

2022 IEEE International Conference on Cybernetics and Computational Intelligence (CyberneticsCom) | 978-1-6654-9742-8/22/\$31.00 ©2022 IEEE | DOI: 10.1109/CYBERNETICSCOM55287.2022.9865513



PROCEEDINGS

THE IEEE CYBERNETICSCOM 2022

2022 IEEE International Conference on Cybernetics and Computational Intelligence

Malang, Indonesia
Online conference in June, 16-18 2022,

ORGANIZED BY :

CO-HOST :



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IEEE Catalog Number: CFP2230S-ART

ISBN 978-1-6654-9742-8

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**Welcome Message from General Chair
The 6th Cyberneticscom 2022**

(Thursday – Tuesday), 16th – 18th June 2022



Greetings from Malang, Indonesia! On behalf of the IEEE Indonesia Section, we would like to extend our warmest welcome to all keynote speakers, presenters, and participants at the 6th IEEE International Conference on Cybernetics and Computational Intelligence 2022 (IEEE CyberneticsCom 2022). CyberneticsCom is the flagship conference of the IEEE Indonesia Section. This scientific conference is often referred to as IEEE CyberneticsCom. This conference is a major international forum for Scientists, Researchers, Engineers, and practitioners interested in the study, analysis, design, modeling, and implementation. Implementation in Cybernetics, Machine Systems, Computational

Intelligence, Science and Engineering Systems theoretically and practically in various fields of application. The 6th IEEE CyberneticsCom 2022 is organized by Institut Teknologi Telkom Purwokerto (ITTP), supported by the IEEE The Indonesia Section Computer Society Chapter (TISCSC) and IEEE SMC Indonesia Chapter and co-host Universitas Brawijaya and Universitas Widyagama Malang. Due to the COVID-19 pandemic, it will be held as a virtual event.

IEEE Indonesia Section has conducted many activities for over 30 years in Indonesia. The IEEE Indonesia section has a good and mutual relationship with ICT organizations, Industries, governments, universities, and the Community in Indonesia. As the six years of CyberneticsCom, this conference shows its sustainability due to the hard work of the conference organizers, well-organized conference, and high-quality papers. We hope that some high-quality conferences will be continued and strengthened shortly. Therefore, the result will benefit and positively impact human beings, especially Indonesian people.

The core purpose of IEEE is to foster technological innovation and excellence for the benefit of humanity. We believe that this conference will bring researchers, academicians, scientists, students, engineers, and practitioners together to participate and present their latest research findings, developments, and applications related to the various aspects of the current state of technology and the outcome of ongoing research in the area of Cybernetics, Human-Machine Systems, Systems Science and Engineering, Computational Intelligence, Data Science, and Artificial Intelligence.

Despite the challenges, the 6th IEEE International Conference on Cybernetics and Computational Intelligence 2022 Organizing Committee and volunteers worked very hard to complete the conference program, uphold the quality of conferences, and meet the authors' expectations. IEEE CyberneticsCom 2022 aims to address the current state of technology and the outcome of ongoing research in Cybernetics, Human-Machine Systems, Systems Science and Engineering, Computational Intelligence, Data Science, and Artificial Intelligence.

I hope you all find this conference highly engaging, fruitful, and beneficial for your Fuerteventura. Your support will also make this a memorable and successful event. We wish you to stay safe, healthy, and productive.

We are looking forward to your contributions and participation.

Thank you.

Dr. Arfianto Fahmi, M.T

General Chair

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Program Schedule

Day 1: Thursday, June 16th 2022	
Time	Activity
09.00-09.10	Opening
09.10-09.25	Indonesia Raya
09.25-09.35	Welcoming speech
09.35-09.45	Welcoming speech
09.45-09.55	Welcoming speech
09.55-10.25	Keynote 1
10.25-11.55	Keynote 2
11.05-12.35	Parallel session 1
12.35-13.05	Break (video)
13.05-15.20	Parallel session 2

Day 2 : Friday, June 17th 2022	
Time	Activity
08.00-08.05	Opening
08.05-08.35	Keynote 3
08.35-10.45	Parallel session 3
10.45-10.55	Awarding (best paper & best presenter & best reviewer)
10.55-11.00	Closing ceremony

