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

Judul Karya Ilmiah : Design of High Throughput Wireless Printer Server Based on IEEE 802.11n
Jumlah Penulis : 4 orang (**Wahyul Amien Syafei**, Akbar, F., Sulistyawati, R.I., Santoso, I.)
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Design of High Throughput Wireless Printer Server Based on IEEE 802.11n

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One of the problems in printing a document is the desired application program is not available on the
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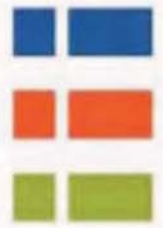
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A Development of Executive Information Based on
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Design of High Throughput Wireless Printer Server Based on IEEE 802.11n

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Abstract— One of the problems in printing a document is the desired application program is not available on the computer that connected to the desired printer. In this case, a user must install all the application programs to the dedicated computer or server. Other problem arises when multiple users want to print on the same printer. This is solved by using a Printer Auto Sharing Switch that allows a printer to be accessed by multiple users, but the number of the user is limited by the number of port and the length of the cable. Sharing the printers via local area network also allows multiple users to access the printers, but the connected computer should be always on during the printing process. A wireless printer can be accessed by several users wirelessly, but the price is still relatively expensive. Wireless Printer Server can change the general printer to be wirelessly accessed, but it can only handle one printer. The recent expensive wireless printer server can handle some printers, but the data rate is low. This paper presents the design of high throughput wireless printer server based on IEEE 802.11n. This device can handle several local traditional printers and allows several users to print documents wirelessly. It also provides high data rate transmission up to 300 Mbps between user's computers to the desired printers.

Keywords— *High throughput, wireless printer, wireless printer server, IEEE 802.11n,*

I. INTRODUCTION

A printer is a device to print documents. The problem occurs when the server connected to the desired printer does not have the application programs of documents to be printed (e.g. Auto Cad, Corel Draw, etc.) or a computer has the application program but does not have the driver of the desired printer. In these cases, a user must first install all the application programs on the connected server or install the printer driver on his computer. Another problem arises when several users want to print on the same printer. This can be solved by using Printer Auto Sharing Switch which allows a printer to be accessed by several users. [1] However the number of the user is limited by the number of the port, the length of the cable, and the printer cannot be accessed wirelessly. To be able to access the printer wirelessly, it can be shared via a local area network, but there must be a single computer that is always on during the printing process. [2] A wireless printer can be accessed by several users wirelessly, but the price is still relatively expensive. Wireless printer server extends the printer server with wireless technology. It allows a printer to be accessed by several users wirelessly without requiring a master computer. However, it only can handle one

printer. [3]. The recent expensive wireless printer server can handle a max of four printers, but the data rate transmission is still low, i.e. 54 Mbps and the product is already discontinued [4].

Design of wireless printer server using Raspberry pi allows printing a document directly through handheld devices to a traditional local printer. This design not only eliminates the need for wireless printer but also the use of the desktop computer which is connected to the printer. However, the used wi-fi technology is still low, i.e. 54 Mbps. [5].

Another discussion accessing printer wirelessly is reported in [6]. A text which is sent via short message service (SMS) is received by 8051 microcontrollers, then forwarded to the printer for printing. This system is applied to fast food reservations. However, it only can handle short text.

This paper presents the design of high throughput wireless printer server using wireless router TL-MR3420 which is based on IEEE 802.11n. This device can handle several Inkjet/ Deskjet printers and allows several users to print documents wirelessly. It also provides up to 300 Mbps high data rate transmission to the desired printers.

II. DESIGN OF HIGH THROUGHPUT WIRELESS PRINTER SERVER

The scenario of the proposed high throughput wireless printer server (HT WPS) system is illustrated in Fig. 1. There are three local traditional printers want to be shared wirelessly. Instead of using an expensive but low - throughput wireless printer server, a high throughput wireless router is employed. Some users can access those printers to print their documents wirelessly.

Hardware and software used in this design are: one Wireless Router TL-MR3420, one universal serial bus (USB) hub 7 ports, three printers: Canon IP2770, Canon IP1800, and HP Deskjet 3920, 8GB USB Flash Drive, OpenWRT Attitude Adjustment 12.09 Beta [7], CUPS [8], Putty, App. Serv., and Web Browser. Diagram of the design steps is shown in Fig.2.

A. Configuring the wireless router

The heart of the proposed system is a high throughput wireless router TL-MR3420 [9]. Wi-fi technology used by this device is IEEE 802.11b/g/n which can provide physical layer (PHY) data transfer up to 300 Mbps. [10, 11, 12]. It has one USB port which can be used to insert a custom firmware to change it from a general router into desired wireless printer server. The factory firmware is replaced or flashed using OpenWRT. The

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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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