CNT Reinforced Aluminium Matrix Composite (FRGS)

9. Anugerah Geran Penyelidikan Berimpak 2021

PROF. MADYA DR. LIM KIM CHUAN (Ketua Penyelidik)
PROF. MADYA DR. SOO YEW GUAN
DR. CHENG SEE YUAN
TS. DR. SAZALINSYAH BIN RAZALI
IR. TS. DR. RANJIT SINGH A/L SARBAN SINGH
IR. TS. DR. SITI AISYAH BINTI ANAS
MA TIEN CHOON
PROFESOR DR. ZULKALNAIN BIN MOHD YUSSOF
Ai Traffic Melaka – Fourth Industrial Revolution Approach In Optimizing Traffic Light Signal (Geran Sepadan MTUN)

PROF. MADYA IR. TS. DR. MOHD AZLI BIN SALIM (Ketua Penyelidik)
PROF. TS. DR. NOREFFENDY BIN TAMALDIN
PROF. MADYA DR. NOR AZMMI BIN MASRIPAN
ANITA AKMAR BINTI KAMAROLZAMAN
PROF. MADYA DR. MUHD RIDZUAN BIN MANSOR
ADZNI BIN MD. SAAD
IR. TS. DR. MOHD ZAID BIN AKOP
FAIZIL BIN WASBARI
PROF. MADYA DR. NURFAIZEY BIN ABDUL HAMID
DR. NADLENE BINTI RAZALI
PROF. IR. TS. DR. GHAZALI BIN OMAR
Development Of A Semi-Automatic Cone Laying And Picking Machine For Maintenance And Emergency Use (Geran Sepadan MTUN)

10. Anugerah Geran Khas Berimpak 2021

PROF. MADYA IR. TS. DR. ABDUL RAHIM BIN ABDULLAH (Ketua Penyelidik)
PROF. MADYA DR. HASLINDA BINTI MUSA
MOHD BAZLI BIN BAHAR
MOHD YUSRI BIN JAMIL
SHAMSUDIN BIN ITHNIN
Solar Powered Electric Trishaw (Geran eBECA - YIM)

PROFESOR TS. DR. MASSILA BINTI KAMALRUDIN (Ketua Penyelidik)
PROF. MADYA DR. SAFIAH BINTI SIDEK
PROF. MADYA TS. DR. MOHD FAIZAL BIN ABDOLLAH
Software Security readiness Index for Remote Working in Malaysian Public Sectors (Geran Khas KPT – Covid19)

11. Anugerah Penyelidik dengan Bilangan Geran Aktif Tertinggi 2021

IR.TS. DR. ANUAR BIN MOHAMED KASSIM
5 geran aktif

12. Anugerah Penyelidik dengan Nilai Geran Baru Tertinggi 2021

IR. DR. MOHD SHUKRI BIN YOB

Development Of Extendable Bundle Puller for Refinery Plant (RM400,000)

13. Anugerah PTj dengan Bilangan Geran Baru Tertinggi 2021

FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)
Jumlah 14 geran

14. Anugerah Khas Pencapaian Kecemerlangan Penyelidikan 2021

PROF. DR. ZAHRILADHA BIN ZAKARIA
Penerima Top Research Scientists Malaysia oleh Akademi Sains Malaysia

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