Day 3 : Saturday, June 18th 2022	
Time	Activity
09:00-10:00	Networking

**CCI-0105 : Technical Session Cybernetics, Computational Intelligence
Parallel Session 1 (Room 1)
Thursday, June 16th 2022
(11:05 – 12:35)**

Start	Finish	Papers	Authors
11:20	11:35	A Comparative Analysis of Deep Learning Models for Detecting Malaria Disease through LBP Features	Nona Zarima, Kahlil Muchtar and Akhyar Bintang (Universitas Syiah Kuala, Indonesia); Maulisa Oktiana (Syiah Kuala University, Indonesia); Novi Maulina (Universitas Syiah Kuala, Indonesia)
11:35	11:50	Designing TehNusa Mobile Based Application Using Design Sprint Method	Dinda Maylan Setianti, Daffa Raihan Zaki, Aditya Ammar Pradana and Gita Fadila Fitriana (Institut Teknologi Telkom Purwokerto, Indonesia)
11:50	12:05	Lane Keeping Control Using Nonlinear Model	Muhammad Azis Satria (Institut Teknologi Sepuluh Nopember, Indonesia); Katherin

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		Predictive Control on Constant Speed Autonomous Car	Indriawati (Institut Teknologi Sepuluh Nopember Surabaya & Faculty of Industrial Technology, Indonesia); Bambang W (Institut Teknologi 10 Nopember, Indonesia); Akhmad Ibnu Hija (Institut Teknologi Sepuluh Nopember & Engineering Physics Departement, Indonesia); Hendro Nurhadi (Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia)
12:05	12:20	Clustering Analysis of Bangla News Articles with TF-IDF & CV Using Mini-Batch KMeans and K-Means	Sakib Al Hasan and Wang Ruiqin (Huzhou University, China); Md Gulzar Hussain (Green University of Bangladesh, Bangladesh & Changzhou University, China)
12:20	12:35	Customer Clustering Based on RFM Features Using K-Means Algorithm	Wafa Essayem (University of Brawijaya & Intelligent System Laboratory, Indonesia); Fitra A. Bachtiar (Brawijaya University, Indonesia); Diah Priharsari (Universitas Brawijaya, Indonesia)

HMS-0105: Technical Session Human Machine System
Parallel Session 1 (Room 2)
Thursday, June 16th 2022
(11:05 – 12:35)

Start	Finish	Papers	Authors
11:20	11:35	Increase Customer Value Optimization (CVO) Impact on Purchase Intention in Ecommerce	Erwin Halim (Bina Nusantara University & School of Information Systems, Indonesia); Gunaputra Wardhana (Binus University, Indonesia); Agung Sasangko (Bina Nusantara University, Indonesia)
11:35	11:50	Correlation of Relationship Business Model and Business Strategy: Case Study PT Telkom IoT	Sifa Novwidia Agni (University of Indonesia, Indonesia)
11:50	12:05	User Experience Evaluation Using Integration of Remote Usability Testing and Usability Evaluation Questionnaire Method	Ajeng F Rahmawati, Tenia Wahyuningrum and Ariq Cahya Wardhana (Institut Teknologi Telkom Purwokerto, Indonesia); Anindita Septiarini (Universitas Mulawarman, Indonesia); Lasmedi Afuan (Jenderal Soedirman University, Indonesia)
12:05	12:20	User Experience Analysis on e-Wallet Using a Combination of Heuristic Evaluation and UMUX	Havinda Rosita Faradina, Tenia Wahyuningrum and Novian Adi Prasetyo (Institut Teknologi Telkom Purwokerto, Indonesia)
12:20	12:35	Utilizing Topic Modelling in Customer Product Review for Classifying Baby Product	Lay Acheadeth (West Jakarta, Indonesia, NA & Binus University, Cambodia); Nunung Nurul Qomariyah (Bina Nusantara University Jakarta, Indonesia); Misa Xirinda (Bina Nusantara, West Jakarta, Indonesia, Mozambique)

SSE-0105: Technical Session System Science and Engineering
Parallel Session 1 (Room 3)
Thursday, June 16th 2022
(11:05 – 12:35)

