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

Judul (Artikel)	:	Predictive Control Approach for Restricted Areas Avoidance of Autonomous System Penulis : Sutrisno, Widowati, **Sunarsih** and Kartono			
Jumlah Penulis	:	4 orang			
Status Pengusul	:	~~Penulis pertama~~/penulis ketiga/~~penulis korespondensi~~			
Identitas Jurnal Ilmiah	:	a.	Nama Prosiding	:	International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE
		b.	Nomor ISSN/ISBN	:	-
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Kategori Publikasi Prosiding : ☑ Procedia/Prosiding Internasional Terindeks
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Hasil Penilaian *Peer Review* :

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Total = (100%)	23,74	22,51	23,13
Nilai Pengusul =40%x1/3	3,16	3	3,08

Semarang, 19-9-2019

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	Procedia ☑	Prosiding Internasional ☐	Prosiding Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	2,5			2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,5			7,08
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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	7,5			7,08
Total = (100%)	25,00			23,74
Nilai Pengusul =40%x1/3x23,74 =3,16				

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Semarang, 30-9-2019

Reviewer 1

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LEMBAR
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Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Procedia ☑	Prosiding Internasional ☐	Prosiding Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	2,50			2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,5			6,67
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	7,5			6,67
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	7,5			6,67
Total = (100%)	25,00			22,51
Nilai Pengusul =40%x1/3x22,51=3				

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a. Kelengkapan unsur isi prosiding sesuai dengan template meliputi introduction hingga conclusion.
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c. Data yang ditulis dengan model dan formula erta simulasi hybrid dinamik. Referensi yang digunakan ada 16 referensi terkink 10 citasi.
d. Kualitas penerbit cukup baik. Simirity 16%.

Semarang, 17/9-2019

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13 December 2018, Article number 8576946, Pages 203-207
5th International Conference on Information Technology, Computer and Electrical Engineering, ICITACEE 2018; Semarang; Indonesia; 26 September 2018 through 28 September 2018; Category numberCFP1889Z-PRT; Code 143726

Predictive Control Approach for Restricted Areas Avoidance of Autonomous System (Conference Paper)

Sutrisno ✉, Widowati ✉, Sunarsih ✉, Kartono ✉

Department of Mathematics, Diponegoro University, Semarang, Indonesia

Abstract

View references (16)

In this paper, we have formulated and simulated a hybrid dynamics in a piecewise affine (PWA) model of an autonomous system for several restricted areas avoiding purposes. The scenario of the restricted area avoidance is formulated by labeling the normal (unrestricted) area and the restricted area as mode 0 and mode 1 respectively. The dynamics of the autonomous system is formulated as a PWA model governed by these two modes. We simulate dynamics of the given autonomous system as follows. The given autonomous system is initially located at some point/position and it have to reach some given final/target point/position with optimal condition by minimizing the trajectory and effort. To determine the optimal trajectory, we applied the model predictive control method to generate the optimal input so that the autonomous system avoids some given restricted areas. From the simulation results, the given autonomous system reached the target position and avoids the given restricted areas with optimal trajectory generated by the predictive controller. © 2018 IEEE.

SciVal Topic Prominence

Topic: Collision avoidance | Motion planning | Avoidance algorithm

Prominence percentile: 91.849

Author keywords

Autonomous system | hybrid dynamical system | several restricted areas avoidance.

