

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

Judul Karya Ilmiah : Particle Swarm Optimization (PSO)-Based Self Tuning Proportional, Integral, Derivative (PID) for Bearing Navigation Control System on Quadcopter

Jumlah Penulis : 3 Orang

Status Pengusul : Penulis Pertama

Identitas Prosiding :

- a. Judul Prosiding : The 2017 4th International Conference on Information Technology, Computer, and Electrical Engineering
- b. ISBN/ISSN : 978-1-5090-1434-7, Hal : 177-182
- c. Thn Terbit, Tempat Pelaks. : Semarang, 18-19 Oktober 2017
- d. Penerbit/Organiser : Departement of Electrical Engineering, Diponegoro University
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a. Kelengkapan unsur isi prosiding (10%)	2,50		2
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d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7,50		7
Total = (100%)	25,00		7/23
<i>24 x 0,6 = 14,4</i>			

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Semarang,
Reviewer 1

[Signature]
 Dr. Iwan Setiawan, ST, MT
 NIP. 197309262000121001
 Unit Kerja : Teknik Elektro FT UNDIP

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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	7,50		7,5
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7,50		7,5
Total = (100%)	25,00		25
$25 \times 0,6 = 14,4$			

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- a) Kesesuaian dan kelengkapan unsur isi paper:
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- c) Kecukupan dan kemutakhiran data/informasi dan metodologi:
 metode yang cukup untuk data yang ada cukup informatif terdapat dan referensi yg lengkap dari 5 tahun dan sumber
- d) Kelengkapan unsur dan kualitas terbitan:
 rumus dan gambar terdapat sesuai makalah diterbitkan pada penerbit internasional yg terindeks scopus

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Reviewer 2


 Dr. Wahyudi, S.T., M.T.
 NIP. 196906121994031001
 Unit Kerja : Teknik Elektro FT UNDIP

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Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2	2,5	2,25
b. Ruang lingkup dan kedalaman pembahasan (30%)	7	9,5	7,25
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	7	7,5	7,25
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7	7,5	7,25
Total = (100%)	23	25	24

Reviewer 2

Dr. Wahyudi, S.T., M.T.
 NIP. 196906121994031001
 Unit Kerja : Teknik Elektro FT UNDIP

Semarang,

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Dr. Iwan Setiawan, ST, MT
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Volume 2018-January, 12 January 2018, Pages 181-186

4th International Conference on Information Technology, Computer, and Electrical Engineering, ICITACEE 2017; The Wujil Resort and Conventions Semarang; Indonesia; 18 October 2017 through 19 October 2017; Category number CFP1789Z-PRT; Code 134244

Particle swarm optimization (PSO)-based self tuning proportional, integral, derivative (PID) for bearing navigation control system on quadcopter (Conference Paper)

Sumardi ✉, Sulila, M.S. ✉, Riyadi, M.A. ✉

Electrical Engineering Department, Diponegoro University, Semarang, Indonesia

Abstract

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Unmanned Aerial Vehicle (UAV) is an unmanned aircraft that is controlled manually or automatically over long distances. The quadcopter UAV is rapidly developed in recent years due to various purposes. One of the quadcopter navigation system, the UAV moves towards different coordinates by controlling vertical axis rotation angle (yaw) or bearing. In this research, we propose self-tuning proportional integral derivative (PID) control using particle swarm optimization (PSO) method for bearing navigation. Global positioning system (GPS) is used to determine the coordinates of bearing angle to the destination. HMC5883L compass sensor is used to calculate the actual angle of the quadcopter from the earth electromagnetic field. Based on the test results, the quadcopter successfully holds fixed coordinates with settling time at 6.4s and average error after settling time is 5.4°. Based on test result of coordinate changes, the quadcopter is able to reach the aim as fixed coordinates with average error of 7.9°. In the experiment with disturbance, an average offset error of 1.89° and settling time of 4.1 seconds has been achieved. The best PSO self-tuning limits are obtained at $K_p = 0.15$ to 0.3, $K_i = 0.06$ to 0.6, and $K_d = 0.005$ to 0.1. The PSO values used were $C_1 = 1.5$, $C_2 = 2$ and the weight of inertia from 0.7 to 1.2. © 2017 IEEE.

