LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW* KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Investigations into the effects of maximum deflection in low stiffness resilient shaft of Semi			
		Active Steering System			
Jumlah Penulis	:	4 orang (Roslina Ab. Rashid, Joga D. Setiawan, M. Maharun and M. B. Baharom)			
Status Pengusul	:	Penulis ke-2 (Penulis Korespondensi)			
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	ARPN Journal of Engineering and Applied Sciences	
		b. Nomor ISSN	:	18196608	
		c. Vol, No., Bln Thn	:	Volume 11, Issue 22, 2016	
		d. Penerbit	:	Asian Research Publishing Network	
	1	e. DOI artikel (jika ada)	:		
		f. Alamat web jurnal	:	http://www.arpnjournals.com/jeas/index.htm	
		Alamat Artikel	:	http://www.arpnjournals.com/jeas/volume 22 2016.ht	
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		g. Terindex	:	Scopus	
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Total = (100%)	37,00	37,00	37,00	
Nilai Pengusul = (40% x 37.00) = 14.80				

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Semarang, 1 Juni 2021

Reviewer 2

Ojo Kyirdi, Ph.D NIP. 197303171999031001 Unit Kerja : Departemen Teknik Mesin FT UNDIP

LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Investigations into the effects of maximum deflection in low stiffness resilient shaft of Semi Active Steering System Jumlah Penulis 4 orang (Roslina Ab. Rashid, Joga D. Setiawan, M. Maharun and M. B. Baharom) Penulis ke-2 (Penulis Korespondensi) Status Pengusul : Identitas Jurnal Ilmiah Nama Jurnal ARPN Journal of Engineering and Applied Sciences a. ٠ Nomor ISSN 18196608 b. : Vol, No., Bln Thn Volume 11, Issue 22, 2016 C. : d. Penerbit Asian Research Publishing Network : e. DOI artikel (jika ada) f. Alamat web jurnal http://www.arpnjournals.com/jeas/index.htm : Alamat Artikel http://www.arpnjournals.com/jeas/volume 22 2016.h • tm Terindex • Scopus

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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12,00			10.75
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2. Ruang lingkup dan kedalaman pembahasan: Artikel ini melakukan studi pengaruh dari low-stiffness resilient shaft (LSRS) maximum deflection angle terhadap respon dari kendaraan yang dimodelkan menggunakan bycicle model. Hasil studi dibahas dan disajikan secara lengkap dan jelas.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Metode penelitian yang disusulkan sudah baik yaitu melakukan pendekatan simulasi pada pemodelan 3DOF bicycle model. Hasil studi secara simulasi menunjukkan bahwa untuk menjaga drivability, disarankan bahwa maximum sudut defleksi dari LSRS bernilai antara 10⁰ hingga 30⁰.

4. Kelengkapan unsur dan kualitas terbitan:

Kelengkapan unsur dan kualitas terbitan dari jurnal sudah baik. Jurnal ini juga terindeks oleh Scopus termasuk ketegori Q3 pada Scimago dengan nilai SJR 0.193 pada saat terbit.

Semarang, 1 Juni 2021 Reviewen 1 Eflita Yohana, Ph.D NIP. 196204281990012001

NIP. 196204281990012001 Unit Kerja : Departemen Teknik Mesin FT UNDIP

LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW* KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Investigations into the effects of maximum deflection in low stiffness resilient shaft of Semi Active Steering System			
Jumlah Penulis Status Pengusul Identitas Jurnal Ilmiah	::	 4 orang (Ro Penulis ke-2 a. Nama 1 b. Nomor c. Vol, No d. Penerb e. DOI ar f. Alamat Alamat g. Terinda 	slina Ab. Rashic 2 (Penulis Kores) furnal ISSN 5., Bln Thn it tikel (jika ada) web jurnal Artikel	l, Joş pond : : : :	ga D. Setiawan, M. Maharun and M. B. Baharom) ensi) ARPN Journal of Engineering and Applied Sciences 18196608 Volume 11, Issue 22, 2016 Asian Research Publishing Network http://www.arpnjournals.com/jeas/index.htm http://www.arpnjournals.com/jeas/volume_22_2016.ht m Scopus
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Hasil Penilaian Peer Review :

	Nilai M			
Komponen Yang Dinilai	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	Nilai Akhir Yang Diperoleh
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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12,00			11,00
Total = (100%)	40,00			37,00
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Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi jurnal:

Artikel sudah lengkap sesuai dengan panduan jurnal yang dituju yaitu ARPN Journal of Engineering and Applied Sciences (JEAS). Subtsansi penelitian yang ditulis sudah sesuai dengan bidang pengusul yaitu kontrol.