Start	Finish	Papers	Authors
11:20	11:35	Cybersecurity Maturity Assessment Design Using NIST CSF, CIS CONTROLS v8 and ISO/IEC 27002	Ivan Bashofi (University of Indonesia, Indonesia); Muhammad Salman (Universitas Indonesia, Indonesia)
11:35	11:50	Day Ahead Solar Irradiation Forecasting Based on Extreme Learning Machine	Adelhard Beni Rehiara (University of Papua, Indonesia); Sabar Setia Widayat (Universitas Widya Gama, Indonesia)
11:50	12:05	Optimal Sizing of BESS Considering Economic Dispatch and VRE in Thailand Generation System	Audchara Yimprapai and Surachai Chaitusaney (Chulalongkorn University, Thailand)
12:05	12:20	Evaluation of Decision Matrix, Hash Rate and Attacker Regions Effects in Bitcoin Network Securities	Agus Winarno (University of Indonesia, Indonesia); Novita Angraini (BSSN, Indonesia); Riri Sari (University of Indonesia, Indonesia); Ruki Harwahyu (Universitas Indonesia, Indonesia)
12:20	12:35	LTE Network Resource Management for Live Video Streaming in Dense Area	Borirak Moonphala, Aphirak Jansang, Withawat Tangtrongpaioj, Chaiporn Jaikao and Anan Phonphoem (Kasetsart University, Thailand)

DSC-0105: Technical Session Data Science
Parallel Session 1 (Room 4)
Thursday, June 16th 2022
(11:05 – 12:35)

Start	Finish	Papers	Authors
11:20	11:35	Machine Learning Approaches using Satellite Data for Oil Palm Area Detection in Pekanbaru City, Riau	Arie Wahyu Wijayanto, Natasya Afira and Wahidya Nurkarim (Politeknik Statistika STIS, Indonesia)
11:35	11:50	Lexicon-enhanced hate speech detection on Vietnamese social network data	Tham Nguyen Thi (University of Information Technology, Ho Chi Minh City, Vietnam); Trong-Hop Do (University of Information Technology, Ho Chi Minh City & Vietnam National University, Ho Chi Minh City, Vietnam)
11:50	12:05	Design of Image Processing Tool Using MATLAB for Freshness Assessment of Beef and Pork	Alice Jade Cabato, Leanza Clarisse Manalus, Arniño Rolusta, Ian Caesar Francisco, Emil Jann Mendoza and Jazha Alaiza Dennice Tejones (Technological Institute of the Philippines-Manila, Philippines); Anna Patricia Valeriano (Technological Institute of the

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			Philippines, Philippines); Rommel Anacan (Technological Institute of the Philippines-Manila, Philippines); Cayetano Hiwatig (Technological Institute of the Philippines, Philippines)
12:05	12:20	Identifying Social Media Conversation Topics Regarding Electric Vehicles in Indonesia Using LDA	Muchamad Taufiq Anwar (Politeknik STMI Jakarta, Indonesia)
12:20	12:35	Drone Flight Logs Sequence Mining	Swardiantara Silalahi (Institut Teknologi Sepuluh Nopember, Indonesia); Tohari Ahmad (Institut Teknologi Sepuluh Nopember (ITS), Indonesia); Hudan Studiawan (Institut Teknologi Sepuluh Nopember, Indonesia)

AIT-0105: Technical Session Artificial Intelligence
Parallel Session 1 (Room 5)
Thursday, June 16th 2022
(11:05 – 12:35)

