Lecture Notes in Networks and Systems 395

Prasant Kumar Pattnaik
Mangal Sain
Ahmed A. Al-Absi *Editors*

Proceedings of 2nd International Conference on Smart Computing and Cyber Security

Strategic Foresight, Security Challenges and Innovation (SMARTCYBER 2021)

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Preface

The 2nd International Conference on Smart Computing and Cyber Security—Strategic Foresight, Security Challenges and Innovation (SMARTCYBER 2021) took place in Kyungdong University Global Campus, Gosung, Gangwondo, South Korea, during October 28–29, 2021. It was hosted by the Department of Smart Computing, Kyungdong University, Global Campus, South Korea.

The SMARTCYBER is a premier international open forum for scientists, researchers, and technocrats in academia as well as in industries from different parts of the world to present, interact, and exchange the state of art of concepts, prototypes, innovative research ideas in several diversified fields. The primary focus of the conference is to foster new and original research ideas and results in the five board tracks: Smart Computing Concepts, Models, Algorithms, and Applications, Smart Embedded Systems, Bio-Inspired Models in Information Processing, Technology, and Security. This is an exciting and emerging interdisciplinary area in which a wide range of theory and methodologies are being investigated and developed to tackle complex and challenging real-world problems. The conference includes invited keynote talks and oral paper presentations from both academia and industry to initiate and ignite our young minds in the meadow of momentous research and thereby enrich their existing knowledge.

SMARTCYBER 2021 received a total of 89 submissions. Each submission was reviewed by at least three Program Committee members. The committee decided to accept 39 full papers. Papers were accepted on the basis of technical merit, presentation, and relevance to the conference. SMARTCYBER 2021 was enriched by the lectures and insights given by the following seven distinguished invited speakers: Professor Prasant Kumar Pattnaik, Professor, School of Computer Engineering, Kalinga Institute of Industrial Technology, Professor Evizal Abdul Kadir, UIR Indonesia and visiting scholar at Harvard University—USA, Dr. James Aich S., CEO Mindzchain Co. Ltd, South Korea, Prof. Mangal Sain, Dongseo University, South Korea, and Prof. Ahmed A. Al-Absi, Kyungdong University Global Campus, South Korea. We thank the invited speakers for sharing the enthusiasm for research and accepting our invitation to share their expertise as well as contributing papers for inclusion in the proceedings. SMARTCYBER 2021 has been able to maintain

standards in terms of the quality of papers due to the contribution made by many stakeholders.

We are thankful to the Program Chair Prof. Baseem Al-athwari, Publication Chair Prof. Md. Nur Alam, Organizing Chairs: Prof. Jay Sarraf, Prof. Grace C. Kennedy, Prof. Nur Khadak Singh Bhandari, and Zubaer Ibna Mannan for their guidance and valuable inputs.

We are grateful to Prof. John Lee, President of Kyungdong University (KDU) Global Campus, South Korea, and Honorary General Chair, SMARTCYBER 2021, for his constant support for them and providing the infrastructure and resources to organize the conference. We are thankful to Prof. Sasmita Rani Samanta, Pro-Vice-Chancellor, KIIT Deemed to be University, India, Honorary General Chair, SMARTCYBER 2021 for providing all the support for the conference.

Thanks are due to the Program and Technical committee members for their guidance related to the conference. We would also like to thank the Technical Program Committee, Publicity Chairs, Organizing Committee, Finance Chairs, and Web Management Chair who have made an invaluable contribution to the conference. We acknowledge the contribution of EasyChair in enabling an efficient and effective way in the management of paper submissions, reviews, and preparation of proceedings. Finally, we thank all the authors and participants for their enthusiastic support. We are very much thankful to the entire team of Springer Nature for timely support and help. We sincerely hope that you find the book to be of value in the pursuit of academic and professional excellence.

Gangwondo, Korea (Republic of) — Ahmed A. Al-Absi
Bhubaneswar, India — Prasant Kumar Pattnaik
Busan, Korea (Republic of) — Mangal Sain

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Editors and Contributors

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Prasant Kumar Pattnaik Ph.D (Computer Science), Fellow IETE, Senior Member IEEE is a Professor at the School of Computer Engineering, KIIT Deemed University, Bhubaneswar. He has more than a decade of teaching and research experience and awarded half dozen of Ph.D. Dr. Pattnaik has published numbers of Research Papers in peer-reviewed International Journals and Conferences and filed many patents. He also edited book volumes in Springer and IGI Global Publication. His areas of interest include Mobile Computing, Cloud Computing, Cyber Security, Intelligent Systems and Brain Computer Interface. He is Intelligent Systems Book Series Editor of CRC Press, Taylor Francis Group.

Mangal Sain received the Master of Application degree from India in 2003 and the Ph.D. degree in computer science from Dongseo University, Busan, South Korea, in 2011. Since 2011, he has been an Assistant Professor with the Department of Information and Communication Engineering, Dongseo University, Busan, South Korea. He has published over 40 international publications. His current research interests include wireless sensor network, middleware, cloud computing, embedded system, and Internet of Things. He is a member of TIIS and has participated as a TPC member in several international conferences.