2. Ruang lingkup dan kedalaman pembahasan:

Artikel ini membahas tentang studi pengaruh sudut defleksi maksimum low-stiffness-resilient-shaft (LSRS) pada respon kendaraan yang dilengkapi oleh system Semi Active Steering System (SAS). Hasil dari studi telah diberikan dengan lengkap dan detail pada jurnal.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Metode penelitian yang diusulkan relative up-to date yaitu system dimodelkan dengan metode bicycle model dan dikembanglan dalam software MATLAB/Simulink. Hasil simulasi dalam study menunjukkan bahwa diperlukan sudut defleksi dari LSRS bernilai 10⁰ hingga 30⁰.

4. Kelengkapan unsur dan kualitas terbitan:

Kelengkapan dan kualitas terbitan sudah baik. Jurnal ini mempunyai nilai SJR 0.193 dan masuk kategori Q3 pada Scimago pada saat artikel terbit.

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sections of $0.48 \times 0.07 \times 2.0$ m, to acquire data of four different cases. The conical pins were used with three different relative height roughness, e/Dh, = 0.01636, 0.0245 and 0.0327 and one standard smooth un-protrusion flat plate absorber was used as a basis for comparison. The data for from the four test rigs were recorded simultaneously. The measurements were carried out at five inclination angles 10° , 30° , 50° , 70° , and 90° to get the optimum angle of operation for free convection solar air heater. The results show that the conical pin artificial roughness has enhanced the heat transfer rate of the solar air heater by up to 41% as compared to the un-protrusion absorber plate heat transfer rate in free convection solar air heater. The heat transfer rate and Nusselt number are highest for relative height roughness e/Dh = 0.0327. The optimum inclination angle was found to be 50 degrees, at which the solar air heater performed most efficiently.

Full Text

Title: Thermodynamic analysis on oil palm biomass Cogeneration Plant

Author (s): Nazri Talib and Mohd. Amin Abd Majid

Abstract: Growth in energy demand has become a major concern in the earth today. The shortage of main fuel derived from conventional fossil fuel has led to an increasing demand on new source of energy, the renewal energy. Renewal energy is the proven alternative to overcome these problems. For the case of palm oil mills, the palm fibre and shell are the main source of renewal energy and cogeneration are adopted in exploiting these renewal energy sources. For this case study, the potential of these renewal energy sources were being investigated using thermodynamic analysis. Sie-Manggaris Palm Oil Mill Cogeneration Plant has been selected as a case-study model. From the analysis, it was found that the available fuel, which was accounted only palm fiber and shell, was able to generate steam up to 45,000 kg h-1. This would give the potential energy production of 157 GJ h-1 and easily able to fulfill the need of the utility requirement for the entire plant. Although, the current configuration of the existing cogeneration system would impose the deficit power of 4 kWh ton FFB-1 and has to be supported using diesel generator set at the diesel consumption rate of 0.8 L ton FFB-1. The current boiler capable to convert 1 kg of fuel to 3.35 kg of steam with the turbine steam rate at 30 kg kWh-1. Retrofit design of the existing plant is necessary in order to overcome the low energy efficiency. Substantial amount of power production could be generated if utilizing the high-energy efficient equipment.

Full Text

Title: Microstructure based finite element analysis for deformation behavior of magnesium based composites

Author (s): Prasanth Kumar B., T. V. V. L. N. Rao and Masri Baharom

Abstract: In Metal matrix composites (MMC) the microstructural aspects such as reinforcement size, shape and distribution plays important role in the deformation behavior of composites. To study the thermal and structural deformation behavior of real microstructure, an analytical approach was proposed by developing a two dimensional (2D) model from a microstructure image of magnesium hybrid composites and magnesium CNT composites. Samples of both magnesium hybrid (1%CNT, 2% silicon carbide) and magnesium mono composite (1%CNT) were fabricated using stir casting method. The microstructure images of samples were converted into equivalent CAD format using canny edge detection method. In the present work the deformation behavior such as the thermal stress and strain and structural analysis were studied by using finite element analysis. Experimental tensile testing of magnesium hybrid composites was also conducted.

Full Text

- Title: Modification of epoxy with Polyaniline and its effects on cathodic disbondment factors
- Author (s): Noor Ain A. Rahman, Mokhtar Che Ismil and Zakaria Man
- Abstract: The tendency of the external coating of underground pipeline to disbonded is highly due to the service environment. The inadequate coating also becomes one of the contributing factors in the disbonded of an underground pipeline. The function and desired characteristics of an external coating are very important issues. In this work, the performance of Polyaniline (PANI) in epoxy coatings has been investigated by performing the cathodic disbonding test. Varies concentration of PANI was used to find the lowest disbonded radius. The test was carried out at two differents conditions for the comparisons purpose. The results were compared with previously stated effects of the potential, time, pH of NS4 soil solution. It was found that the cathodic disbonding radius decreased with increase the PANI content in the epoxy coating system.