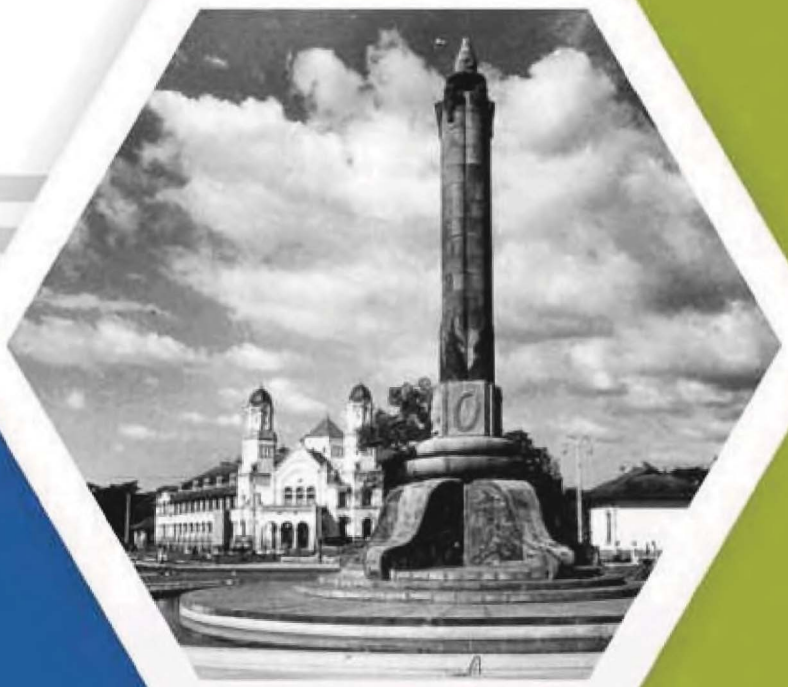
Indexed keywords

Engineering controlled terms: Dynamical systems | Dynamics | Trajectories

Engineering uncontrolled terms: Autonomous systems | Hybrid dynamical systems | Optimal conditions | Optimal trajectories | Piecewise affines | Predictive control | Predictive controller | several restricted areas avoidance

Engineering main heading: Model predictive control

ICITACEE 2018



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GREEN TECHNOLOGY AND SMART ENVIRONMENT FOR A CONNECTED WORLD

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Foreword From Dean of Faculty of Engineering Diponegoro University, Semarang-Indonesia

It is our great pleasure to join and to welcome all participants of the 5th International Conference on Information Technology, Computer, and Electrical Engineering 2018 (ICITACEE 2018) in Semarang – Indonesia.

The aims of the conference are to obtain and to extend the knowledge of the recent issues, opinions, bright ideas about the development of a comprehensive green technology. ICITACEE 2018 invites the scholars and encourages the researchers to submit high quality manuscripts and share their findings and experiences in this conference. May through this event there will be enlightens and mutual collaborative networks to various topics such as power systems, telecommunication, vehicular technologies, controls, information and computer technologies and as well as other field that corresponds, such as green application and interdisciplinary topics for improving the quality and benefits of the research.

It is a great pleasure to welcome all the participants of this conference in Semarang. I also would like to welcome several members from Universiti Teknologi Malaysia, Universiti Teknikal Malaysia, Universiti Kebangsaan Malaysia, American University of Middle East, Queen Mary University of London, National Taiwan University of Science and Technology, Diponegoro University, Bandung Institute of Technology, Gadjah Mada University, and so on.

I do hope that this conference to be a valuable forum to encourage and embrace cooperative and interdisciplinary research among the engineers and scientists for bringing better life.

My heartful gratitude is dedicated to Organizing Committee members and the staff of Department of Electrical Engineering and Department of Computer Engineering of Faculty of Engineering, Diponegoro University for their generous effort and contribution toward the success of The 5th ICITACEE 2018

I hope that the conference will be stimulating and memorable for you. So, enjoy your time in Semarang

Ir. M. Agung Wibowo, MM, MSc, PhD
Dean of Faculty of Engineering
Diponegoro University, Semarang-Indonesia

Program

Thursday, September 27

Thursday, September 27 9:30 - 11:30

INV: Invited Paper

Green Computing: Opportunity of Using Breadth Fixed Gossip Algorithm for Optimizing Power Supply Route in Power Plant
Mauridhi Purnomo (Institut Teknologi Sepuluh Nopember, Indonesia)
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Thursday, September 27 13:00 - 15:15

A1: Electronic Circuit & Control

Magnetic Field Relationship between Distance and Induced Voltage Generated by EMP
Betantya Nugroho and Azli Yahya (Universiti Teknologi Malaysia, Malaysia); Abd Rahim (Mindmatics, Malaysia); Trias Andromeda (Universitas Diponegoro, Indonesia)
pp. 7-10

