



VOL. 1 NO.1 AUGUST 2019

E-ISSN 2686-3278

PROCEEDINGS OF THE

**CONFERENCE ON
MANAGEMENT AND
ENGINEERING IN
INDUSTRY (CMEI)**



TANGERANG, 10 AUGUST 2019



**MASTER OF MECHANICAL ENGINEERING
SWISS GERMAN UNIVERSITY**

Preface from the Chairman of the Conference on Management and Engineering in Industry (CMEI)

Dena Hendriana, B.Sc., S.M., Sc.D.

Head Department of Master of Mechanical Engineering,

Faculty of Engineering and Information Technology, Swiss German University

Welcome to the first Conference on Management and Engineering in Industry (CMEI). This conference is conducted by Master of Mechanical Engineering in the Swiss German University at Alam Sutera, Tangerang, Indonesia. The conference is open for all academic community to share the knowledge in the areas of management and engineering which are applicable in the industry. It is held on Saturday, 10 August 2019 in the campus of Swiss German University at Prominence Tower, Alam Sutera. The theme of this conference is "Opportunities and Challenges of Industrial Revolution 4.0". This theme is aligned with Master of Mechanical Engineering vision and mission to prepare our students for the era of Industry 4.0 in the global economic.

There are thirteen papers presented in this event with the topics related to the theme. We thank reviewers who have been working hard to improve the quality of the papers until this conference proceeding ready to be published on time. We thank all the members of the committee who prepare and run the event. We thank Rector, Vice Rectors, and Dean of Faculty of Engineering and Information Technology for their support on this event.

We thank God that we have run the event of the conference smoothly and published the conference proceeding on time. We hope that this event is beneficial for everybody and also the proceeding to be beneficial for the readers.

Best Wishes,

Dena Hendriana, B.Sc., S.M., Sc.D.

Editorial Team

Advisors	:	Dr. Maulahikmah Galinium, S.Kom., M.Sc. Dr. Ir. Gembong Baskoro, M.Sc Dena Hendriana, BSc., S.M., Sc.D.
Chief Editor	:	Aulia Arif Iskandar, S.T., M.T.
Secretariat	:	St. Ayu Diana Lestari, S.Pd.
Treasurer	:	Anis Choirunnisa, M.Kom
IT Support for e-Journal	:	Maria Lamury, S.S., M.P. Billy Siagian, S.Kom

Contents

Preface from the Chairman of CMEI	i
Editorial Team	ii
Adatable Industrial 4.0: An Improvement Detected Obsolete Bushing Condition on Rubber Curing Machine Industry, Purwanto et al.	1
Analysis of Motor Speed Effect on Winding Tension in the Wind Up Calendering Process, Sugiyarto and Setiawan, W.	5
Design and Simulation of Engine Operation Temperature Monitor and Control System by Using Internet of Things, Sembiring et al.	9
Design and Simulation of Water Level Monitoring and Control System in Mini Hydro Power Plant, Mulyono	13
Design Improvement and Vibration Analysis of Gantry System using Finite Element Method (FEM), Putra et al.	17
Development of Electronic Cam Motion Control for Synchronous Cutting System, Setiadi, A. and Berchmans, H.J.	22
Design of Fuzzy Logic Controller for Charging System with Temperature Condition System in Excavator, Wijaya, F.	27
Design, Simulation and Implementation Monitoring System for System Control C4 Feeding Pump for Feed Vaporization in the Butadiene Plant, Yunistyawan et al.	31
Fuel Filter Data Monitoring and Auto Switching at Komatsu Engine with Arduino to Improve Life Cycle Time Main Fuel Filter Usage, Subekti et al.	36
Investigation Sound Frequency of Tire Failure in Drum Test Machine, Priyono et al.	40
Pressure Pattern Improvement of Proportional Valve Application on Hot press Machine Using PID, Stevanus et al.	44