Full Text

Title: Effect of irreversibility on COP of double effect steam absorption chillers

Author (s): Mohd. Amin Abd Majid, Tomohiro Nakamura, Zhang Xiaoming and Adzuieen Nordin

Abstract: Major irreversibility's in the absorption chillers are due to heat transfer between the absorption cycles and the environment. This effect also occurs for LiBr/H2O steam absorption chillers. This study investigated the effect of external heat transfer processes on LiBr/H2O steam absorption chillers installed at two district cooling plants in Malaysia. The study was done by evaluation of operating data. The heat transfer processes occurring at the desorbers, evaporators, condensers and absorbers for the absorption chillers at these two plants were investigated using reversible and zero order models. It is noted that the trends shown by the reversible and zero order models indicate the irreversibility occurred for the absorption chillers at both plants. The COPs figures for reversible and zero order models for the absorption chillers at both plants. The COPs figures of this occurrence was due to lower temperatures of returned chilled water. Hence in order to improve COP, the temperatures of returned chilled water should be increased.

Full Text

- Title: A comparative study of finite element analysis for friction stir welding application
- Author (s): Bahman Meyghani, M. Awang and S. Emamian
- Abstract: Friction stir welding (FSW) is a solid state welding technique that has been used in various industries for joining different materials which are difficult or impossible to be welded by conventional welding methods. Complexity of the geometry and a three dimensional character has made the FSW process complicated in comparison with other techniques. Therefore, theoretical study of FSW is challengeable and the governing equation prediction is challengeable. Finite element analyses of FSW can predict various parameters of the welding processes such as temperature profile, deformations, stresses, residual stress and forces. It can also help to investigate the material behavior, which can be time-consuming by using experiments. The process complexity requires the choice of the best finite element software appropriate to the results to be predicted. This paper has compared different finite element analyses which have been done for the numerical simulation of FSW. The results showed that, ABAQUS®, ANSYS® and FLUENT® software have been the most common software in those papers which have focused on FSW modeling. In the terms of mechanical properties such as thermo mechanical behavior, strain, stress and friction simulation, models created using ABAQUS

group-based nearest neighbour techniques are evaluated against existing k-nearest neighbour classifier in terms of accuracy and area under the receiver operating characteristic curve (AUC). The group-based nearest neighbour classifiers show favorable accuracy compared to the existing k-nearest neighbour classifier.

Full Text

- Title: The enhancement of Linear Regression algorithm in handling missing data for medical data set
- Author (s): Anirah Ahmad and Hasimah Hj. Mohamed

Abstract: Missing data is a common problem faced by researchers in many studies. The occurrence of missing data can produce biased results at the end of the study and affect the accuracy of the findings. There are various techniques to overcome this problem and multiple imputation technique is the best solution. Multiple imputation can provide a valid variance estimation and easy to implement. This technique can produce unbiased result and known as a very flexible, sophisticated approach and powerful technique for handling missing data. Hence the selection of the advantages of Multiple Imputation is it can use any statistical model to impute missing data. Hence the selection of the imputation model must be done properly to ensure the quality of imputation values. However the selection of imputed model is actually the critical step in Multiple Imputation. This research study a linear regression model (LR) as the selected imputation. Furthermore this research makes comparison between LR and LReHalf. The performance of LReHalf is measured by the accuracy of imputed data produced during the experiments. Future research is highly suggested to increase the performance of LReHalf model. LReHalf was recommended to enhance the quality of MI in handling missing data problems, and hopefully this model will benefits all researchers from time to time.

Full Text

Title: Internet of things technology for greenhouse monitoring and management system based on wireless sensor network

- Author (s): Ahmad Ashraf Abdul Halim, Najmuddin Mohd. Hassan, Ammar Zakaria, Latifah Munirah Kamarudin and Asyraf Hakimi Abu Bakar
- Abstract: Agrotech plays an important role in the production of out-of-season fruits, flowers and vegetable as well as high value and sensitive plants. The greenhouse concept has been widely used in precision agriculture to acquire the best quality for the production of fruits or vegetables. However a fully automated system, taking into considerations the different phases of plant growth and the optimal requirement by the plants during these growth periods and cycle is not fully designed and available. The optimal plant growth depends on several parameters such as irrigation, soil moisture, humidity, temperature, radiation of light, pH level, and CO². Thus, this project develops an automated scheduler system by considerating with all optimal plant growth requirements for every each phase of the plant to ensure that all subjects (mango) will grow perfectly. Main hardware component within project is Memsic, Zigbee and smart phone for display while MP Lab and LabView are used for software elements. It is anticipated, by using this system labor and efficient.