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Speech Recognition Mobile Application for Learning Iqra' Using PocketSphinx

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1 Introduction

Quran is a holy book of Moslem that conceives the teaching of Islam and is used as a guidance to live in this world and the hereafter. Every Moslem is obligated to recite and learn the Quran in order to fully understand and follow the teaching. By learning the Quran properly and thoroughly, the misinterpretation of the Quran could be avoided to have a peaceful life.

Reciting the Quran is an important activity for Moslems because it is believed as a way to receive the reward from God abundantly. Learning the Quran is quite hard for self-learning. Most of the time, an expert that teaches Quran is available at mosque and special schools with a fixed schedule. Sometimes, it is difficult for adults to adjust their time to join the programs. Due to the complexity conceived in learning Quran and the time concern for those who wish to learn from the expert, technologies that enable people to learn fastly, easily, and independently are highly needed.

Several methods had been invented to help learning and reciting the Quran. One of the old and famous methods to learn the Quran in Indonesia is by using a book named Iqra. This book was invented in the 1990s and is still being used now. Iqra helps people to read and recite Arabic letters and words that are used in the Quran. Studies on development of language resources are conducted for low-resource languages like Arabic language [1] and Indonesian ethnic languages [2–7]. Learning the Quran is not merely about knowing the letters or words, but there are rules that should be followed accordingly. In Iqra, those rules such as makhraj and tajwid are taught in the simplest way. Makhraj is how the Arabic letters should be read/pronounced and Tajwid is the rules that should be followed so that the meaning of the words is conveyed correctly.

Several studies showed good use of information technology in helping people learning Quran [8–12]. Some studies had done on developing multimedia tools and applications to learn Iqra [13, 14]. However, the multimedia tools are limited to convert the printed Iqra to a digital one and direct how the words are pronounced.

Speech recognition is a current technology that is massively being developed. This technology enables a computer to process speech into written text and vice versa. A few

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studies had been conducted implementing speech recognition in learning Quran [15] that uses machine learning application as a classifier by comparing the accuracy from three different classifiers (i.e., random forest, J48, and Naïve Bayes) with the highest accuracy of 0.8 for random forest and Naïve Bayes. Another study conducted [16] uses the Mel Frequency Cepstrum Coefficient (MFCC) method as a voice feature extension. This study carried out a high percentage of the accuracy of the speech recognition, however, the training data set that is being used was level one (1) of iqra which provides basic hijaiyah or single word only. Pocketsphinx has been used in the development of Android-based speech recognition applications in several domains [17–20].

This study aims to apply speech recognition using Mel Frequency Cepstrum Coefficients and Hidden Markov Model using PocketSphinx [21]. We try to figure out the accuracy of the speech recognition applied and factors that might be able to work on the accuracy. Furthermore, mobile phone application is used to help Moslems in learning Quran easily while correcting the mistakes when pronouncing the Arabic letters and words fastly and independently.

2 Research Method

In this study, there are 2 types of data collected for data training: vocab data and speech data. The vocab data is the data that contains a collection of hijaiyah/Arabic words. There are 70 words from the Iqra' book collected. The speech data is the data that contains a collection of voice recording data. We record the voices of 6 trainers with various range of age and different gender by using an audio recorder. Each trainer is asked to record the voice 4 times for each word in a quiet room. There are 1,168 voices recorded as data that consist of 292 male voices data, 292 female voices data, 292 boy voices data, and 292 girl voices data.

2.1 Speech Recognition

The first process in voice processing (speech recognition) is feature extraction. Feature extraction is a process to characterize the changing of sound data into image data in the form of a wave spectrum. The vocal structure is presented in the envelope of the short-time spectrum of power, and the function of the MFCC (Mel Frequency Cepstral Coefficients) is to represent this envelope accurately. Hidden Markov Model (HMM) is a statistical model of a system that assumes a Markov process with unknown parameters. In HMM, the state cannot be observed directly, but what can be observed are the variables that are affected by the state. Each state has a probability distribution of possible output tokens. The token sequence generated by the HMM, therefore, provides some information about the sequence of states. The results of the feature extraction process in the form of mel cepstrum will be compared with the phonetic file in the training data, after obtaining the appropriate pattern, the system will provide text output to the user.

The training process is a process where vocab data and speech data are processed to produce output in the form of training data that will be used as a dataset on the system. The training process is carried out as shown in Fig. 1. The vocab data was inputted

into the system, then the data is compiled using the Sphinx Knowledge Base Tools[1] to generate dictionary files and language model files. The speech data was inputted and converted using an online Audio Converter into an audio file with WAV (Waveform Audio Format) format, monotype, 16-bit resolution, and 16,000 Hz sampling rate. All these files will be entered into the pocket sphinx.