Prototype Design of Speed Detection Mobile Application for Golfer's Swing Movement using Computer Vision Compared to Portable Radar and Accelerometer Systems, <i>Wibowo et al.</i>	49
Stray Pin Capacitance Effects on Signal Reading Coupled by Optocoupler on Microcontroller Boards, <i>Rumawas et al.</i> . .	53

Design Improvement and Vibration Analysis of Gantry System using Finite Element Method (FEM)

Faris A. Putra

Department of Mechanical Engineering

Swiss German University

Tangerang 15143, Indonesia

Email: aris.aditya.p@gmail.com

Dena Hendriana

Department of Mechanical Engineering

Swiss German University

Tangerang 15143, Indonesia

Hanny J. Berchmans

Department of Mechanical Engineering

Swiss German University

Tangerang 15143, Indonesia

Abstract—A Gantry or linear robot is an industrial robot that move in straight line in three axes and at right angles to each other. Its structure must be able to hold the vibration depends on its function because vibration behaviour and natural frequency plays a key role to every system in dynamic analysis, which can cause the system failure. Finite Element Method (FEM) and gyroscope can be used to analyze the vibration and natural frequency, it is very important to improve the design to avoid system failure. Gantry system in PT. Akebono Brake Astra Indonesia has un-rigid structure and contain too much vibration. The system was designed in 3D CAD by Solidworks software and analyzed using frequency analysis, then comparing the result with experimental result using accelerometer gyroscope to know the validity of the model. Design improvement is conducted to improve the vibration system by increasing their natural frequency. From the improvement result, the natural frequency increased in every mode shape, mode 1: from 16,559 Hz become 23,56 Hz; mode 2: from 17,903 Hz become 30,967 Hz; mode 3: from 55,856 Hz become 60,715 Hz; mode 4: from 73,804 Hz become 82,266 Hz; mode 5: from 88,367 Hz become 97,477 Hz.

Keywords: Gantry, Vibration, Natural Frequency, Mode Shape, Finite Element Method.

I. INTRODUCTION

A Gantry or linear robot (also known Cartesian coordinate robot) is an industrial robot that move in straight line rather than rotate in three axes and at right angles to each other. The wrist with three sliding joints can move back-forth, in-out, and up-down. This mechanical system is to simplifies the robot arm system, and in the end of the wrist can be combined with gripper, magnet, vacuum, and etc. In industrial, the gantry system usually use for pick and place, CNC Machines, and 3D printing. Every structure must be able to hold the load and vibration depends on its function. Once a structure design finished, the strength and stiffness must be analyzed to ensure that it is fulfill the requirements. To analyze the structure, it should be given a load and vibration in certain locations so the displacement and frequency will be found used structural analysis theory. The structure can be redesigned to determine the weight and the size of each members depends on the analysis result [5].

Design is very important to make a product, it is the main aspect to make World-Competitive Product. High Quality Product design will have three major impacts on the product

result. The first major impact of design is on manufactured cost of the product, easier the product to be made, so the manufacture process will be cheaper and it will reduce the cost of product. The second major impact of design is on product quality, it determines the durability and the function of the product itself in the best performance or not. The product can be made without defect, so it can avoid unnecessary cost. The last major impact is on product cycle time, it affect on process time required to produce a new product, reduce Man Hour, and reduce over time cost. The longer a product is available for sale, the faster can fulfill customers order, the more sales and profits there will be [4].

Finite Element Methods is a numerical procedure that is widely used to overcome computer-based problems or techniques to do an analysis in engineering design and used to complete the process of Computer-Aided Design (CAD). The study of MEH has developed very rapidly and has become a necessity for the scientific world now which can be widely used. In the beginning, FEM analyze the mechanical structure, but now it can be used to analyze heat transfer, fluid flows, and vibration [2].

II. LITERATURE REVIEW

The frame structure is very important thing for every system, it is the key to get the best quality, durability, and safety of the system. The frame structure is the place where every components of a system placed, so it must be able to accept all types of loading and vibration that occurs. The frame structure has variety of responses to vibration, to find out the response can be done in some ways, use Finite Element Method (FEM) simulation softwares and data acquisition using gyroscope.

