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Judul Jurnal Ilmiah (Artikel) : Multi-gait Strategies for a Quadrupedal Starfish Soft Robot Incorporating Motor-Tendon Actuator  
 Jumlah Penulis : 4 orang (Munadi, Mochammad Ariyanto, Yoga D. Setiawan, Tomohide Naniwa)  
 Status Pengusul : penulis ke-1  
 Identitas Jurnal Ilmiah : a. Nama Jurnal : Journal of Engineering Science and Technology (JESTEC)  
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 g. Terindex : Scopus, Q2

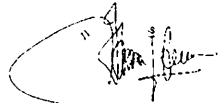
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Semarang, 5 Agustus 2020

Reviewer 2



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Reviewer 1



Prof. Dr. rer. nat. Ir. A.P. Bayuseno, M.Sc.  
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**2. Ruang lingkup dan kedalaman pembahasan:**

Artikel berisi tentang rancang-bangun quadrupedal starfish soft robot yang menggunakan metode motor-tendon sebagai aktuator. Artikel disampaikan dari tahap desain, analisis, assembly, sampai dengan pengujian robot di medan yang beragam. Pembahasan artikel cukup dalam dimana dari segi material yang digunakan sampai persamaan deret fourier digunakan dalam mendefinisikan sistem gerak (gait) robot.

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- Ruang lingkup dan kedalaman pembahasan:**  
 Ruang lingkup dan pembahasan artikel tentang quadrupedal starfish soft robot cukup detail, dari proses desain, memilih material, analisis, simulasi, sampai dengan pengujian robot, yang disampaikan dengan runut. Pembahasan cukup mendalam diantaranya dibantu dengan penggunaan beberapa software seperti SolidWorks untuk desain dan Matlab/Simulink untuk simulasi sistem kontrol dan gerak robot.
- Kecukupan dan kemutakhiran data/informasi dan metodologi:**  
 Artikel ini memiliki novelty yang baik dimana menyampaikan teknologi robot menggunakan bahan soft dari resin dan katalis (tidak rigid). Artikel soft robot ini menyampaikan dengan baik metode yang digunakan saat mulai desain, analisis, sampai dengan pengujian. Sekitar 90 % pustaka yang digunakan terbitan dalam 10 tahun terakhir. Turnitin similarity index sebesar 10 %.
- Kelengkapan unsur dan kualitas terbitan:**  
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Semarang, 5 Agustus 2020

Reviewer 2

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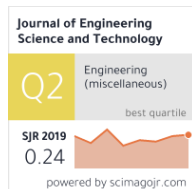
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## **MULTI-GAIT STRATEGIES FOR A QUADRUPEDAL STARFISH SOFT ROBOT INCORPORATING MOTOR-TENDON ACTUATOR**

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### **Abstract**

The majority of untethered robots are developed using rigid material. The use of rigid material has several limitations, one of which is the stability of the robot when moving/walking in difficult terrain. This is a challenge in developing robots that can adapt to unpredictable areas or complex work environments. One solution offered is the development of soft robots. Soft robots have the advantage of flexibility across complex environments. However, most untethered legged soft robots are driven by pneumatic actuators that have slower and less precise responses, and soft robot surfaces are prone to tearing and breaking. In this study, the development of soft robots using motor-tendon actuators was carried out. Multi gait pattern strategies are developed for controlling the walking gait of the robot. Undulating and crawling gaits are selected as the main gaits of the robot. The gaits are generated using the sixth order Fourier series. After the gait strategy is developed and embedded in the robot, various tests are performed to test the robot's walking movements such as forward, backward, and turning on smooth and rough surfaces. The tests are performed to determine the ability of the robot to pass through small and impassable obstacles. The total robot weight is 545 grams and can carry loads up to 400 grams. Based on testing the motion strategy that has been developed using the Fourier series, the robot is able to walk on flat terrain with smooth or rough surfaces, the robot also manages to pass obstacles such as small and impassable obstacles. The range of wireless cameras that can be achieved is 60 meters, while the range for wireless robot control is 46 meters.