SciVal Topic Prominence ⓘ

Topic: Unmanned aerial vehicles (UAV) | Control | quadrotor helicopter

Prominence percentile: 99.419 ⓘ

Author keywords

Bearing Navigation Particle Swarm Optimization Quadcopter Self Tuning PID

Indexed keywords

Engineering controlled terms:

Antennas Electromagnetic fields Errors Flight control systems Global positioning system Proportional control systems Tuning Two term control systems Unmanned aerial vehicles (UAV)

Engineering uncontrolled terms

Coordinate changes Navigation control systems Particle swarm optimization method (PSO) Proportional integral derivative control Quadcopter Self-tuning PID Unmanned aircrafts Vertical-axis rotation

Engineering main heading:

Particle swarm optimization (PSO)

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Unmanned aerial vehicle for observing landslide with iterative feedback tuning

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OCTOBER 18 -19, 2017



The Wujil Resort and Conventions
Semarang, October 18 - 19, 2017



DEPARTMENT OF COMPUTER ENGINEERING
FACULTY OF ENGINEERING
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The Wujil Resort & Conventions

October 18, 2017 – October 19, 2017

The 2017 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE) provides a forum for researchers, academicians, professionals, and students from various engineering fields and with cross-disciplinary working or interest in the development and design of information technology, computer system, and electrical engineering to interact and disseminate the latest issues and researches. It also offers opportunity to enjoy the heritage and the beauty of Semarang.

ICITACEE is an annual conference organized both by Department of Electrical Engineering and Department of Computer Engineering and in 2017 this conference will be organized by Department of Computer Engineering.

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1. Prof. Dr. Ir. Riri Fitri Sari, M.Sc., M.M. (University of Indonesia).
2. Azli Yahya, B.Eng., M.Sc., Ph.D. (Universiti Teknologi Malaysia).
3. Assoc. Prof. Dr. Mohamad Noorman Masrek (Universiti Teknologi Mara).

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Wednesday 18, 13.00-17.00

Track: Electric Power

Room: PWR

NO	ID	Title	Authors
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A Bi-directional Boost Converter-Based Non-Isolated DC-DC Transformer with Modular Solid-State Switches for Medium-/High-Voltage DC Grids

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Abstract— In this paper, a bi-directional non-isolated dc-dc transformer is proposed, which can be used for connecting different dc voltage levels in medium-/high-voltage dc grids. The proposed dc-dc transformer is based on the conventional bi-directional boost converter, but with modular solid-state switches to avoid the complexity of employing series-connected Insulated Gate Bipolar Transistors (IGBTs) to meet the high-voltage requirement. The modular solid-state switch consists of cascaded modules, where each module consists of Half-Bridge Sub-Module (HB-SM) along with clamping IGBT. Small module capacitance is required in the proposed architecture as it is used typically to clamp the module voltage, not to store the energy to be delivered to the load. This affects positively the lifetime of the dc-dc transformer. On the other hand, clamping IGBTs ensure a successful operation with balanced capacitors' voltages without the need for voltage or current measurements. A detailed illustration for the proposed architecture is presented along with its operational modes and controller. Simulation results for a 2MW 10 kV/25 kV dc-dc transformer are presented to show the viability of the proposed architecture.

Keywords— *Bi-directional converter; dc-dc transformer; modular solid-state switch.*

I. INTRODUCTION

The dc-dc transformer is an essential component in medium-/high-voltage dc grids for connecting two different dc voltage levels [1]. The dc-dc transformer can be classified into isolated [2-5] and non-isolated [6-10]. In the isolated type, an isolation transformer is employed to isolate between the high- and low-voltage sides.

The conventional non-isolated dc-dc boost converters are not normally used for applications requiring high voltage gains because of the difficulties with the main switch stresses [1], as the employed switches are rated at the higher voltage level. To meet the required high-voltage rating of the switch, series-connection of IGBTs [11], or multi-module dc-dc transformer configurations [9] can be used. In case of series connection of IGBTs, there are some challenges related to static and dynamic voltage sharing among the involved IGBTs. Active gate control can be deployed, yet with increasing system complexity [11].