A. Solidworks

One of the most important method in technology research and science are modelling process and simulation. Solidworks is a parasolid based modelling software and uses a parametric feature based to make assemblies and models. The Solidworks simulation allow the designers to verify the strength and safety of assemblies or models. The Solidworks simulation has provided features that allow to using Finite Element Method

(FEM), so it can simulate stress and strain of structures, flow of fluid, heat, fatigue, vibration, and others [6].

B. Accelerometer Gyroscope

An accelerometer gyroscope is a device or sensor made from spinning disc or wheel mechanism to measure and maintain orientation that harnesses the principle of momentum. The orientation will changes in response to an external torque and different direction, and it would cooperate with high rate of spin and inertia of the disc without the large angular momentum. Since the gyroscope can calculate the rotation and orientation, designers has developed it into modern technology. The gyroscope can integrate more accurate recognition of movement within a 3D Space, it combined with accelerometer for more robust direction and motion sensing. Applications of gyroscope are navigation system, virtual reality, and smartphone [12].

Accelerometer Gyroscope which will be used is The MPU-6050 GY-521, its contains 16-bits analog to digital conversion and include an accelerometer and a gyro in a single chip which make it accurate, it read the x, y, and z channel at the same time and uses the I²C-bus to interface with the Arduino. The specification of Accelerometer Gyroscope:

- Use the chip: MPU-6050.
- Power supply: 3-5v (internal low dropout regulator).
- Communication modes: standard I²C communications protocol.
- Chip built-in 16bit AD converter, 16-bit data output.
- Immersion Gold PCB machine welding process to ensure quality.
- 3-Axis angular rate sensor (gyro) with a sensitivity up to 131 LSBs/dps and a full-scale range of ± 250 , ± 500 , ± 1000 , and ± 2000 dps
- 3-Axis accelerometer with a programmable full scale range of $\pm 2g$, $\pm 4g$, $\pm 8g$ and $\pm 16g$

C. Mode Shape

Mode shape is a function defined over a structure which describes the relative displacement of any point on the structure as the structure vibrates in a single mode, every vibration have influence on the mode shapes. Every mode shape has its unique natural frequency, it means mode shape associated with each natural frequency of a structure. The measurement location of mode shape is the main concern, because there are areas with zero-displacement that sensor should not be placed on it [3].

D. Validation

Validation is very important to prove that the simulation which is being processed is correct. Simple model is enough to be simulated, and the result will be compared with theoretical calculation. The simplest model that can be analyzed is a beam, the boundary condition for the transverse vibration of a beam can be seen in Figure 1.