Full Text

- Title: A comparative analysis on feature selection techniques for classification problems
- Author (s): Munirah M. Y., Rozlini M., Nawi N. M., Wahid N. and Shukran M. A. M.
- Abstract: Feature selection has become the vital step in many data mining application for instances classification. Feature selection eliminates irrelevant attribute to obtain high quality features that may contribute in enhancing classification process and producing better classification results. This study is conducted with the intention to find out the most appropriate features that may lead to the best accuracy for various datasets of same domain, which is medical domain. During the experiments, comparisons were made between six benchmark feature selection methods based on eight medical datasets. Then, the performance were analyzed based on two machine learning algorithms; Naive Bayes and KNN with and without feature selection in term of F-Measure and ROC on those medical datasets. From the experiment the optimum feature subsets are found. Moreover, the findings effectively support the fact that feature selection helps in increasing the classifier performance with existence of minimum number of features. However, no single feature selection methods that best satisfy all datasets and learning algorithms and this will simplify by assumption that features are independent for a given class variable. Hence, it still enables to obtain the optimal dimensionality of the feature subsets within the respective medical datasets.

Full Text

Title: Performance analysis of routing protocols for Delay Tolerant Networks Author (s): Sanjay Kumar K. Suraj and Sudhakar Pandey Delay Tolerant Networks (DTNs) enable communication in challenged environments where end to end connectivity may not exist at some intervals. DTNs use store, carry and forward paradigm for delivering the message from one node to other node. Routing in DTNs is considered a challenging task because of the frequent disconnections and short contact Abstract: durations. In present paper we evaluate the performance of some popular routing protocols used in DTNs based on characteristics like delivery probability, delivery latency and overhead ratio. Evaluating the performance of routing protocol requires suitable simulation tool so that the parameters used in simulation may be varied widely and the evaluated performance gives the result closer to the real world scenario. We used ONE (Opportunistic Network Environment) simulator for our simulation for providing a comparative analysis of performance of routing protocols. Full Text Title: Digital image correlation technique in measuring deformation and failure of composite and adhesive Author (s): Ab Ghani A. F. Digital image correlation technique is a non destructive testing (NDT) tool for measuring deformation and failure of Abstract: material have been used in this study over conventional methods such as strain gauges and extensometer. ASTM and other institutions have developed specific standards for composites. In the aim to inform the developed models of finite element/numerical and analytical, tensile tests were conducted on composite adherend and polymer adhesive specimens to obtain the stiffness and strengths of all constituents. Materials used for the testing campaigns are Glass Fiber Reinforced Polymer (GFRP) and Carbon Fiber Reinforced Polymer (CFRP) as well as adhesive materials for bulk testing Araldite 2015 and Sikalfex 292. The digital image correlation (DIC) technique is utilized for the characterisation of the constitutive and failure behavior of the constituent materials, with focus on the composite and polymer adhesive

material system.

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Title:
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The indicators and criteria of efficiency, water consumption and emission of thermal power plants

Author (s): S. Reza Shamshirgaran, Mohammad Mahdi Nouzari, M. Khalaji Assadi, Kian Najafzadeh and G. Reza Bavati

Abstract: Having the current constraints of serious water shortage which might cause more concern rather the depleting fuel resources and also the worrying global warming phenomenon, the power plants performance has to be evaluated based on not only energy efficiency but also water efficiency and environmental emission point of view. Therefore, power plants water consumption and emission production should be optimized simultaneous with the optimization of energetic performance. In other words, a high performance power plant would be considered as a high efficient, low water consumer and low emitting plant. In this paper the main indicators for the evaluation of energetic performance, water consumption and emission level of different pollutants are studied and then the global trend of these indicators for IRAN power plants investigated over a ten-year period, ending to 2012. The results show that the energetic performance of gas power plants seems to be higher than that of for steam and combined cycle power plants. Obtaining a 28 percent growth in overall energy efficiency of gas plants compared to the first year and achieving an average 85 percent peak load provision during ten years proved this fact. The water consumption criterion for wet-cooling steam plants decreased significantly to 0.6 m3/MWh at the end of tenth year. Finally, using the low quality fuel, whether oil or gas, has led to an 8.5 g/kWh SOx emission level from steam power plants. The most increase in CO2 emission is related to the steam power plants which has been equal to overall CO2 emission from the gas power plants, 850 g/kWh, at the end of ten-year period.