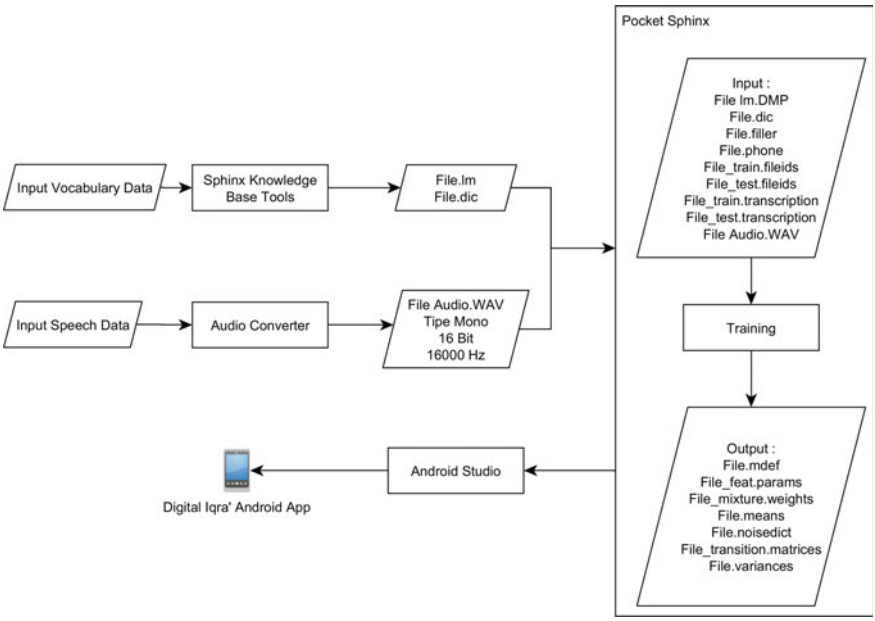

Fig. 1. System architecture

At the training stage, a number of data are needed such as dictionary files, language model files, filler files, phone files, transcription files, file ids, and WAV files. This training stage will produce output in the form of training data consisting of mdef files, feat.params files, mixture_weights files, means files, noisedict files, transition_matrices files, and variances files that will be used in android studio. At this stage, the model is deployed into Android apps. The steps are as follows:

[1] http://www.speech.cs.cmu.edu/tools/lmtool-new.html.

Data Training Processing

```
private void setupRecognizer(File assetsDir) throws
IOException {
    recognizer = SpeechRecognizerSetup.defaultSetup()
      .setAcousticModel(new File(assetsDir, "folder_akustik"))
      .setDictionary(new File(assetsDir, "file.dic"))
      .setRawLogDir(assetsDir)
      .getRecognizer();
    recognizer.addListener(this);
    File hijaiyahGrammar = new File(assetsDir, "file.gram");
    recognizer.addGrammarSearch(DIGITS_SEARCH,
           hijaiyahGrammar);
}
```

The program logic design is a flowchart that will clarify the application of this digital iqra' as shown in Fig. 2. The user can start speaking and giving a voice input by pressing the mic button, the system will perform the feature extraction process and compare the voice data with the training data. Then the system will give a result in the form of the word hijaiyah output. If the output word hijaiyah is the same as the target word hijaiyah listed on the form, a correct notification will appear, however, if the output word hijaiyah is not the same as the image, an incorrect notification will appear and the system will play the pronunciation audio of the correct hijaiyah words.

3 Result and Discussion

System testing is carried out to determine the validity of the final result or output of the system in the form of text and sound. This test uses training data as many as 1,168 speech sound data files that represent 73 hijaiyah words in the dictionary. Figure 3 shows the Mobile Application Digital Iqra' interface. Black box testing is carried out to evaluate whether the application can recognize the exact hijaiyah words or not.

To determine whether the distance from the sound source to the microphone can affect the accuracy of the system, 2 experiments were carried out by trained speakers where the speaker's voice was recognized by the system with different distances, which are 5 cm for the first experiment and 10 cm for the second experiment.

The result of the first experiment shows that from the results of testing the program from a total of 292 trials, the total average accuracy is 72.94%. While for the second test, the total average accuracy is 68.49%. Based on the two tests above, it can be concluded that the safe distance from the sound source should be about 5 cm to get the best result.

As shown in Table 1, the experiment was carried out on 73 hijaiyah words. The experiment was carried out by 6 speakers, which are 4 trainers (i.e., a male, a female, a boy, and a girl) and 2 testers (i.e., a male and a female). Each speakers needs to record 4 voices for every hijaiyah word. The accuracy of the Mobile Application Digital Iqra' is shown in Fig. 4.

The result shows that the application can detect testers' voices with just 10.27% and 8.94% decrease in accuracy compared to the trainers' voice for male and female, respectively. The accuracy for the boy and girl trainers are lower than the male and female trainers due to the low pronunciation quality and consistency of the young trainers during the training phase.