Start	Finish	Papers	Authors
11:20	11:35	Comparative Transfer Learning Techniques for Plate Number Recognition	Rizki Rafiif Amanullah, Rifqi Akmal Saputra, Faisal Dharma Adhinata and Nur Ghaniaviyanto Ramadhan (Institut Teknologi Telkom Purwokerto, Indonesia)
11:35	11:50	IoT and AI-enabled Physical Distance Monitoring Application to Prevent COVID19 Transmission	Mohammad Dwipa Furqan (University of Hasanuddin, Indonesia); Andani Achmad (Hasanuddin University, Indonesia); Wardi Wardi (Universitas Hasanuddin & Jl. Perintis Kemerdekaan Km. 10, Indonesia); Muhammad Niswar (Universitas Hasanuddin, Indonesia)
11:50	12:05	Water Tank Level Control with Proportional Integral Derivative (PID) and Full State Feedback (FSB)	Alfian Ma'arif (Universitas Ahmad Dahlan, Indonesia); Iswanto Iswanto, Is (Universitas Muhammadiyah Yogyakarta, Indonesia); Aninditya Anggari Nuryono, Aan (Mulia University, Indonesia)
12:05	12:20	Deep Learning Approach using Satellite Imagery Data for Poverty Analysis in Banten, Indonesia	Kasiful Aprianto (Directorate Statistical Information System, BPS Statistics Indonesia, Indonesia); Arie Wahyu Wijayanto and Setia Pramana (Politeknik Statistika STIS, Indonesia)
12:20	12:35	Application of Ant Colony Optimization (ACO) Algorithm for Trans Banyumas Route Determination	Abira Armond and Yogo Dwi Prasetyo (Institut Teknologi Telkom Purwokerto, Indonesia); Wahyurini Ediningrum (STKIP Al-Amin Indramayu, Indonesia)

CCI-0613: Technical Session Cybernetics, and Computational Intelligence
Parallel Session 2 (Room 1)
Thursday, June 16th 2022
(13:05 – 15:20)

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Start	Finish	Papers	Authors
13:20	13:35	Training Autoencoders with Noisy Training Sets for Detecting Low-rate Attacks on the Network	Baskoro Adi Pratomo, Ahmad Ibnu Fajar, Royyana Ijtihadie, Abdul Munif, Hudan Studiawan and Bagus Jati Santoso (Institut Teknologi Sepuluh Nopember, Indonesia)
13:35	13:50	An investigation of ML techniques to detect Phishing Websites by complexity reduction	Md. Faiyed Bin Karim (Islamic University of Technology, Bangladesh); Tasnimul Hasan (IUT, Bangladesh); Nushera Tazreen, Safayat Bin Hakim and Samiha Tarannum (Islamic University of Technology, Bangladesh)
13:50	14:05	Channel Estimation for Compound Field Extensive Massive MIMO	Suganya T (Madras Institute of Technology & Anna University, India); Indira Gandhi (Anna University, India)
14:05	14:20	Performance Comparison of AODV, AODV-ETX and Modified AODV-ETX in VANET using NS3	Bayu Ardianto, Hery Nurcahyo and Hasan Muftic (University of Indonesia, Indonesia); Ruki Harwahyu (Universitas Indonesia, Indonesia); Riri Fitri Sari (University of Indonesia, Indonesia)
14:20	14:35	Classifying Portable Executable Malware Using Deep Neural Decision Tree	Rico S. Santos and Enrique Festijo (Technological Institute of the Philippines, Philippines)
14:35	14:50	Algorithm of Caries Classification using Co-Occurrence Matrix and Multilayer Perceptron	Yessi Jusman, Anna Widyaningrum and Sartika Puspita (Universitas Muhammadiyah Yogyakarta, Indonesia)
14:50	15:05	Intent Detection on Indonesian Text Using Convolutional Neural Network	Chiva Olivia Bilah (Gadjah Mada University, Indonesia); Teguh Bharata Adji and Noor Akhmad Setiawan (Universitas Gadjah Mada, Indonesia)
15:05	15:20	An Structural Equation Model for Predicting Determining Factor of Social CRM Adoption in SMEs	Hani Purwanti (Universitas Diponegoro & Sekolah Pascasarjana, Indonesia)
15:20	15:35	Data-Driven Modelling For Tsunami Forecasting Using Computational Intelligence	Michael Siek (Bina Nusantara University, Indonesia)

HMS-0612: Technical Session Human Machine System
Parallel Session 2 (Room 2)
Thursday, June 16th 2022
(13:05 – 15:20)