Full Text

Title: Dual axis tracking model for a heliostat field solar tower heat flux investigation

Author (s): Basil H. Ali, S. I. Gilani, Hussain H. Al-kayiem and Ayad Kadhim Khlief

The heat flux density and distribution are the main dominant design parameters for the solar tower plant output power Abstract: and receiver formation. Beside the plant geometries of the tower height, heliostat dimensions, field layout, and the optical properties, the quality of these two values depends on the heliostat field efficiency, which outlined in the mirror tilt angle cosine effect, reflected rays' spillage loss, heliostat distribution blocking and shadowing and tracking control error. To investigate the annual heat flux collecting quantity and distribution for an experimental field, distributed and located in Universiti Teknologi Petronas, a detailed dual axis tracking model is elaborated herein.

Full Text

Title: RAM analysis of crude oil transfer pumps using dominant failure mode

Author (s): Ainul Akmar Mokhtar, Muhammad Mokri Misren, Masdi Muhammad and Hilmi Hussin

Abstract A good maintenance strategy requires a good reliability, availability and maintainability (RAM) analysis in order to cater the real problem to specific equipment or a system. Resolving the real problem will improve the equipment/system reliability to ensure higher availability of the system to operate. In this paper, two crude oil transfer pumps were selected for RAM analysis. The analysis was done based on individual dominant failure mode that contributed to failures of the pumps. Firstly, reliability and maintainability analysis were carried out to obtain the required parameters. Then, reliability block diagram (RBD) was constructed and simulated to obtain the availability of the crude oil transfer pump system. This analysis can help to identify critical failure modes that affect the system reliability which directly affect the operational availability of the pump system.

Full Text

Title	Investigations into the effects of maximum deflection in low stiffness resilient shaft of Semi Active Steering System				
Author (s):	Roslina Ab, Rashid Joga D, Setjawan, Mujnuddin Maharun and Masri B, Baharom				
	Rosina AD. Rashiu, Juga D. Sellawan, Munudum Manarun and Mash B. Danarum				
Abstract:	The objective of this research was to examine the effects of low-stiffness-resilient-shaft (LSRS) maximum deflection angle on the response of a vehicle equipped with Semi Active Steering System (SAS) during the failure of Steer-by-wire (SBW). Modelling of LSRS stiffness that considers deflection angle was proposed and incorporated to the 3-DOF bicycle model of the vehicle dynamic. Simulations were performed on MATLAB/SIMULINK for several vehicle longitudinal speeds and the LSRS maximum deflection angles by applying a standard step steer input. Simulation results showed that vehicle responses were considered safe from roll over problem during the specified cornering maneuver since the lateral acceleration and yaw velocity values of the SAS system were always lower than the ones of the conventional systems. The turning radius was found to increase as the maximum deflection angle was used. The maximum deflection angle of LSRS to be as low as possible, between 100 to 30 o was suggested for keeping a consistent vehicle's drivability.				
	(Full Text)				
Title:	Numerical investigation on the effect of the inlets on the performance of oil/water separation in hydro cyclone				
Author (s):	Khor Y. Yin, Hussain H. Al-Kayiem and William P. K. Son				
Abstract:	Hydro cyclone are widely used in oil and gas industry particularly in this study similar to de-oiling process or improve purification of discharged water. As offshore oil production started to decline over time with high water cut in the production stream, this usually cause unprofitable production for huge expenditures in water handling. The periodically collapse in oil price further heightened the awareness on production technology to reduce unit costs. This paper offers a comprehensive suite of numerical simulation to predict the performance of oil-water hydro cyclone in an effort to reduce amount of water production at surface. Separation performance impact from single, dual and quad inlets configuration is simulated based on a tested turbulence and multiphase model. This investigation was carried out using Computational Fluid Dynamics in ANSYS-FLUENT 14 environment. The hydro cyclone swirling flow was simulated using RNG swirl dominated k-?? Turbulence model while the interface between crude oil and water was achieved using the Discrete Phase model. Based on the simulation results, it is concluded that hydro cyclone separation efficiency is affected by inlet velocities at tangential inlet and number of tangential inlets.				
	Full Text				
Title:	Development and validation of a twin shaft industrial gas turbine performance model				
Author (s):	Aklilu Tesfamichael Baheta, Mojahid Sidahmed, Shaharin Anuar Suleiman, Amare D. Fentaye, and Syed Afdhal Sayed Ghazali				
Abstract:	Gas turbine performance is very responsive to ambient and operational conditions. If the engine is not operating at its optimum conditions, there will be high energy consumption and environmental pollution. Hence, a precise simulation model of a gas turbine is needed for performance evaluation and fault detection and diagnostics. This paper presents a twin shaft industrial gas turbine modeling and validation. To develop the simulation model component maps are important, however they are property of the manufacturers and classified documents. In this case, known the compressor pressure ratio, speed, and flow rate, the missing design parameters, namely turbines inlet temperatures				

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INVESTIGATIONS INTO THE EFFECTS OF MAXIMUM DEFLEXTION IN LOW STIFFNESS RESILIENT SHAFT OF SEMI ACTIVE STEERING SYSTEMS