While in case of multi-module converters, there are two possible connections [9]: cascaded converters and series converters. In cascaded converters [9], the first converter has intermediate voltage stresses and high current stresses, while the second converter has high voltage stresses and low current

stresses. In addition, there is a difficulty in the control due to the interaction between converters. In case of series converters with one dc input [9], each converter processes only half of the input power, which enhances the system efficiency, and the employed switches are rated at half of the total voltage stress, which is still high for one IGBT. To reduce the voltage rating of employed switches, multi-module (generally, n modules) can be employed by connecting their output in series, but their inputs should be isolated which necessitates isolating transformers.

In order to meet the required high-voltage rating of switches in medium-/high-voltage applications without employing series-connection of switches nor multi-module converters, multi-module-cascaded high-voltage composite switch can be employed which enables recruiting low-voltage IGBTs in high-voltage applications.

In [12], a high-voltage composite switch, which is based on Modular Multilevel Converter (MMC), is proposed. This composite switch entails cascaded modules, where each module consists of a dc capacitor, a resistor, and four IGBTs (i.e. a Full-Bridge Sub-Module (FB-SM)). The voltage balancing is guaranteed automatically during the conduction modes of this configuration. The main drawback is that the number of required gate drivers is four times that with the series-connected IGBTs.

In this paper, a modular high-voltage switch with a reduced number of IGBTs is proposed for a bi-directional boost converter-based dc-dc transformer. The proposed modular switch entails cascaded modules, where each module consists of Half-Bridge SM (HB-SM) (each SM has two IGBTs and a small dc capacitor) along with clamping IGBT. The capacitance of the HB-SM is small, as the dc capacitor is used as a snubber circuit to clamp the voltage of the HB-SM not to store the energy to be delivered to the load. While clamping IGBTs are employed to ensure balanced capacitors' voltages during the operation without the need for voltage or current measurement. The modular switch's modules are operated with Marx concept, i.e. basic cell for Marx [13] is employed, where the capacitors are connected in parallel during the bypass mode (turn-on) of the modular switch, and are connected in series during the turn-off period of the modular switch. The HB-SMs' capacitances should be selected small enough to ensure insignificant effect on the boost converter operation and to limit the inrush current emanated from the repetitive switching of modules' capacitors during the operation. Detailed illustration and design for the proposed architecture are presented in the following sections.

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Regulatory Framework Creation Analysis to Reduce Security Risks The Use of Social Media in Companies

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Abstract— Companies, agencies and individuals currently use social media as a means of communication and business facilities, because through social media the staffs can connect globally in expressing ideas, feelings or emotions. However, social media users need to be aware of the security risk to their organization. In this paper, we present a perception of the risks, benefits, and strategies of social media applications developed from societies that use social media in the company by discussing existing regulations and how they apply to the use of social media by companies/institutions also to overcome this challenge. From this research, a solution is made for companies whose security rules are being used by the public. This regulatory framework can serve as a basis for establishing company internal policies for the use of social media by its employees. With the creation of policies that are the result of this study, companies that have the maximum ability in the field of information technology.
Keywords— Social media, security risk, privacy, Security policy

I. INTRODUCTION

Social media are common today. Social media is used for communication, from sending messages to sharing many things with the community and the people closest. The popularity of social media in the internet world has been widely used to build a network of friends to business networks, this forces businesses to adapt marketing strategies and involve social media as a marketing tool[1]. Some companies today are even actively creating specialized corporate social media communities such as corporate Twitter channels, YouTube channels, or Facebook fan pages. Social media are generally used for communication facilities in the company or as a media campaign and marketing[2].

The popularity of social media cannot be separated from the security risks that threaten users. The threat of this risk certainly affects the companies that are actively involved in social media and not alert[3]. Mistakes in using social media can lead to customer attacks, negative publicity and reputation damage to the company[4].

In addition to this, organizations are also facing threats from their own employees who often post on social media on behalf of the organization either through their personal

accounts or company accounts. Other risks received can include phishing, information leakage, malware to hacking.

Social media policies are seen as an important part of the organization[5]. The regulatory framework is an important aspect of controlling the use of social media within corporations[6]. In this paper, we find the risks of using social media to develop more effective strategies to decrease the security threat by social media to companies through the establishment of a regulatory framework.