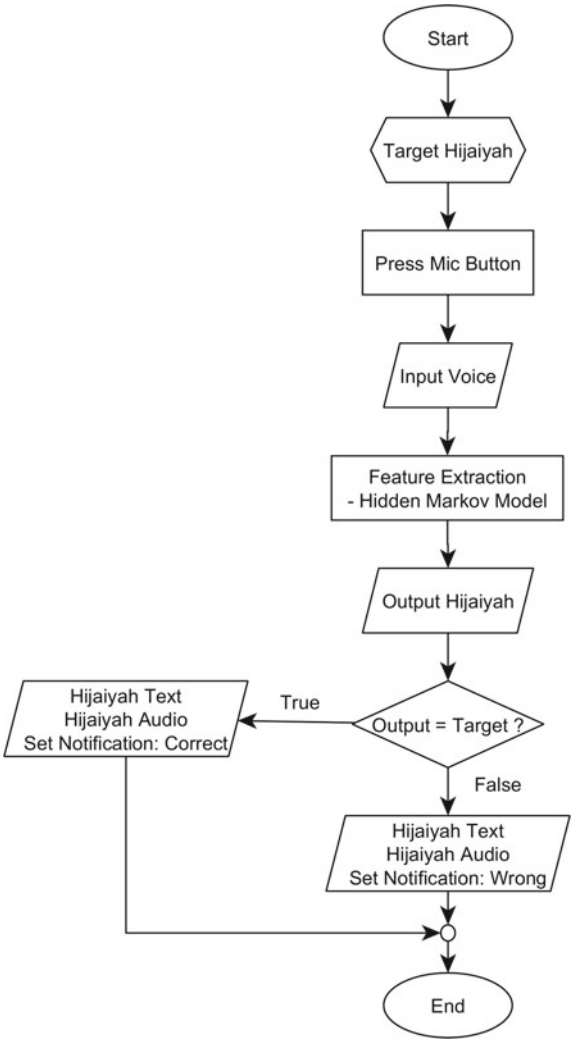

Fig. 2. System workflow

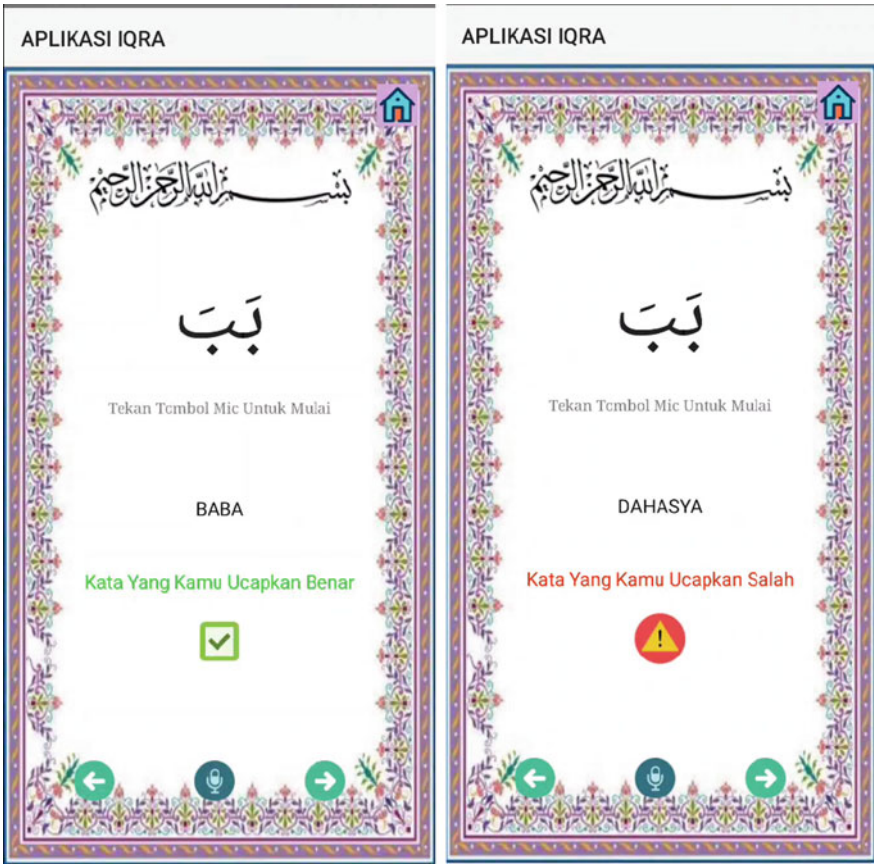

Fig. 3. Mobile application digital Iqra' interface

Table 1. List of 73 Hijaiyah word and pronunciation

No	Word	Pronunciation
1	بَبَ	Baba
2	بَذَ	Badza
3	جَمَ	Jama
4	كَنَ	Kana
5	خَدَ	Khoda
6	يَتَ	Yata
7	يَسْ	Yasya
8	نَفَ	Nafa
9	غَظَ	Ghozo
10	صَحَ	Shoha
11	طَهَ	Thoha
12	قَكَ	Qoka
13	صَدَ	Shoda
14	بَنَنَ	Banana
15	بَنَرَ	Banaro
16	بَدَرَ	Badaro
17	زَهَبَ	Zahaba
18	وَنَذَ	Wanadza
19	نَبَتَ	Nabata
20	يَدَنَ	Yadana
21	نَزَلَ	Nazala
22	بَتَرَ	Bataro
23	جَعَلَ	Ja'ala
24	نَبَغَ	Nabagho
25	نَفَلَ	Nafala
26	طَبَقَ	Thobaqo
27	حَكَمَ	Hakama
28	كَدَرَ	Kadaro
29	جَلَلَ	Jalala
30	ظَلَمَ	Zolama
31	بَلَغَ	Balagho
32	كَمَدَ	Kamada
33	قَلَمَ	Qolama
34	كَهَنَ	Kahana
35	سَهَيَ	Sahaya
36	دَهَشَ	Dahasya