Keywords: Gait strategy, Motor-tendon actuation, Multi-gait pattern, Soft robot.

## SEGMENTATION OF OVERLAPPING CHARACTERS IN LANNA USING MIXED ALGORITHM

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### Abstract

Lanna language is a popular language in the northern part of Thailand. The segmentation of printed Lanna characters is a challenging problem. Normally, the segmentation method of characters begins with using horizontal and vertical histograms into line segmentation and character segmentation. Then, when written the output will be the correct clear characters, overlapping characters and touching characters. Frequently, there are some problems with the overlapping characters and the touching characters. This paper focuses on only the overlapping characters, overlapping between alphabets and vowels. The methods will segment the overlapping characters by histogram techniques, beginning with splitting, rotating and merging the characters. The experiments used the printed Lanna characters in many books as a data set. The results achieved an accuracy rate of 96.72%.

Keywords: Character segmentation, Merge character, Overlapping character, Rotate character, Split character.

## **BROADBAND NETWORK FAULT PREDICTION USING COMPLEX EVENT PROCESSING AND PREDICTIVE ANALYTICS TECHNIQUES**

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### **Abstract**

The customer satisfaction of the broadband network mostly depends on robustness of the service offered by Internet Service Providers (ISP). Providing uninterrupted network service is essential in this communication era even though interruption in internet connection is unavoidable. However, if it is predicted earlier, the consequences can be minimized. Hence, it is essential to accurately forecast the faults in internet connection for Telecom Companies. The proposed tool for predicting broadband network fault is made up of a combination of Complex Event Processing (CEP) and Predictive Analytics (PA) techniques. The PA is used to predict network faults using techniques such as Logistic Regression (LR) or Naïve Bayes (NB). CEP is used to perform the prediction in real-time on streaming events. In this paper the performance of predictive model configured with LR is compared with the one configured with NB. Both the models had been tested for its performance using appropriate data set received from telecommunication industry using precision-recall curve and accuracy. It was found that the prediction accuracy of LR model (89.65%) is better than that of NB model (86.25%). It was also noticed that the derived AUC of LR is 0.52 which is much higher than 0.21 of NB. Hence, it was concluded that the predictive model configured with LR is performing better than the one configured with NB. So, the proposed tool configured with LR model can be implemented for fault prediction in network management systems.

Keywords: Complex event processing, Logistic regression, Machine learning, Naïve Bayes, Predictive analytics.

**INTEGRATED USE OF POLLUTION INDICES AND GEOMATICS  
TO ASSESS SOIL CONTAMINATION AND IDENTIFY SOIL  
POLLUTION SOURCE IN MINIA GOVERNATORE, UPPER EGYPT.**

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**Abstract**

This paper assesses the concentrations of Heavy Metals (HMs) to evaluate their potential risk to soil pollution in a cultivation area in the Nile Valley (Minia Governorate) with decades of intensive farming. 159 soil profiles samples were analyzed for essential trace constituents (B, Fe, Cu, Zn and Mn) and toxic heavy elements (As, Cd, Cr, Co, Ni, Pb, and Se). The metal pollution index MPI was applied to assess the mobile forms and total content of HMs in all profiles' layers. Geostatistical models were applied to identify the sources and hotspots of accumulated HMs in the studied soil. The results revealed that the contamination by accumulated HMs is due to anthropogenic activities from industry and sewage irrigation, which indicated that the high content of HMs in the soil is not from geogenic sources. HMs concentrations are higher in the southern part of the area compared to the middle portion, while the northern part's soil had the lowest concentrations. Uncontrolled surface or flash irrigation is a likely cause of leaching of HMs to sublayers of soil. The compline GIS map of MPI indicated that highly effected portions are affected by El Moheet drainage water from Abu Qurqas sugar factory. This work raises the needs to develop strategy and policies to prevent widespread HMs soil contamination in the area. This study confirms the need to install filters and water purification systems on the openings of sugar factories in Minia and consequently all the factories on the Nile River and all canals used for irrigation.

Keywords: Egypt, Heavy metals, HMs pollution sources, Minia governorate, Statistical analysis.