Communication Protocol on 64-Channel ECVT Data Acquisition System
Arbai Yusuf (Universitas Indonesia & C-Tech Labs Edwar Technology, Indonesia)
pp. 11-14

Cooling System Design Based on Thermoelectric Using Fan Motor on-off Control
Munnik Haryanti (Universitas Dirgantara Marsekal Suryadarma, Indonesia)
pp. 15-18

Design of The 3D Surface Scanning System for Human Wrist Contour Using Laser Line Imaging
Riky Tri Yunardi and Ario Imandiri (Universitas Airlangga, Indonesia)
pp. 19-23

Temperature Controlling Using PID Controller on Rice Grain Fluidized Dryer Prototype
Aris Triwiyatno (Diponegoro University, Indonesia)
pp. 24-27

PID Based Air Heater Controller Implemented With Matlab/Simulink and Arduino Uno
Bambang Supriyo, Dadi Dadi, Sulistyo Warjono, Adi Wisaksono, Sri Astuti and Kusno Utomo (Politeknik Negeri Semarang, Indonesia)
pp. 28-32

Design A Low Cost Wind Direction Sensor With High Accuracy
Yoga Utama (University of Widya Kartika, Indonesia)
pp. 33-38

Quadruped Robot with Stabilization Algorithm on Uneven Floor using 6 DOF IMU based Inverse Kinematic
Rofiq Prayogo (Diponegoro University, Indonesia)
pp. 39-44

Design and Characterization of Low-Cost Soft Pneumatic Bending Actuator for Hand Rehabilitation
Mochammad Ariyanto, Joga Setiawan, Rifky Ismail, Ismoyo Haryanto, Tania Febrina and Doni Saksono (Diponegoro University, Indonesia)
pp. 45-50

pp. 171-175

A GIS-based Waste Water Monitoring System Using LoRa Technology
Yudi Windarto and Agung Prasetijo (Diponegoro University, Indonesia); Galang Damara (Universitas Diponegoro, Indonesia)
pp. 176-179

Filtering for Data Aquisition on Wireless Sensor Network
Aghus Sofwan, Sumardi Sumardi and Nely Ulwiyati (Diponegoro University, Indonesia)
pp. 180-184

Thursday, September 27 15:30 - 18:45

A2: Electronic Circuit & Control

Predictive Control for Relative Performance Management
Dharma Aryani (State Polytechnic of Ujung Pandang, Indonesia); Nur Asyik Hidayatullah (State Polytechnic of Madiun, Indonesia)
pp. 185-190

Design and Development of Injection Current Control On Inverter-Based Proportional Resonant Method
Abdul Haris Kuspranoto and Iwan Setiawan (Universitas Diponegoro, Indonesia); Mochammad Facta (Diponegoro University, Indonesia)
pp. 191-196

Development of Object Tracking System Using Remotely Operated Vehicle Based on Visual sensor
Erwin Saputra and Ronny Mardiyanto (Institut Teknologi Sepuluh Nopember, Indonesia)
pp. 197-202

Predictive Control Approach for Restricted Areas Avoidance of Autonomous System
Sutrisno Sutrisno, Widowati Widowati, Sunarsih Sunarsih and Kartono Kartono (Diponegoro University, Indonesia)
pp. 203-207

Kufarm: A Modified Platform of Automation Planting System
Damar Pramuditya (Telkomuniversity, Indonesia); Agung Nugroho Jati and Fairuz Azmi (Telkom University, Indonesia)
pp. 208-213

Tracking Object based on GPS and IMU Sensor
Wahyudi Wahyudi (Department of Electrical Engineering, Diponegoro University)
pp. 214-218

Development of Navigation Method of Buoyant Boat for Maintaining Position of The Boat and ROV
Ronny Mardiyanto, Heri Suryoatmojo and Badrut Tamam (Institut Teknologi Sepuluh Nopember, Indonesia)
pp. 219-224