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ABSTRACT

The objective of this research was to examine the effects of low-stiffness-resilient-shaft (LSRS) maximum deflection angle on the response of a vehicle equipped with Semi Active Steering System (SAS) during the failure of Steerby-wire (SBW). Modelling of LSRS stiffness that considers deflection angle was proposed and incorporated to the 3-DOF bicycle model of the vehicle dynamic. Simulations were performed on MATLAB/SIMULINK for several vehicle longitudinal speeds and the LSRS maximum deflection angles by applying a standard step steer input. Simulation results showed that vehicle responses were considered safe from roll over problem during the specified cornering maneuver since the lateral acceleration and yaw velocity values of the SAS system were always lower than the ones of the conventional systems. The turning radius was found to increase as the maximum deflection angle increased. However, the turning radius became constant after a certain maximum deflection angle was used. The maximum deflection angle of LSRS to be as low as possible, between 10° to 30° was suggested for keeping a consistent vehicle's drivability.

Keywords: steer-by-wire, simulation, safety, stability, drivability, automotive.

INTRODUCTION

Steering system is another contributing factor that plays a role to the enhancement of passenger safety as well as vehicle stability. Steering system is the key interface between driver and the vehicle. Therefore, the reliable steering system is required during normal driving condition or negotiating the corner as well as avoiding the occurrence of accident.

Steer-by-wire (SBW) one of the latest creation in vehicle industry with a lots of benefits such as the weight of the vehicle are reduced and less injury during the frontend collision [1]. SBW system operates by replacing the rigid steering shaft with electronic controllers. However, system that fully relies on electronics circuit has critical challenge to maintain its functionality during the unexpected condition [2]. The main concern is to ensure the safety of the driver and passengers in the event of steering failure.

However, there are limited safety backup for SBW during the failure. Some other researcher proposed using a clutch, and servo motor as a backup [2, 3]. Concern to this problem, Semi-active-steering (SAS) system was introduced as a replacement to the SBW system during SBW system failure. SAS operates similarly as SBW with providing all the benefits together with backup system by replacing the clutch system with low-stiffness-resilient-shaft (LSRS) as a backup in the event of SBW failure. LSRS as shown in Figure-1 is attached permanently between the steering wheel and the pinion gear. It will operate as a conventional steering system in the event of SBW system failure. Several previous studies proved that LSRS is safe to be driven in the event of SBW failure [4, 5].

This paper examines the effect of maximum deflection of the LSRS to the response of the vehicle

during a standard cornering maneuver in which a constant steering angle of 90° is maintained. This study which has never been available in the literature, is important for ensuring the stability and handling performance of vehicle during the design stage of LSRS. The vehicle dynamic response to the applied steering angle input is analysed by utilizing the three degree-of-freedom (3-DOF) bicycle model as shown in Figure-2. The stiffness of LSRSS is modelled to be constant when the deflection is less than about 80 % of the maximum deflection. The stiffness parameter is modelled to follow a tangent hyperbolic function tin which its value increases continuously fast after this point. Simulations were performed to provide the vehicle position on a plane, lateral velocity, longitudinal velocity, lateral acceleration, and yaw velocity. The turning radius of the vehicle during this maneuver is estimated at various initial longitudinal speeds v_x and maximum deflection of LSRS Δ_0 .



Figure-1. Semi active steering system (SAS) including SBW and LSRS.

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EVALUATION OF CHIPS FORMATION OF AISI 316L SS USING PRECISION END-MILLING

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ABSTRACT

This paper discusses in detail precision end-milling approach in order to study the chips morphology of AISI 316L stainless steel which affects the machinability to a greater extent. The cutting speed ranges of 80 to 140 m/min while the feed rate ranges from 0.025 mm/tooth to 0.04 mm/tooth were investigated. Scanning electron microscope (SEM) was used for the 3D-view analysis in order to study the top surface, length of chip, width, thickness of chips and shear bands of the chips. Experimental results conclude that the chip length increases with an increase in cutting speed (V_c). Furthermore, the chip width decreases with an increase in feed rate (f). The chips become thicker as the cutting speed is increased. A relationship was built between the surface roughness and surface integrity with the chip morphology.

Keywords: precision end-milling, surface roughness, chip dimensions, AISI 316L stainless steel.