Start	Finish	Papers	Authors
13:20	13:35	-	-
13:35	13:50	The Impact on Review Credibility and Trust from Review Solicitation on E-commerce	Erwin Halim (Bina Nusantara University & School of Information Systems, Indonesia); Zahrán Muzakir (Bina Nusantara University, Indonesia); Marylise Hebrard (Institut Des Usages, France)
13:50	14:05	A Driving Situation Inference for Autopilot Agent Transparency in Collaborative Driving Context	Rinta Kridalukmana, Dania Eridani and Risma Septiana (Diponegoro University, Indonesia)
14:05	14:20	Improved Poisson MAP Algorithm for Better Image Deconvolution	Zohair Al-Ameen (University of Mosul, Iraq); Zainab Khalid Younis (University of Mosul & Computer Science, Iraq)
14:20	14:35	An Integration of End User Computing Satisfaction and Importance Performance Analysis on Website	Anggun Barokhah, Muhammad Luthfi Hamzah, Eki Saputra and Fitriani Muttakin (Universitas Islam Negeri Sultan Syarif Kasim Riau, Indonesia)
14:35	14:50	A LSTM-UNet and Zero Padding technique to detect deforestation in Amazon area	Irham Muhammad Fadhil and Aniati M. Arymurthy (University of Indonesia, Indonesia)
14:50	15:05	Method of EEG Electrode Selection for Motor Imagery Application	Oltfaz Rane, Munawar Riyadi and Teguh Prakoso (Diponegoro University, Indonesia)
15:05	15:20	Modern No Code Software Development Android Inventory System for Micro, Small and Medium Enterprises	Wahyu Nurharjadmo (Universitas Sebelas Maret, Indonesia); Mutiara Auliya Khadija (Universitas Sebelas Maret, Indonesia & Universitas Gadjah Mada, Indonesia)

SSE-0610: Technical Session System Science and Engineering
Parallel Session 2 (Room 3)
Thursday, June 16th 2022
(13:05 – 15:20)

Start	Finish	Papers	Authors
13:20	13:35	Multiple Waypoint Navigation for Mobile Robot Using Control Lyapunov-Barrier Function (CLBF)	Ridlho Khoirul Fachri, Muhammad Zakiyullah Romdlony and Muhammad Ridho Rosa (Telkom University, Indonesia)

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13:35	13:50	Performance Analysis of AWS and GCP Cloud Providers	Erina Fika Noviani (Institut Teknologi Sepuluh November & Surabaya, Indonesia); Bayu Kembara (Sepuluh Nopember Institute of Technology, Indonesia); Dyah Ayu Permata Sari (Institut Teknologi Sepuluh Nopember, Indonesia); Bakti Anugrah Yudha Pratama and Ary Mazharuddin Shiddiqi (Sepuluh Nopember Institute of Technology, Indonesia); Bagus Jati Santoso (Institut Teknologi Sepuluh Nopember, Indonesia)
13:50	14:05	Gas Turbine Anomaly Prediction using Hybrid Convolutional Neural Network with LSTM in Power Plant	Ferdiansyah Zhultriza and Aries Subiantoro (Universitas Indonesia, Indonesia)
14:05	14:20	SCR-Based Power Flow Control for Grid Integration in Home-Scale Photovoltaic System	A. Muh. Aqsha Azhar Mangkona (Hasanuddin University, Indonesia); Faizal Arya Samman (University of Hasanuddin, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)
14:20	14:35	EEMD-CNN based Method for Compound Fault Diagnosis of Bearing	Anubhuti Singh (Centre for Advanced Studies Dr A P J Abdul Kalam Technical University Lucknow, India); Arun Kumar (Centre for Advanced Studies Lucknow, India)
14:35	14:50	-	-
14:50	15:05	-	-
15:05	15:20	-	-

DSC-0613: Technical Session Data Science
Parallel Session 2 (Room 4)
Thursday, June 16th 2022
(13:05 – 15:20)