Development of a Low-Cost Quadrupedal Starfish Soft Robot
Mochammad Ariyanto, Munadi M and Joga Setiawan (Diponegoro University, Indonesia)
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Performance Improvement of Robot Warehouse Based on Battery Operational Conditions
Almira Budiyanto, Aris Setiawan and Setyawan Wahyu Pratomo (Universitas Islam Indonesia, Indonesia)
pp. 230-233

B2: Electric & Power System

Design of Adaptive PID Controller for Fuel Utilization In Solid Oxide Fuel Cell
Darjat Darjat, Sulistyo Sulistyo and Aris Triwiyatno (Diponegoro University, Indonesia)
pp. 234-239

Design of The 3D Surface Scanning System for Human Wrist Contour Using Laser Line Imaging

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***Abstract*— The 3D surface scanning system has been applied in the 3D printing manufacturing technique to create a three-dimensional object. In the development of 3D scanning system have focused in rehabilitation field for prototype realization purposes of wrist orthopedic cast design such as brace wristband. This paper presents the design of a low cost 3D scanner to scan the surface contour of the object. 3D scanner is designed with a line laser and cameras to scan the skin surface of the human wrist. The laser line is used to form the laser line projected image on the surface of the object that contains the intersection curve. The camera is used to detect the shape of the projected 2D curve and sending data from the surface of the object to a computer that will be converted into a 3D reference point. The conversion result represents a reference point associated with the segment line curves. In the experiment, the reference point used for 3D reconstruction of the surface of the object using Octave 4.2.1. The performance of the system is tested and compared using explicit calibration. The result shows the scanning system can be implemented to scan and reconstruct the object surface contours.**

Keywords*— *3D surface scanner; laser line imaging; 3D reconstruction; human wrist contour

I. INTRODUCTION

Three-dimensional (3D) technology are widely used in various fields such as biomedical and biomechanical engineering. In a rehabilitation applications, the 3D scanner is focused on the use of 3D printing for the purpose of orthopedic casting prototype realization is increasingly widespread such as brace wristband. Obtaining a 3D model for 3D printing have interest to accommodate the geometry of the anatomy of human body part. The ability of a computer to obtain geometric information to create a digital 3D model of an object is relatively complex. In other projects, the scanner used some digital cameras for scanning the object and human body part [1-2]. One of the most important information is the line or curve to create a digital 3D model of the surface or object. To obtain a 3D model, the scanner system should extract information about the surface by performing a 3D reconstruction. To design a 3D surface scanner of the human wrist, it is important to develop better methods for detecting surface to obtain of anatomical geometry shown in Fig. 1.

In general, the imaging laser line consists of a camera and a line laser pointer to detect the surface conditions. Line detection is used to find and extract the line segments projected on the surface of the image using the camera. Using the threshold method as performed by Yunardi [3], the laser line and the background image can be separated. From the threshold process acquired of the image that contains the representation of the lines and represented as curves. Papari and Wang [4-5], to the process of extracting the curve shape 2D line detection with the edge detection, has obtained well performed. The line detection is represented by a curve with a series of discrete points. The discrete points in 3D from the obtained will be converted into 3D points, which are used to reconstruct the desired object and get 3D reconstruction from the surface.

This research focuses on designing a simple interface from a 3D scanner system that implements computer vision in a 3D surface scan of the anatomy of the human wrist. A laser line imaging method that developed using a laser line and the camera. The laser line applied to create of a drawing of the line on the object and sample surface. The camera used to capture an image from the selected projected line on the surface of the object. The results and analysis section we tried to evaluate the proposed laser scanning method followed by comparison based on the laser line on the surface and the line image captured by a camera. Then conclusion section discussed.