No	Word	Pronunciation
37	لَهَبَ	Lahaba
38	طَلَعَ	Thola'a
39	مَنَحَ	Manaha
40	سَيَبَ	Sayaba
41	تَبَنَ	Tabana
42	لَضَلَل	Ladholala
43	فَبَلَغَ	Fabalagho
44	لَسَلَكَ	Lasalaka
45	لَنَبَاَ	Lanabaa
46	لَاَكَلَ	Laakala
47	لَلَاَمَ	Lalaama
48	لَاَمَرَ	Laamaro
49	بَلَدِ	Baladi
50	لَزَمَ	Lazima
51	سْحِدَ	Syahida
52	بَطَاَحِ	Bathoihi
53	خَشِعَ	Khosyi'a
54	قَتَرَتِ	Qotaroti
55	رَضِيَ	Rhodiya
56	حَسَنِ	Hasani
57	نَبَتِ	Nabati
58	نَجَسِ	Najasi
59	فَكَرِحَ	Fakariha
60	حَفِظَ	Hafizo
61	حَسُنَ	Hasuna
62	كَرُمَ	Karuma
63	يَمُنَ	Yamuna
64	بَايِنَ	Baayina
65	لَاَحَبَ	Laahaba
66	لِبَاسِ	Libaasi
67	يَكُنُ	Yakuunu
68	يَتُبُ	Yatuubu
69	تَوَابَ	Tawaaba
70	حَاسَدَ	Haasada
71	كَاتِبِ	Kaatibi
72	مَالِكِ	Maaliki
73	وَكِيْلُ	Wakiilu

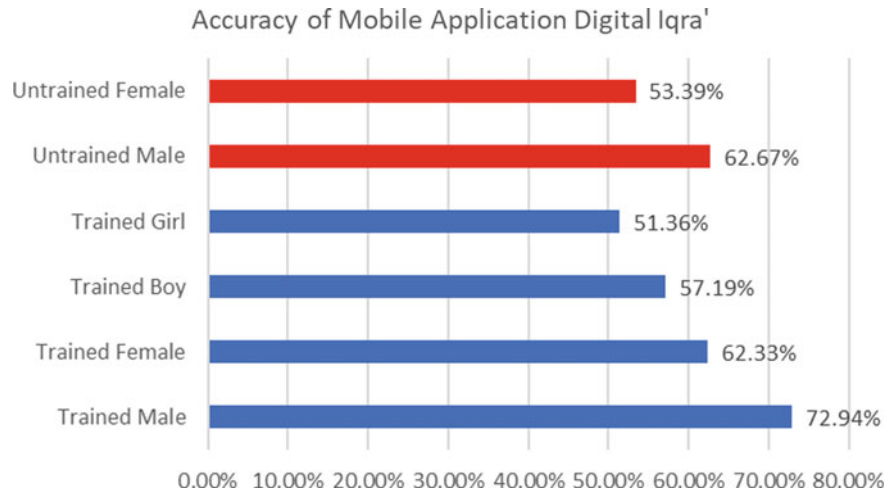

Fig. 4. Accuracy of mobile application digital Iqra'

We conducted usability testing for the mobile application digital iqra'. This testing is conducted to analyze the applicability of the mobile application. There are 6 questioner items being asked to 20 participants with different gender and various range of ages. Three scales are applied as measurements (i.e., Good, Fair, and Bad). The questionnaire items are as shown in Table 2. According to the usability testing result, 18 out of 20 participants perceive that the mobile application is useful and 17 out of 20 participants think that the user interface of the mobile application is good. The average usability testing of the mobile application is 76.67% which means the usability of the mobile phone is quite high.

Table 2. Usability testing of mobile phone application results

Items	Good	Fair	Bad
User interface	17	3	0
Useful	18	2	0
Functionality	15	5	0
Pleasant	12	8	0
Understandable	15	5	0
Recommended to be used	15	5	0
Average	76.67%	23%	0%

4 Conclusion

The result shows that the safe distance from the sound source should be about 5 cm to get the best result. The farther the sound source from the microphone, the smaller the accuracy. The result shows that the application can detect testers' voices with just 10.27% and 8.94% decrease in accuracy compared to the trainers' voice for male and female, respectively. The average usability testing of the mobile application is 76.67%, which means the usability of the mobile phone is quite high.