II. SOCIAL MEDIA SECURITY RISKS

The development of an increasingly modern era encourages the change of the system, either directly or indirectly, as in a company. Technological advances, especially the internet make the limitations of distance, time and cost can be easily overcome. Implementation of technology, in this case, to improve business, sales and buy of products is to use electronic commerce[7]. Company policies that are made for enterprise information security from social media are often only accepted for that purpose without being read and understood by users. The implications are privacy and security[8].

Through good communication, a company will feel comfortable and cut the perception of corporate risk, and ultimately can influence consumers in determining decisions in a company through social media. In accordance with research conducted by Khailil Leonil (2015) which states that perceived risk perception of consumers have a significant impact on online decisions, and related to the existence of online fraud, the company always pay attention to the quality of service in terms of risk perception, this is due to perception Risk contains uncertainty of a risk situation in a company that is product risk, transaction risk and psychological risk[9].

Understanding the perception of risk is needed[10]. Every person within a company has different perceptions of risk. A member of the IT department will see viruses or malware as a risk that could impact data loss on the company,

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A Multiple Classifiers Broadcast Protocol for VANET

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Abstract—Many types of artificial intelligent machines have been used for decision making purposes. In VANET broadcast protocols, vehicles must decide the received messages are to be rebroadcast or not. Several attributes such as sender-to-receiver distance, sender-receiver speed difference, number of neighboring vehicles, as well as vehicle's movement direction are important measures to take the broadcast decision. As the relationships of attributes to the broadcast decision cannot be mathematically defined, the use of a classifier-based artificial intelligence may approximately predict the relationships of all the incorporated attributes to such a decision. As the decision is based on prediction, the use of multiple classifiers in decision making may increase accuracy. Therefore, this research employs a combined-classifiers at an abstract level to provide firmer broadcast decisions on VANET. Our research results justify that the performance of our combined multiple-classifiers outperformed a single-classifier scheme. The multi-classifiers scheme contributes to an average increase of 2.5% in reachability compared to that of the efficient counter-based scheme (ECS). The combined multi-classifiers scheme also improves the saving in rebroadcast tries by 38.9%.

Keywords—Broadcast-storm, classifier, VANET, vehicular attribute.

I. INTRODUCTION

An efficient broadcast has always been a hot issue in broadcast protocol area. Several schemes have been available, from heuristic (e.g. probability-based, counter-based broadcast) to topology-based broadcast (e.g. distance-based broadcast). However, most of the solutions have used mostly only a few attributes (whether local or global), such as the use of sender-to-receiver distance, number of message duplicates received, or even only employing probability to reduce the number of nodes/vehicles that rebroadcast messages to mitigate the broadcast-storm problem (the massive message redundancy, contention and collision) [1, 2, 3, 4].

In reality, considering many attributes in the broadcast decision mechanism may lead to a more efficient broadcast scheme. For example, a vehicle having a greater distance from the sender vehicle is more potential to rebroadcast messages than that of having a smaller distance. Likewise, a vehicle that has a higher speed differential to the sender is considered to be a better broadcast candidate as it will go out from the sender's

radio coverage fast. The number of neighboring vehicles can also be used to select the rebroadcast candidates. The denser the neighbors, the smaller the probability for a vehicle to rebroadcast. Therefore, a multiple-attributes scheme are more probable to outperform a single-attribute scheme if such attributes are properly treated.

To properly handle the attributes, a classification algorithm (known as a classifier or an expert) can be used to examine all the possible situations of the attributes dealing with current vehicular network situation. For example, a greater distance threshold should be applied for vehicles deserved rebroadcast in a dense network. However, a smaller threshold is required to maintain high network reachability. A classifier is able to recognize the input conditions of the attributes and to make decisions based on the knowledge obtained from prior training (called as model). Our work employs the following attributes: sender-to-receiver distance, number of message copies, vehicular density, as well as speed differential and movement direction.

Discussion of the research are presented in what follows. Research in broadcast protocols are presented in section 2. Sections 3 and 4 discuss how our experiments are set up and experimented. Results of the study are presented and discussed in section 5 and conclusions can be found in section 6.