II. PROPOSED WORK

Many various designs and techniques of the scanner used to create a model of three-dimensional objects. In 3D data acquisition, stereo vision and Microsoft Kinect as an electronic device equipped with RGB-D cameras have been used under the computer unit [6]. Winkelbach [7] used line laser scanning markers based on structures known as reference planes for scanning small object surface. In another alternative to scanning based on distance developed by Eitel [8]. 3D objects can be created in some form of 3D model geometry from the sensor data source results. Munir [9] has designed a mapping contour of object surface based on the ultrasonic sensor. The laser triangulation and structured light are the most widely used processes for extrapolating the shape of object techniques in 3D reconstruction [10].

By using the 3D laser scanning and imaging technology, the design of a 3D printed orthopedic cast is easier. Some practices in occupational therapy for making of assistive devices by 3D scanning methods have a lot of advantages such as fit and aesthetic features [11]. Fitzpatrick [12] devised a method of fabricating three-dimensional plastic models of a 3D printed arm cast. However, the research only aimed to evaluate the proposed simple 3D scanning method based on the laser line on the surface of the object using the combination of camera and laser pointer.

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Development of Radio Direction Finder using 6 Log Periodic Dipole Array Antennas

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***Abstract*—Radio Direction Finder (RDF) system can be used in search and rescue operations. However the existing RDF system is complex, expensive and not suitable for mobile operation such as search and rescue operations. This paper presents the development of a unique low cost Radio Direction Finder (RDF) using 6 Log Periodic Dipole Array (LPDA) antenna. Six unit of log periodic printed circuit board antenna from WA5VJB is used in this project since it is commonly used in UHF licence-free band. A modified amplitude comparison method has been made in order to match the antenna character. The unique physical design, electronics design and software design implemented in the RDF system are described in this paper. Also a test has been conducted and the system performance shows the RSM error of 14°.**

Keywords—radio direction finder (RDF), direction finder (DF), amplitude comparison, log periodic dipole array (LPDA), directional antenna, search and rescue.

I. INTRODUCTION

Radio Direction Finder (RDF) is a system used to find direction of an emitted signal. This system usually used to locate source of interference, locate non-authorized transmission or locate any known transmission in search and rescue operations [1] [2] [3]. A single RDF system only capable to determines direction of arrival (DOA) of the signal. By using several RDF system and geolocation analysis the transmitter can be localized and then drastically shrink the searching area and eventually reduce the searching time.

There are several methods can be used to localize the emission source that categorized as time based, phase based and amplitude based [1]. The time based radio location finder usually called as Time Difference of Arrival (TDOA). TDOA works by measuring the difference of signal arrival in several receiver locations that separated several kilometres away. These time different then calculated using trilateration to get location of emission source related to the TDOA receiver. Since TDOA need to calculate the time, it requires a high precision synchronised time reference connected to all receivers. The most growing method is phase analysis based [4]. This method works by measuring phase differences between several receivers that usually separated less than wavelength of the detected signal. Phase based method require single phase reference to measure the phase differences accurately [5]. While amplitude based works by comparing amplitude of several receiver related to the receiver configurations. The requirement of the amplitude method is the calibrated radio to get proper amplitude/power measurement.

Nowadays the amplitude comparison RDF is nominated as the simplest method in RDF [6] [7]. However the unique of antenna requirement for this methods increase the design complexity of this method. By using a common type of antenna, the complexity of the system can be reduced drastically. However, since the antenna is not designed for amplitude comparison RDF purpose, the performance is compromised and modification is required. The modification is to utilise Watson-Watt formulation in DOA calculations by considering the combinations of antenna structure and the signal amplitude (using vector analogy).

This paper explains the modification process in implemented method and the investigate performances of the system.

The paper organized as follows. In section 2, the system design that covers physical design, electronics design and software design is presented. In section 3, the performance of the developed system is evaluated. In section 4, the paper is concluded.

II. SYSTEM DESIGN

In this paper common directional antenna, RTL-SDR and GNU Radio Companion (GRC) are used in this amplitude comparison RDF development. Six units of 400-1000 MHz log periodic printed circuit board antenna from WA5VJB are used according to its market availability and its good documentations. The 400-1000 MHz log periodic printed circuit board is basically log periodic dipole array (LPDA) antenna that implemented on the printed circuit board. This antenna has LPDA characteristic such as directional beam and wide band (400-1000MHz) which is suitable for amplitude comparison RDF.