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경동대학교 KYUNGDONG UNIVERSITY

THE 2nd INTERNATIONAL CONFERENCE ON SMART COMPUTING AND CYBER SECURITY

October 28th ~ 29th, 2021 - Kyungdong University, South Korea

SMARTCYBER 2021 SCHEDULE

October 28th 2021; Day One Schedule

TIME	Session-1: Smart Computing Concepts, Models, Algorithms, and Applications	Session-2: Smart Embedded Systems	Session-3: Bio-Inspired Models in Information Processing	Session-4: Technology	Session-5: Security
	Chair: Dr. Khadak Singh Bhandari	***Chair:*** Dr. Zubaer Ibna Mannan	***Chair:*** Dr. Md. Nur Alam	***Chair:*** Dr. Baseem Al-athwari	***Chair:*** Dr. Grace C. Kennedy
4:00	Highly Uncertain and Dynamic Environment for Performing Varied Classes of Drone Classification	Heuristic Based SCA for Twin Robot Cooperation and Path Planning	Application of Machine Learning Algorithms to Biometric Systems- the Traits Based Performance Analytic Survey	On Disaster Recovery and its relevance to Business Continuity	A Novel Keyless LCD Based Method to Control the Latch
4:20	An Improved Kalman Filter Measurement Model Employing Regularized Least-Squares Problem	Agriculture Fertilizer Recommendation System	Cloud-based Clinical Physiological Monitoring System for Disease Prediction	Fuzzy Logics Based Recommendation Systems in E-Commerce: A Review	Cyber Security Challenges of Big Data Applications in Cloud Computing: A State of the Art
4:40	Process Discovery Algorithms Recommendation Approach	Two Factor Authentication for Safe Deposit Box Based on Embedded System	Smart Recommendation System for Hollywood Movies using Cosine Similarity Index	Emotion recognition based on Wireless, Physiological and Audiovisual Signals: A Comprehensive Survey	Attack on AI Smart Speakers with a Laser Beam
5:00	Hybrid based model face shape classification using Ensemble method for hairstyle recommender system	COVID-19 Patients Prediction Based on Symptoms Using Fuzzy Logic Approach	User Interest Based Movie Recommender System using Hybrid Computing	The Role of Information Systems in Decision Making: Case Study of the Supreme Judicial Council of the Republic of Yemen	Development of a Real-Time Home Security and Safety Management System
5:20	Prediction of Covid19 X-Ray Image Using DenseNet Transfer learning	Speech Recognition for Learning Iqra' Using Mel Frequency Cepstrum Coefficients and Hidden Markov Model	Messaging Based Intelligent Health Monitoring System Using Neuro Fuzzy	Implementation of A New Cognitive and distributed Channel Algorithm for Ad Hoc Network	Unboxing Employees Perspectives on Factors Affecting Their Compliance to Organizational Information Security Policies
5:40	Software modernization for measuring quality indicators of network traffic in the enterprise corporate network	On Tool Wear Prediction using Artificial Neural Network and Regression Methodology during Machining	Real-Time Based Covid-19 Social Distance Detection Using Deep Learning	A Privacy-Aware Framework for Financial Auditing in Digitalization Era	A Survey on Cellular Automata Based Security Systems for Information Security and Optimized Performance
18:00	Image-based Automatic Human Cell Nuclei Segmentation and Detection for Cancer Diagnosis in Digital Pathology	Development of a Data Mining subsystem for the Citeck electronic document management system	COVID-19 X-Ray Image Classification using Deep Convolution Neural Network	Early Detection of Botnet based attacks using various classification techniques on traffic behavioral features	Network Traffic Anomaly Detection Using Machine Learning Algorithm: A Comparative Study
18:20	Towards Urdu Name Entity Recognition with Self-Attention Bi-LSTM-CRF Model	Research of an intelligent system for face recognition on embedded platforms with limited computing power		IoT Architecture: Challenges and Open Research Issues	Anomaly-based Web Attacks Detection Using Machine Learning
1:30~2:00 PM	Inaugural Session SMARTCYBER 2021 by KDU Global Leaders and General Chairs				
	Keynote Day-1:				
2:00~2:30 PM	Keynote Speaker-1: Professor Evizal Abdul Kadir (UIR/Harvard University - USA)				
2:30~3:00 PM	Keynote Speaker-2: Professor Ana Hol (Western Sydney University, Australia)				

October 29th 2021; Day Two Schedule

	Keynote Day-2:
2:00~2:30 PM	Keynote Speaker-3: Professor Prasant Kumar Pattnaik (Kalinga Institute of Industrial Technology, India)
2:30~3:00 PM	Speaker-4: Dr. James Aich S (CEO Terenz Co. Ltd, South Korea)
	Speaker-5: Professor Mangal Sain (Dongseo University, South Korea)
	Speaker-6: Professor Ahmed A. Al-Absi (Kyungdong University Global Campus, South Korea)
3:00~4:00 PM	Closing SMARTCYBER 2021 & Launch of SMARTCYBER 2022 Webpage

Note: The sessions will be conducted as panel discussions in which authors give a presentation (15 minutes) of their papers, and then take (5 minutes) live questions from the panel moderators and audience. The event will be organized virtually on Zoom Software, in this regard, we have created exclusive online login and the credentials will be shared with authors only. In case you have any problem in using Zoom software, you are requested to please go through it, to enable you to join SMARTCYBER-2021 on time. For any inquiries, feel free to contact us at *smartcyber2021@gmail.com* or *absiahmed@kduniv.ac.kr* ; mobile: +821021785226

SMARTCYBER-2021 (Virtual Conference) October 28 ~ 29, 2021 - *Zoom Scheduled Meetings*