First of all, we must know the cross section area of a beam

$$A = b \times h \quad (1)$$







End Conditions of Beam	Frequency Equation	Mode Shape (Normal Function)	Value of β_l
	$\sin \beta_l l = 0$	$W_d(x) = C_d \sin \beta_l x$	$\beta_l = \pi$ $\beta_l = 2\pi$ $\beta_l = 3\pi$ $\beta_l = 4\pi$
	$\cos \beta_l l \cdot \cosh \beta_l l = 1$	$W_d(x) = C_d [\sin \beta_l x + \sinh \beta_l x + \alpha_n (\cos \beta_l x + \cosh \beta_l x)]$ where $\alpha_n = \frac{(\sin \beta_l l - \sinh \beta_l l)}{(\cos \beta_l l - \cosh \beta_l l)}$	$\beta_l = 4.730041$ $\beta_l = 7.853205$ $\beta_l = 10.995608$ $\beta_l = 14.137165$ $(\beta_l = 0 \text{ for rigid-body mode})$
	$\cos \beta_l l \cdot \cosh \beta_l l = -1$	$W_d(x) = C_d [\sin \beta_l x - \sinh \beta_l x + \alpha_n (\cos \beta_l x - \cosh \beta_l x)]$ where $\alpha_n = \frac{(\sinh \beta_l l - \sin \beta_l l)}{(\cos \beta_l l - \cosh \beta_l l)}$	$\beta_l = 4.730041$ $\beta_l = 7.853205$ $\beta_l = 10.995608$ $\beta_l = 14.137165$
	$\cos \beta_l l \cdot \cosh \beta_l l = -1$	$W_d(x) = C_d [\sin \beta_l x - \sinh \beta_l x - \alpha_n (\cos \beta_l x - \cosh \beta_l x)]$ where $\alpha_n = \frac{(\sin \beta_l l + \sinh \beta_l l)}{(\cos \beta_l l + \cosh \beta_l l)}$	$\beta_l = 1.875104$ $\beta_l = 4.694091$ $\beta_l = 7.854737$ $\beta_l = 10.995541$
	$\tan \beta_l l - \tanh \beta_l l = 0$	$W_d(x) = C_d [\sin \beta_l x - \sinh \beta_l x + \alpha_n (\cosh \beta_l x - \cos \beta_l x)]$ where $\alpha_n = \frac{(\sin \beta_l l - \sinh \beta_l l)}{(\cos \beta_l l - \cosh \beta_l l)}$	$\beta_l = 3.926602$ $\beta_l = 7.988383$ $\beta_l = 10.210176$ $\beta_l = 13.351768$
	$\tan \beta_l l - \tanh \beta_l l = 0$	$W_d(x) = C_d [\sin \beta_l x + \alpha_n \sinh \beta_l x]$ where $\alpha_n = \frac{(\sin \beta_l l)}{(\sinh \beta_l l)}$	$\beta_l = 3.926602$ $\beta_l = 7.988383$ $\beta_l = 10.210176$ $\beta_l = 13.351768$ $(\beta_l = 0 \text{ for rigid-body mode})$

Fig. 1. Boundary condition for the transverse vibration of a beam.

. Second, after we get the cross section area value, the moment of inertia and mass of a beam can be known by

$$I = b \times h^3 \times 12^{-1} \quad (2)$$

$$m = \rho \times A \times l \quad (3)$$

Third, we can get the stiffness of a beam from the moment of inertia before

$$k = E \times I \times l^{-3} \quad (4)$$

Last, the natural frequency equation of a beam will become:

$$\omega_n = (\beta_n \times l)^2 \times (k \times m^{-1})^{\frac{1}{2}} \quad (5)$$

$$f_n = \omega_n (2\pi)^{-1} \quad (6)$$

where: b = Cross section base (m), h = Cross section height (m), l = Length of beam (m), ρ = Density (kg/m^3), A = Cross section area (m^2), I = Moment of Inertia (m^4), E = Modulus Young (N/m^2), k = Stiffness (N/m), ω_n = Natural frequency (Rad/s), f = Natural frequency (Hz).

E. Arduino

The Arduino Mega2560 is a microcontroller board based on ATmega 2560, it has 54 digital input/output pins, 16 analog inputs, a 16MHz crystal oscillator, 4 UARTs, a power jack, a USB connection, an ICSP header, and a reset button. It is powered by the USB connection or external supply such as battery and adapter. The adapter can be connected into boards power jack by plugging a 2.1mm center positive plug [1].

TABLE I
COMPARISON BETWEEN SIMULATION AND THEORETICAL CALCULATION
IN FIRST DIMENSION

Dimension (b x h x l)	Fixtures	Mode Shape	Frequency (Hz) By Theoretical	Frequency (Hz) By Simulation	Difference
0.01m x 0.01m x 1m	Fixed - Free	Mode 1	8.439	8.439	0.00%
		Mode 2	52.886	52.864	0.04%
		Mode 3	148.083	147.910	0.12%
		Mode 4	290.184	289.530	0.23%
	Fixed - Fixed	Mode 1	53.669	53.694	-0.05%
		Mode 2	148.025	147.880	0.10%
		Mode 3	290.187	289.560	0.22%
		Mode 4	479.694	477.930	0.37%