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The Spreading of Misinformation online: 3D Simulation

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***Abstract*— Social media is becoming the de-facto platform for the dissemination of information as research suggests more Internet users are using social media as their main source of news. In this model, the spread of unverified information is becoming a common place where some could share misinformation as fact. News sharing on social media lacks the traditional verification methods used by professional media. In previous publications, the authors presented a model that shows the extent of the problem thus suggesting the design of a tool that could assist users to authenticate information using a conceptual approached called 'right-click authenticate' button. A two-dimensional simulation provided bases for a proof-of-concept and identification of key variables. This paper uses Biolayout three-dimensional modelling to expand their simulations of different scenarios. Using the given variables and values, this paper presents a better understanding of how misinformation travels in the spatial space of social media. The findings further confirmed that the approach of 'right-click authenticate' button would dramatically cut back the spread of misinformation online.**

Keywords— Misinformation; Social Media; Cascades; three-dimensional simulation; Biolayout.

I. Introduction

Social media nowadays is attracting millions of users to its various platforms, enabling them to spread information and share their interests across the web easily. Due to the huge amount of unverified information presented as facts, most of what is seen online cannot and could not be trusted. Malicious users who have motives to sway other users' opinions and beliefs tend to be the source of spreading misinformation. Misinformation could be in the form of chain emails, spam, fake news, dotted images, out of context images, out of context videos, misleading news and many more. The spread of this misinformation does not only waste users' time and efforts, but could also be dangerous. Therefore, there have been attempts to find means or tools that would limit the spread of misinformation on social media, hence improving the users' experience in general and bring some credibility to verifying content shared online [1][2]. The approach consists of developing a technique that limits the spread of fake news by allowing users to authenticate it from within their web browsers. If this piece of information was deemed to be unauthentic, then the user will likely stop sharing it with others out of social responsibility, and hence will drastically limit its spread.

II. Literature Review

Online social networks are becoming one of the key sources of information and news especially among younger generations, according to the results of the Oxford Internet Survey [3]. Online applications and social media tools such as Facebook, Twitter, etc. are considered as one of the leading methods of distributing news and user-generated content, which facilitate the creation and exchange of the most up-to-date information. However, sharing inaccurate pieces of information, referred to as misinformation in [4] is widespread in this medium. Misinformation is also defined as "piece of malicious information intentionally made to cause undesirable effects in the general public, such as panic and misunderstanding; or to supplant valuable information" [5]. Moreover, arrangements such as rumours, false messages, and illegal propaganda can be considered a variety of misleading information that the term 'misinformation' is referring to [6]. Having misinformation shared on social media on a daily basis breaches the reliability of those tools and can create misunderstanding among societies on particular cases. Also, the aggregation of people around common interests, worldviews, and narratives is simplified with the wide availability of user-provided content in social media. As stated in [7], misinformation propagation occurs when malicious individuals utilise Social media tools to distribute misinformation.

In [8] researchers report that the increase in social media users has resulted in the increase in misinformation distribution. Social media has become a major tool for the propagation of misinformation since proper filtering techniques similar to reviewing and editing information in traditional publishing is not in place to fulfil the lack in social media users' accountability [9]. Moreover, the majority of social media users may not be attentive to the untruth story as a consequence of sharing huge volumes and diverse forms of information, misinformation, and propaganda in social media.

In [10] Libicki explains that prior beliefs and opinions of people influence their decision in accepting misleading information.