https://smartcyberconference.com/

October 28th 2021; Day One Schedule

	Presentation Sequence	Easychair Paper-ID	Zoom Topic: [SMARTCYBER-2021] SESSION-1: Smart Computing Concepts, Models Algorithms and Applications	Time	Join Zoom Meeting- Link	Zoom Meeting ID	Presenter login Name
Session-1	1	4	Highly Uncertain and Dynamic Environment for Performing Varied Classes of Drone Classification	Oct. 28, 2021 4:00 PM Seoul	https://zoom.us/j/95622171707?pwd=TWFMaU5veGxaVWFNR3IqZFI2NkFjZz09	956 2217 1707 Passcode: 1234	Presenter 4
	2	6	An Improved Kalman Filter Measurement Model Employing Regularized Least-Squares Problem	Oct. 28, 2021 4:20 PM Seoul			Presenter 6
	3	8	Process Discovery Algorithms Recommendation Approach	Oct. 28, 2021 4:40 PM Seoul			Presenter 8
	4	14	Hybrid based model face shape classification using Ensemble method for hairstyle recommender system	Oct. 28, 2021 5:00 PM Seoul			Presenter 14
	5	15	Prediction of Covid19 X-Ray Image Using DenseNet Transfer learning	Oct. 28, 2021 5:20 PM Seoul			Presenter 15
	6	42	Software modernization for measuring quality indicators of network traffic in the enterprise corporate network	Oct. 28, 2021 5:40 PM Seoul			Presenter 42
	7	45	Image-based Automatic Human Cell Nuclei Segmentation and Detection for Cancer Diagnosis in Digital Pathology	Oct. 28, 2021 6:00 PM Seoul			Presenter 45
	8	48	Towards Urdu Name Entity Recognition with Self-Attention Bi-LSTM-CRF Model	Oct. 28, 2021 6:20 PM Seoul			Presenter 48
	Presentation Sequence	Easychair Paper-ID	Zoom Topic: [SMARTCYBER-2021] SESSION-2: Smart Embedded Systems	Time	Join Zoom Meeting- Link	Zoom Meeting ID	Presenter login Name
Session-2	1	16	Heuristic Based SCA for Twin Robot Cooperation and Path Planning	Oct. 28, 2021 4:00 PM Seoul	https://us02web.zoom.us/j/86789785062?pwd=TllpaUU4QFpkY1ZTNzNlT2ZiSzhCdz09	867 8978 5062 Passcode: 1234	Presenter 16
	2	23	Agriculture Fertilizer Recommendation System	Oct. 28, 2021 4:20 PM Seoul			Presenter 23
	3	27	Two Factor Authentication for Safe Deposit Box Based on Embedded System	Oct. 28, 2021 4:40 PM Seoul			Presenter 27
	4	31	COVID-19 Patients Prediction Based on Symptoms Using Fuzzy Logic Approach	Oct. 28, 2021 5:00 PM Seoul			Presenter 31
	5	33	Speech Recognition for Learning Iqra' Using Mel Frequency Cepstrum Coefficients and Hidden Markov Model	Oct. 28, 2021 5:20 PM Seoul			Presenter 33
	6	40	On Tool Wear Prediction using Artificial Neural Network and Regression Methodology during Machining	Oct. 28, 2021 5:40 PM Seoul			Presenter 40
	7	43	Development of a Data Mining subsystem for the Citeck electronic document management system	Oct. 28, 2021 6:00 PM Seoul			Presenter 43
	8	44	Research of an intelligent system for face recognition on embedded platforms with limited computing power	Oct. 28, 2021 6:20 PM Seoul			Presenter 44
	Presentation Sequence	Easychair Paper-ID	Zoom Topic: [SMARTCYBER-2021] SESSION-3: Bio-Inspired Models in Information Processing	Time	Join Zoom Meeting- Link	Zoom Meeting ID	Presenter login Name
Session-3	1	34	Application of Machine Learning Algorithms to Biometric Systems- the Traits Based Performance Analytic Survey□	Oct. 28, 2021 4:00 PM Seoul	https://us02web.zoom.us/j/83241287356?pwd=bHB2WUqvVm5zeGRMcEJVSlRYb0xFQT09	832 4128 7356 Passcode: 1234	Presenter 34
	2	35	Cloud-based Clinical Physiological Monitoring System for Disease Prediction	Oct. 28, 2021 4:20 PM Seoul			Presenter 35
	3	37	Smart Recommendation System for Hollywood Movies using Cosine Similarity Index	Oct. 28, 2021 4:40 PM Seoul			Presenter 37
	4	38	User Interest Based Movie Recommender System using Hybrid Computing	Oct. 28, 2021 5:00 PM Seoul			Presenter 38
	5	41	Messaging Based Intelligent Health Monitoring System Using Neuro Fuzzy□	Oct. 28, 2021 5:20 PM Seoul			Presenter 41
	6	46	Real-Time Based Covid-19 Social Distance Detection Using Deep Learning	Oct. 28, 2021 5:40 PM Seoul			Presenter 46
	7	47	COVID-19 X-Ray Image Classification using Deep Convolution Neural Network	Oct. 28, 2021 6:00 PM Seoul			Presenter 47
	Presentation Sequence	Easychair Paper-ID	Zoom Topic: [SMARTCYBER-2021] SESSION-4: Technology	Time	Join Zoom Meeting- Link	Zoom Meeting ID	Presenter login Name
Session-4	1	17	On Disaster Recovery and its relevance to Business Continuity	Oct. 28, 2021 4:00 PM Seoul	https://zoom.us/j/97507124133?pwd=aXdPY2l3V25IVHFBelZYaUF2emlIUT09	975 0712 4133 Passcode: 1234	Presenter 17
	2	19	Fuzzy Logics Based Recommendation Systems in E-Commerce: A Review	Oct. 28, 2021 4:20 PM Seoul			Presenter 19