TABLE II
COMPARISON BETWEEN SIMULATION AND THEORETICAL CALCULATION
IN SECOND DIMENSION

Dimension (b x h x l)	Fixtures	Mode Shape	Frequency (Hz) By Theoretical	Frequency (Hz) By Simulation	Difference
0.02m x 0.02m x 1m	Fixed - Free	Mode 1	16.860	16.882	-0.13%
		Mode 2	105.657	105.600	0.05%
		Mode 3	295.842	284.810	3.73%
		Mode 4	579.733	575.240	0.78%
	Fixed - Fixed	Mode 1	107.280	107.260	0.02%
		Mode 2	295.730	294.630	0.37%
		Mode 3	579.740	574.910	0.83%
		Mode 4	958.340	944.800	1.41%

F. PLX-DAQ

PLX-DAQ is an add-on software of Microsoft Excel, which has the function to export data from sensor that connect to any microcontrollers to excel, it can update the data in excel automatically based on the output of microcontrollers in real-time [13].

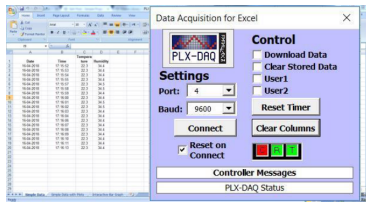


Fig. 2. PLX-DAQ connect with Microsoft excel.

III. RESULT AND DISCUSSION

A. Validation Result

The validation of this research will compare the simulation result and theoretical result using simple model, in this case uses beam as a model. There are 2 simple model of beams with different dimensions, the first model is (10x10x1000)mm beam, and the second model is (20x20x1000)mm beam. Every model will be analyzed in 2 boundary condition, the first condition is fixed-free ends, and the second condition is fixed-fixed ends. The material used by a beam is alloy steel, and its material properties are based on Solidworks data of material. Its Modulus Young (E) = $2,1 \times 10^{11} N/m^2$ and density (ρ) = $7.700 kg/m^3$. From simulation and theoretical calculation with all models in all conditions, the difference value result can be compared in Table I.

The average difference between simulation and theoretical calculation is 0.51% caused by simplification of calculation method, it means that the simulation result with Solidworks software is valid.

TABLE III
NATURAL FREQUENCY OF ACTUAL SYSTEM

Mode No.	Frequency (Rad/sec)	Frequency (Hertz)	Period (Seconds)
1	104.04	16.559	0.060391
2	112.49	17.903	0.055855
3	350.96	55.856	0.017903
4	463.73	73.804	0.013549
5	555.22	88.367	0.011316

B. Actual Design

The system that will be analyzed in this research is only the arm of the gantry in PT. Akebono Brake Astra Indonesia, These are the actual design of the arm of gantry system:

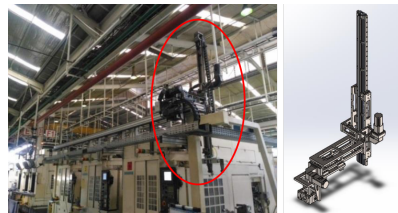


Fig. 3. Gantry system that will be analyzed and the 3D Design of gantry system.

C. Simulation Result of Actual Design

The output of this simulation are Natural frequency in 5 modes using Solidworks software. From the mode itself, which parts that need to be improved can be known based on the natural frequency. These simulation result of 5 Modes Shape can be seen in Table III.

Based on Table IV, there are conclusions that can be analyzed for further research: 1. The lowest natural frequency of actual system is in first and second mode. 2. The highest amplitude in x direction located in the fifth mode. 3. The

TABLE IV
 AMPLITUDE OF ACTUAL SYSTEM

Mode	X direction	Y direction	Z direction	Resultant
1	5.482E-02	3.170E-03	2.234E-02	3.218E-01
2	1.769E-03	3.840E-01	4.136E-03	3.847E-01
3	3.229E-02	1.372E-01	7.871E-02	3.126E-01
4	1.596E-01	1.473E-01	1.758E-01	2.653E-01
5	1.940E-01	4.471E-02	1.549E-02	2.284E-01

highest amplitude in y direction located in the second mode. 4. The highest amplitude in z direction located in the fourth mode. 5. The highest resultant amplitude located in the second mode. From conclusions above, it means the natural frequency in the first and second mode must be improved because the value is too low located on the top of gantry, and the amplitude from the first until sixth mode must be improved because the value is too high.