INTRODUCTION

Hard machining refers to the machining of materials whose hardness is above 45 HRC. The complexity related with hard machining especially with the end-milling process from a material deformation and chip formation is yet insufficiently documented. In early research studies the researchers have just focused on the formation of different types of chips such as continuous chip, wavy chips, discontinues chips or serrated chips [1]. AISI 316L stainless steel is in the category of difficult to cut materials with poor machinability. The machinability of a material affects the overall performance of the finished product. Moreover, the surface finish and tool life along with the work piece accuracy is greatly affected by the formation of chips. Slight changes in the chip formation have a damaging effect on the machinability of the workpiece during high speed machining (HSM). A material with good machinability requires less power consumption, less tool wear, high surface finish with no surface damage [2]. Elbestawi et al. [3] studied the formation of saw toothed chips that were resulted during machining of hardened steel. The chips were produced as a result of crack imitation at the fee surface which propagated towards the tool end. There are certain types of chips which are produced as a result of machining hardened materials [4]. Furthermore, Alkali et al. [5] investigated ASSAB DF-3 material with a cutter made up of wiper coated ceramic and found that the result of poor machinability were cutting speed and feed rate which produce saw toothed chips.

This research work focuses on the formation of various sized chips using variable machining parameters and their influence on the machinability of AISI 316L SS.

Table-1. The chips were collected after each run and collected for magnification and the remaining were The whole work is divided into introduction, experimental conditions, experimental setup, results and discussion which include morphology of chips and finally the conclusions of this research study.

EXPERIMENTAL CONDITIONS

Workpiece and cutting tool material

AISI 316L SS rectangular plate was used as the workpiece material. The weight percentage composition of AISI 316L SS consist of: 0.03C, 1.1Mn, 0.5Si, 16.5Cr, 10.02Ni, 2.01Mo, 0.02P, 0.013S and balance Fe (all in wt %). A tungsten carbide tool (WC) with 5mm diameter with four flutes was used for the cutting operation.

EXPERIMENTAL SETUP

The whole experimental procedure was taken place on MAZAK Variaxis 630-5x a 5-axis CNC milling machine whose spindle speed was 20-12000 rpm made by MAC Co. Ltd JAPAN. The workpiece was held tightly in fixture in order to minimize the vibration of the workpiece and the tool.

Different combinations of cutting parameters were used in order to study the chip morphology with respect to their dimensions such as length, width, thickness and shear band. For that dimensional study field emission electron microscopy (FESEM) was used. Four levels of cutting speed ranges from 80-140 m/min and feed rate ranges from 0.025-0.04 mm/tooth were used. A total number of sixteen experimental runs were selected to study the effect of cutting parameters on the chip morphology and properties as shown below in

blown in order to avoid mixing of different chips that were resulted using different cutting parameters. The corresponding chips morphology was studied using FESEM is described below.



PERFORMANCE ANALYSIS OF ROUTING PROTOCOLS FOR DELAY TOLERANT NETWORKS

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ABSTRACT

Delay Tolerant Networks (DTNs) enable communication in challenged environments where end to end connectivity may not exist at some intervals. DTNs use store, carry and forward paradigm for delivering the message from one node to other node. Routing in DTNs is considered a challenging task because of the frequent disconnections and short contact durations. In present paper we evaluate the performance of some popular routing protocols used in DTNs based on characteristics like delivery probability, delivery latency and overhead ratio. Evaluating the performance of routing protocol requires suitable simulation tool so that the parameters used in simulation may be varied widely and the evaluated performance gives the result closer to the real world scenario. We used ONE (Opportunistic Network Environment) simulator for our simulation for providing a comparative analysis of performance of routing protocols.

Keywords: delay tolerant networks, routing protocols, opportunistic network environment.

1. INTRODUCTION

phones Cellular and other personal communication devices can communicate globally with the help of infrastructure networks. Ad-hoc networks can be used to achieve local connectivity among the devices. Due to frequent change in topology and network disruption, classic TCP/IP based communication which requires end to end connectivity all the time fails where infrastructure is not available or is distroyed due to some natural disaster. In the scenarios similar to this, DTN concept is introduced, which works on the principle of store, carry and forward. In DTNs, a message received at a node is stored if no connectivity is found, necessary for forwarding the message. The message is forwarded to the next node when connectivity for other node towards the destination is available. In other words messages are forwarded from one node to other node when oppurunity occurs [1]

DTNs can be applied in many fields and many applications which can tolerate delays, may be deployed in challenged environments comparatively at very low cost. Application area of DTN includes telemedicine in remote areas, advertisement etc. It can be help in improving the possibility for doctors to give correct diagnose and prescribe treatment from remote location. Another application may be monitoring of wild life and communicating in the situation of natural disaster etc.

DTN operations can be assumed in three stages. In first stage nodes are required to discover their neighour as they are not aware about next opportunity to meet the neighour. In second stage the node stores the packet that it originates or receives from other nodes. In the third stagetha data is transferred other node. At this point they do not have any idea about the span of opportunity. Performance of such opportunistic networks is highly variable and depends on the movement of mobile nodes, density of node population and some other factors like the distance between source and destination node. Delivery of message may vary from a few minutes to hours or days, and it is possible that a large portion of data may not be delivered. Routing and forwarding algorithms play very important role in the performance of networks and it is very challenging task to design a routing strategy which performs well in the environment where regular internet routing algorithms do not work.