	3	20	Emotion recognition based on Wireless, Physiological and Audiovisual Signals: A Comprehensive Survey	Oct. 28, 2021 4:40 PM Seoul			Presenter 20
	4	22	The Role of Information Systems in Decision Making: Case Study of the Supreme Judicial Council of the Republic of Yemen□	Oct. 28, 2021 5:00 PM Seoul			Presenter 22
	5	25	Implementation of A New Cognitive and distributed Channel Algorithm for Ad Hoc Network	Oct. 28, 2021 5:20 PM Seoul			Presenter 25
	6	28	A Privacy-Aware Framework for Financial Auditing in Digitalization Era	Oct. 28, 2021 5:40 PM Seoul			Presenter 28
	7	29	Early Detection of Botnet based attacks using various classification techniques on traffic behavioral features	Oct. 28, 2021 6:00 PM Seoul			Presenter 29
	8	49	IoT Architecture: Challenges and Open Research Issues	Oct. 28, 2021 6:20 PM Seoul			Presenter 49
	Presentation Sequence	Easychair Paper-ID	Zoom Topic: [SMARTCYBER-2021] SESSION-5: Security	Time	Join Zoom Meeting- Link	Zoom Meeting ID	Presenter login Name
Session-5	1	1	A Novel Keyless LCD Based Method to Control the Latch	Oct. 28, 2021 4:00 PM Seoul	https://us02web.zoom.us/j/72329943877?pwd=MkJFTmFPMTR0Om5OUI3UjdkVVWnitdz09	723 299 4387 Passcode: 1234	Presenter 1
	2	3	Cyber Security Challenges of Big Data Applications in Cloud Computing: A State of the Art	Oct. 28, 2021 4:20 PM Seoul			Presenter 3
	3	5	Attack on AI Smart Speakers with a Laser Beam	Oct. 28, 2021 4:40 PM Seoul			Presenter 5
	4	18	Development of a Real-Time Home Security and Safety Management System	Oct. 28, 2021 5:00 PM Seoul			Presenter 18
	5	26	Unboxing Employees Perspectives on Factors Affecting Their Compliance to Organizational Information Security Policies	Oct. 28, 2021 5:20 PM Seoul			Presenter 26
	6	32	A Survey on Cellular Automata Based Security Systems for Information Security and Optimized Performance	Oct. 28, 2021 5:40 PM Seoul			Presenter 32
	7	36	Network Traffic Anomaly Detection Using Machine Learning Algorithm: A Comparative Study	Oct. 28, 2021 6:00 PM Seoul			Presenter 36
	8	39	Anomaly-based Web Attacks Detection Using Machine Learning	Oct. 28, 2021 6:20 PM Seoul			Presenter 39
SMARTCYBER-2021 Opening Ceremony			Zoom Topic: [SMARTCYBER-2021] Opening Ceremony	Time	Join Zoom Meeting- Link	Meeting ID	Presenter login Name
			Opening Session: SMARTCYBER 2021 by KDU Global Leaders and General Chairs	Oct. 28, 2021 01:30 PM Seoul	https://zoom.us/j/96181481654?pwd=OXE3MnBodWN1K1RLaUdqVk9YTjVDZz09	961 8148 1654 Passcode: 1234	
			Keynote Speaker-1: Professor Evizal Abdul Kadir (UIR/Harvard University - USA)	Oct. 28, 2021 02:00 PM Seoul			Speaker-1
			Keynote Speaker-2: Professor Ana Hol (Western Sydney University, Australia)	Oct. 28, 2021 02:30 PM Seoul			Speaker-2
October 29th SMARTCYBER-2021 Closing Ceremony			Zoom Topic: [SMARTCYBER-2021] Closing Ceremony	Time	Join Zoom Meeting- Link	Meeting ID	Presenter login Name
			Keynote Speaker-3: Professor Prasant Kumar Pattnaik (Kalinga Institute of Industrial Technology, India)	Oct. 29, 2021 02:00 PM Seoul	https://zoom.us/j/94019670176?pwd=dVFpc0VRSTJvSkpqWnltR2hOWVc0UT09	940 1967 0176 Passcode: 1234	Speaker-4
			Keynote Speaker-4: Dr. James Aich S (CEO Terenz Co. Ltd, South Korea)	Oct. 29, 2021 02:30 PM Seoul			Speaker-5
			*Keynote Speaker-5: Professor Mangal Sain (Dongseo University, South Korea)	Oct. 29, 2021 02:00 PM Seoul			Speaker-6
			*Keynote Speaker-6: Professor Ahmed A. Al-Absi (Kyungdong University Global Campus, South Korea)	Oct. 29, 2021 02:30 PM Seoul			Speaker-7
			SMARTCYBER 2021 Best Paper Award Closing Session & Launch of SMARTCYBER 2022 Webpage	Oct. 29, 2021 03:00 PM Seoul			

Note:

-Ensure that you have access to a stable internet connection, power supply, web camera, and headset with microphone or built-in computer audio.

-Practice using Zoom so that you can verify that you are able to turn on/off your camera and mute and unmute your microphone and share your screen. For more details, you can refer to Zoom website: https://support.zoom.us/hc/en-us/articles/201362033-Getting-Started-on-Windows-and-Mac

-Presenters are required to login with the assigned Login Name which refers to their paper ID in Easychair; i.e., Presenter 82.

-Log in to your session via the Zoom link provided for your session app 5-10 minutes before the beginning of the session.

-Watch for private chat reminders about time for your talk.

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