D. Data acquisition of actual system

Before improving the actual system to increase the natural frequency value, real data must be acquired with accelerometer gyroscope GY-521 sensor (Fig.4). The sensor will be placed in the place which has the highest resultant amplitude in first and second mode then connect to arduino and note book to do data acquisition. To get the amplitude data in real time and convert it to excel format, use PLX-DAQ software. Some program in arduino need to be modified, so the PLX-DAQ can transfer the data from arduino to excel. The data will be taken when the system running in one cycle, so the highest amplitude can be known in certain position.

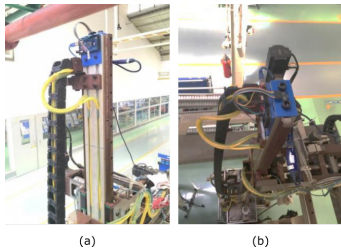


Fig. 4. (a) Arduino attached on the top of the arm of gantry. (b) Accelerometer Gyroscope attached on the top of the arm of gantry.

E. Visualization in Matlab

Data acquisition result must be converted to MATLAB software to get the value of frequency, then plot every X, Y, and Z direction data using Window Visualization Tool (wvtool). The result of visualization in Matlab can be seen in Figure 5.

From visualization above, frequency result will be known in X, Y, and Z-direction. The comparison between simulation and experimental can be seen in Table V.

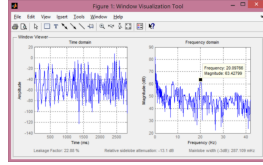


Fig. 5. Data acquisition visualization in Matlab.

 TABLE V
 COMPARISON OF SIMULATION AND EXPERIMENTAL RESULT.

Simulation Mode	Gyroscope			Accelerometer			
	X	Y	Z	X	Y	Z	
1	2	20,09Hz	20,09Hz	19,85Hz	20,18Hz	8,86Hz	20,18Hz

Mode 1 is in the same direction with Y-direction and mode 2 is in the same direction with X-direction. The difference between simulation using solidworks software and experimental using accelerometer gyroscope result is about 3,53Hz in Y-direction, and 2,19 in X-direction.

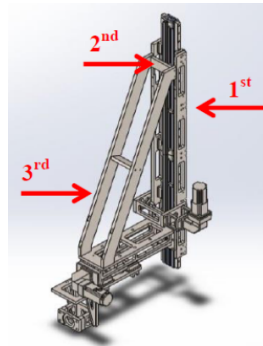


Fig. 6. After four improvement design.

F. Design Improvement

From analysis result of actual system, the natural frequency in first and second mode need to be improved, so the value will increase. In this case, the part of the system which is need to be improved is the arm of the gantry. There are 4 optional solution to solve this problem, the counter measures will be shown below:

- 1) The first solution of design improvement is cut the arm of gantry about 400mm to shorten the length of the arm because it will reduce the distance between the gripped area by linear guide and the top of the arm, so the moment will decrease ($M = F \times r$).

TABLE VI
 MANUFACTURE PROCESS COMPARISON OF ACTUAL AND DESIGN
 IMPROVEMENT

Solution No.	Cost of Material	Weight of System (Kg)	Working Days
Actual	-	-	-
1	Rp.30.000,-(4)	130(4)	1(4)
2	Rp.4.174.696,-(3)	144(3)	6(3)
3	Rp.10.841.576,-(2)	158(2)	8(2)
4	Rp.19.066.384,-(1)	197(1)	11(1)

- The second solution of design improvement is make the holder of the arm longer about 400mm. it will reduce the distance between the gripped area by linear guide and the top of the arm, so the moment will decrease ($M = F \times r$).
- The third solution of design improvement is make the holder of the arm longer about 400mm, then give ribs which connect the holder with the base to reduce the moment in X direction.
- The fourth solution of design improvement is make the holder of the arm longer until covering all of the arm itself. Then give ribs which connect the holder with the base to reduce the moment in X direction.