II. THE BROADCAST-STORM MITIGATION SCHEMES

One simple method to reduce the broadcast-storm is to use a probabilistic approach. The probabilistic based scheme uses probability mechanism for node selection rather than using a threshold mechanism (such as in distance-based threshold) for determining rebroadcast nodes. Basic broadcast techniques in VANETs follow either a l -persistence or a p -persistence scheme. The l -persistence scheme has the advantages of low complexity and high penetration rate, but creates massive redundancy. The p -persistence scheme may reduce message redundancy but may increase in total latency and degraded penetration rate. For example, literature [5] proposed three schemes: weighted p -persistence, slotted l -persistence, and slotted p -persistence broadcast schemes, whilst literature [6] proposed an adaptive probabilistic based scheme that senses idle channel time to represent the broadcast probability.

Analysis of Custody Transfer on Moving Bundle Protocol of Wireless Router in Delay Tolerant Network (DTN)

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Abstract—Delay Tolerant Network (DTN) is a network architecture to provide a solution for networks which have intermittent connectivity, long delay, a different data rate and high error rate. DTN is used as an alternative solution for communication networks in remote areas. DTN communications model based on the nodes mobility to transmit data between nodes which geographically separated so if disconnection problem happens when data transfer is running, bundle which already has been sent will remain stored in the last node where the data reached, and then when connection reconnects, the data transfer process can be continued without repeating the process from the beginning until the data reaches the destination node. This paper analyzes the custody transfer on moving bundle protocol of wireless router in a DTN. The analysis uses a delivery data scenario that implements a wireless router moving on a DTN Network by showing custody transfer bundle protocol and takes into account the time of transfer in any data from DTN log. The scenario considers two conditions, namely the LoS (Line of Sight) and n-LoS (near Line of Sight) with distance and data variation. Experimental results show the important role of the custody transfer agent in DTN network.

Keywords—Delay Tolerant Network; Custody Transfer; Bundle Protocol; Wireless Router; Digital Courier

I. INTRODUCTION

The concept of Delay Tolerant Network (DTN) can be applied on the network by utilizing the tools which acts as a digital courier to spread data from one place to another [1]. Digital courier itself is in the form of wireless routers which move to the area which requires network access and data collection. The digital courier moves to a place which has the connection access and processes those requests so that internet services can be applied and presented to an area which has the following characteristics: long delay, high rate of loss, and the low level of connectivity [2]. Bundle layer or bundle protocol is the main protocol used in DTN. Bundle layers have role to save and forward the whole or a portion of the bundle between the nodes.

In DTN, there is a term called the custody transfer. Custody transfer [3] is a mechanism to improve reliability of delivery using the hop-by-hop reliability, one or more hops, with no end-to-end connectivity thru more reliable and responsible transferring of delivery. Custody Transfer gives responsibility in every data transfer to destinations between its nodes (node to node one another). In this work people are modelled as carrier routers (digital couriers) with intermediate delivery of data between servers and clients using DTN.

The rest of the paper is organized as follows. Related works on mapping research area is described in Section 2. Section 3 presents the experimental scenario. Section 4 discusses the result. Finally, Section 5 provides our conclusion and identified potential future work to be carried out in this area.

II. RELATED WORKS

Bundle layer or bundle protocol [4] is the main protocol which used in DTN. Bundle layer is in charge of storing and forwarding the whole or part of bundles between nodes. A bundle layer protocol is used when across all networks (region) in the DTN, it supports resending the data from one node to another, which being damaged and lost on both transport layer and bundle. Unfortunately, in a proposal by [5] there was not a single transport layer which works end-to-end at DTN. It means that the end-to-end reliability can only be implemented in the bundle layer.

Meanwhile, proposals by [3] and [6] described the custody transfer or "sending custody data" was performed on nodes which have been successfully received a bundle. This node which will send a bundle will ask the next node to send bundle acknowledgment. If the next node was ready to accept a bundle then the acknowledgment will be sent to the previous node.

III. EXPERIMENTAL SCENARIO

The research is conducted through a series of experiments using simulation consisting of three devices (laptops) which act as server, router, and a client. Scenarios consider two

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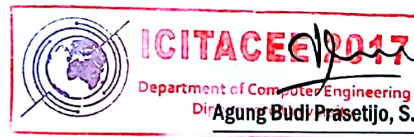
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