In section II we discuss the various routing algorithms used in DTNs. Section III describes the experimental setup and scenarios in which protocols will be evaluated. In section IV we discuss the performance analysis based on simulation results. Section V concludes the paper.

2. ROUTING IN DELAY TOLERANT NETWORKS

Many researchers have proposed routing algorithms for DTNs scenarios. Some of them use replication and no information is used, on the other hand some algorithms use no replication and forwarding is based on the available information. In some cases information with some replication is used to forward the message. In this section we discuss some of the popular routing algorithms available in literature.

In First Contact routing algorithm a node when comes in the contact with first N number of nodes forwards the messages to them. This approach is helpful in increasing the delivery probability but at the same time it also increases the bandwith and storage consumption [2]. Direct Delivery routing algorithm delivers the message when source node comes in the contact with destination node. In this strategy a source node has to wait until it comes in the proximity of destination node. However the probability that a source comes in the contact with destination may be very low even zero [3]. Epidemic routing forwards the message arbitrarily to any node without any knowledge about the network topology. Each node is required to maintain a buffer for the messages it originates and for the messages it receives from other nodes to forward. So each node sets a maximum buffer size for the distribution of buffers. Older messages needs



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EFFECT OF IRREVERSIBILITY ON COP OF DOUBLE EFFECT STEAM ABSORPTION CHILLERS

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ABSTRACT

Major irreversibilities in the absorption chillers are due to heat transfer between the absorption cycles and the environment. This effect also occurs for LiBr/H₂O steam absorption chillers. This study investigated the effect of external heat transfer processes on LiBr/H₂O steam absorption chillers installed at two district cooling plants in Malaysia. The study was done by evaluation of operating data. The heat transfer processes occurring at the desorbers, evaporators, condensers and absorbers for the absorption chillers at these two plants were investigated using reversible and zero order models. It is noted that the trends shown by the reversible and zero order models indicate the irreversibilities occurred for the absorption chillers at one of the plant indicate lower values. One possible cause of this occurrence was due to lower temperatures of returned chilled water. Hence in order to improve COP, the temperatures of returned chilled water should be increased.

Keywords: double effect steam absorption chiller, coefficient of performance, reversible model, zero order model.

INTRODUCTION

The simplest absorption chillier is single effect chiller. Single effect LiBr/H₂O absorption chillier uses Lithium Bromide as the absorber and water as refrigerant. The chillers use low pressure steam or hot water as heat source. The thermal efficiency of the chillers are low normally varies from 0.4 to 0.8 [1]. Due to this reason the single effect absorption chillers are not competitive compared to electric chillers. A more competitive chillers are double-effect absorption chillers which are of higher thermal absorption chiller efficiencies reaching COP of 1.2 [2]. The double effect chillers use higher temperatures steam as heat source to generate chilled water. The chillers are normally installed at cogeneration plants.

Studies on absorption chillers performances have been published by many authors. Gamri [3] investigated the potential of single effect, double effect and multiple effect absorption cycles for chilled water production. He reported that the COP of double effect absorption system is two times the COP of single effect system. He also noted that for each condenser and evaporator temperature, there is an optimum generator temperature. Lobus et al. [4] published a study on comparison of four empirically based models: GNA, $\Delta t'$, MPR and ANN, using experimental data of small capacity absorption chillers. The authors concluded that all the four modelling methods are suitable for complex simulation environment. The statistical indicators and tests indicate ANN method had slight advantage compared to other two methods. Park et al. [5] analysed the performance of LiBr/H₂O absorption chiller during partial load operation. The study was on the effect of cooling water flow rate and cooling water inlet temperature on the absorption chiller performance and energy saving during partial load operation. The authors noted that the performance of the absorption chiller is more sensitive to the changes of inlet water temperature rather than the cooling water flow rate.

Published literatures highlighted various methods used to evaluate COPs of absorption chillers. Among the methods adopted are using experimental data and simulation approach. To complement the studies, the proposed study is based on operating data of actual chillers. The main objective of this study is to use actual data to evaluate COP of LiBr/H₂O operating at gas district cooling (GDC) plants. Reversible and zero order models are used. This is to validate theoretical aspects of the models. In addition, the findings of the study could assist the plant owners and operators for monitoring of plant performance.

DOUBLE EFFECT LiBr/H2O SAC

A schematic of double effect LiBr/H₂O steam absorption chiller (SAC) is shown in Figure-1 [6].



Figure-1. Schematic of double effect LiBr/H₂O SAC [6].