IV. CONCLUSIONS

From simulation by using solidworks software and experimental by using accelerometer and gyroscope sensor before, the conclusions will be summarized as (i) the natural frequency of actual system in first and second mode need to be improved, because the value is too low, (ii) the difference between simulation and theoretical result is 0,51%, it means that the simulation result with Solidworks software is valid, (iii) From data acquisition of actual system, the high vibration happen when the arm of gantry is in the lowest position while ungrasp the jig from gripper, and when the arm of gantry just starting to move or just stop from moving, (iv) the difference between simulation using solidworks software and experimental using accelerometer gyroscope result is about 3,53Hz in Y-direction and 2,19 in X-direction. The different result happened, because simulation result was not affected by another vibration except the system only (ideal condition), so the result of experimental higher than simulation, and (v) the best design improvement for actual system to increase natural frequency based on simulation result is the first solution, its natural frequency in the first mode increase about 7,0001 Hertz, and in the second mode increase about 13,064 Hertz.

REFERENCES

- [1] Bharath, V.G., 2017, *Motion Modeling of Virtual Reality Welding*, International Journal of Advance in Scientific Research and Engineering (IJASRE).
- [2] Bathe, K.J., 2014, *Finite Element Procedures*, 2nd Edition, Prentice Hall, New Jersey.
- [3] Blevins, R.D., 2001, *Formulas for Natural Frequency and Mode Shape*, Litton Educational Publishing, United States of America.

- [4] Dieter, G.E., & Schmidt, L.C., 2009, *Engineering Design*, 4th Edition, McGraw-Hill, New York.
- [5] Hibbeler, R.C., 2012, *Structural Analysis*, 8th Edition, Prentice Hall, New Jersey.
- [6] Hubalovsky, S., 2012, *Modeling, Simulation, and Visualization of Static Mechanical Properties of Frame of Elevator Cab*, International Journal of Mathematical Models and Methods in Applied Science.
- [7] Kelly, S.G., 2012, *Mechanical Vibration Theory and Application*, Cengage Learning, Stamford.
- [8] Kumar, V., Singh, K.K., & Gaurav, S., 2015, *Analysis of Natural Frequencies for Cantilever Beam with I- and T- Section Using Ansys*, International Research Journal of Engineering and Technology (IRJET).
- [9] Kurowski, M.P., 2018, *Vibration Analysis with Solidworks Simulation 2018*, SDC Publication, United States of America.
- [10] Nail, B.G., 2013, *Pan & Tilt Motion Based Gyro Controlled Firing Gun*, International Journal of Latest Research in Engineering and Technology (IJLRET).
- [11] Rao, S.S., *Mechanical Vibrations*, 5th Edition, Prentice Hall, New Jersey.



CMEI
Conference on Management and Engineering in Industry

CMEI-2019

CALL FOR PAPERS

Conference on Management and Engineering in Industry

10 August 2019 at SGU, Tangerang

In conjunction with the SGU's 6th ACMIT, the **Master of Mechanical Engineering (MME)** will conduct their first annual conference called Conference on Management and Engineering in Industry (CMEI). The theme of the conference is "**Applied Technology Towards Industry 4.0**" and also open for related research topics, such as:

- Robotics
- Sensors and Actuators
- Intelligent System
- Instrumentation
- Knowledge Management
- Machine Learning
- Innovation Technology Management
- Mechatronics

Important Dates:

Full Paper Submission: 19 July 2019

Acceptance Results: 26 July 2019

Re-submission for Camera Ready: 3 August 2019

For more details, please send an email to the conference committee cmei.sgu@gmail.com