Moreover, in [11] Kumar and Geethakumari discuss that people believe things which support their past judgments without questioning them. False information spreads just like accurate information. However, the role of information context is central. This links with the survey findings by [3] that shows topics on technology, finance, politics and health are the ones

Performance Improvement of Human Activity Recognition based on Ensemble Empirical Mode Decomposition (EEMD)

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Abstract*— Cell phone and advanced hardware, for example, fitness trackers, heart observing, and wearable gadgets are more regularly used nowadays to capture human exercises. Inertial Measurement Unit (IMU) sensor can read some parameter from human activity. Indicator and position formed from that sensor can be translated back by machine learning to classify human activities. Classification of human exercises known by the term Human Activity Recognition (HAR). Cell phone IMU sensor's data is not linear and stationary. Feature from non-linear signal can be extracted better by using non-linear and non-stationary signal decomposition algorithm than by using conventional frequency analysis (Fourier Transform or Wavelet Transform). Ensemble Empirical Mode Decomposition (EEMD) method is better than Empirical Mode Decomposition (EMD) because EEMD utilize non-linear signal decomposition based on either time-domain or frequency-domain. For further analysis, multi parameter added from EEMD signal processed with Hilbert-Huang Transform (HHT) to get instantaneous energy density. Instantaneous energy density is representing the absolute amplitude of signal over time and also marginal spectrum. Marginal spectrum shows the amplitude signal in frequency domain. Instantaneous energy density and amplitude of signal becomes selected properties for classification process. The novel approach of this research is joining EEMD process as a raw signal modifier and HHT as feature extraction process. Naïve Bayes, Support Vector Machine (SVM), and random forest used as machine learning classifier. The highest accuracy obtained from the Random Forest classifier and overall accuracy of three classifiers is 95% for all four performance indexes: recall, precision, F-measure, and accuracy.

Keywords—activity recognition, ensemble empirical mode decomposition (EEMD), feature extraction, IMU sensor

I. INTRODUCTION

Data about human action acknowledgment and postural progress (HAPT) is extremely valuable for human life in the distinctive sort of applications and services [1]. This point drove the advancement of an algorithm or even in system architecture by a researcher. Pervasive and mobile computing, surveillance-based security, context-aware computing, and ambient assistive living are the example of human activity application [2]. Human activity data is acquired through some different methods [3]. Two major methods and most developed nowadays are wearable device sensor [4] and machine-vision [5]. Each method has some advantages and disadvantages [6]. One disadvantage of machine vision is a limitation of the sensor viewpoint, so human movement cannot flexibly be monitored. The wearable device is chosen because cheaper and has a high sample rate which is also combining depth information.

The smartphone is a multifunction device because have sensors that can record human activity easily. IMU sensor is one kind of smartphone sensor to detect any human motion. This research conducted to use Smartphone to gain human activity recognition by using spatial data. The main purpose of human activity recognition is to minimize error that occurred in the activity classification process. Some methods are proposed by some researchers in order to gain state-of-the-art in human activity recognition using a smartphone.

In the recent decade, machine learning is used to classifying something by doing prediction. However, it is not an easy task to "teach" the machine about how they should respond to the input. The key point of the machine learning method is a feature extraction process. Features are something need to be unique, differs one with others, and represent some criteria in given information [7]. It becomes rule-of-thumb, that more informative the features, the more accurate the prediction results. Since classifier has different characteristic it is needed to be selective to choose the most suitable classifier from the extracted feature.

IMU sensors signal are not-stationary and non-linear, so instead of using conventional feature extraction such as statistical computation (mean value, median value, a variance value, and etc.) and frequency analysis (Fourier Transform and Wavelet Transform), feature extraction based on ensemble empirical mode decomposition (EEMD) more preferable. This signal analysis method has been used in the different field of applications, especially in the application has to deal with high intermittency signal. EEMD proposed by Huang in 1990s [8]. The basic concept of EEMD is a decomposing signal in time-scale characteristic. After the EEMD process, usually, some of the researches doing some Fast Fourier Transform such as Hilbert-Huang Transform (HHT). HHT is used in order to get a better signal description, in both frequency-domain and time-domain. As a trade-off, EEMD is needed more computational effort and time consuming [9]. For model generation stage, classifiers that conducted in this research are Support Vector Machine (SVM), Naïve Bayes, and Random Forest.

Human activity recognition with sensitive transitional activity is already provided on the public dataset. EEMD

CERTIFICATE

This is to certify that

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