Start	Finish	Papers	Authors
13:20	13:35	Forecasting the Automobile and Parts Product Export Values using Time Series Analysis	Jakkaphan Whasphuttisit and Watchareewan Jitsakul (King Mongkut's University of Technology North Bangkok, Thailand)
13:35	13:50	Circle Detection System using Image Moments	Rifqi Fachruddin and Joko Buliali (Institut Teknologi Sepuluh Nopember, Indonesia)
13:50	14:05	Betta Fish Image Classification Using Artificial Neural Networks With Gabor Extraction Features	Satria Hidayat (Universitas Widyagama, Indonesia); Aviv Yuniar Rahman (Universitas Widyagama Malang, Indonesia); I Istiadi (Widyagama University of Malang, Indonesia)
14:05	14:20	Design and Development of Maturity Identifier of Sugarcane thru Phenomics via Image Processing	Alnie Aderes, Harold Combalicer, Jose Rico Garcia, Alyssa Miranda, Hannah Nicole Pedrosa, Arjay Yabut, Rommel Anacan and Josephine Bagay (Technological Institute of the Philippines-Manila, Philippines)
14:20	14:35	Estimating Rice Production using Machine Learning Models on Multitemporal	Arie Wahyu Wijayanto and Salwa Rizqina Putri (Politeknik Statistika STIS, Indonesia)

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		Landsat-8 Satellite Images	
14:35	14:50	Image Classification of Starlings Using Artificial Neural Network and Decision Tree	Aviv Yuniar Rahman (Universitas Widyagama Malang, Indonesia)
14:50	15:05	Correlation of Expansive Soil and Road Pavement Conditions Using Data Mining from GIS Portal	Aji Suraji (University of Widyagama Malang, Indonesia); Faqih Rofii (Universitas Widyagama Malang, Indonesia); Fitri Marisa (Widyagama University of Malang, Indonesia); Agus Tugas Sudjianto (University of Widyagama, Indonesia); Candra Aditya (Universitas Widyagama Malang, Indonesia); Riman Riman (University of Widyagama, Indonesia)
15:05	15:20	Investigating the Key Factors on XYZ Generations' Higher-Order Thinking Skills in ELearning	Erwin Halim (Bina Nusantara University & School of Information Systems, Indonesia); Kevin Kevin (Bina Nusantara University, Indonesia); Marylise Hebrard (Institut Des Usages, France)
15:20	15:35	E-government Public Complaints Text Classification Using Particle Swarm Optimization	Taqwa Hariguna, Sarmini and Andhika Rafi Hananto (Universitas Amikom Purwokerto, Indonesia)

AIT-0612: Technical Session Artificial Intelligence
Parallel Session 2 (Room 5)
Thursday, June 16th 2022
(13:05 – 15:20)

Start	Finish	Papers	Authors
13:20	13:35	Design and Implementation of IoT-Based Aeroponic Farming System	Riswandi Riswandi (Hasanuddin University, Indonesia); Muhammad Niswar (Universitas Hasanuddin, Indonesia); Zulkifli Tahir (Hasanuddin University, Indonesia); Yung-Wey Chong (Universiti Sains Malaysia, Malaysia)
13:35	13:50	1D-Convnet Model for Detection of Antidepressant Drugs	Gracia Rizka Pasfica, Nur Ghaniaviyanto Ramadhan and Faisal Dharma Adhinata (Institut Teknologi Telkom Purwokerto, Indonesia)
13:50	14:05	Hybrid Whale Optimization Algorithm for Solving Timetabling Problems of ITC 2019	I Gusti Agung Premananda (Institut Teknologi Sepuluh Nopember, Indonesia); Aris Tjahyanto (Sepuluh Nopember Institute of Technology, Indonesia); Ahmad Muklason (Institut Teknologi Sepuluh Nopember, Indonesia)
14:05	14:20	Performance of Information Gain and PCA Feature Selection for Determining Ripen Susu Banana Fruits	Candra Dewi, Endang Arisoesilaningih, Wayan Firdaus Mahmudy and Solimun Solimun (Universitas Brawijaya, Indonesia)
14:20	14:35	Detector Face Mask using UAV-based CNN Transfer Learning of YOLOv5	Rizqi Alinra, Satryo Utomo, Khairul Anam and Gamma Aditya Rahardi (University of Jember, Indonesia)

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14:35	14:50	Machine Learning Algorithms and Datasets for Modern IDS Design	Inam Abdullah Abdulmajeed (University of Kirkuk & College of Computer Science and Information Technology, Iraq)
14:50	15:05	A Hybrid DEMATEL-EDAS Based on Multi-Criteria Decision-Making for A Social Aid Distribution Problem	Irvanizam Irvanizam, Mega Siraturahmi, Aisyah Irwansyah and Puti Nasir (Universitas Syiah Kuala, Indonesia); Zulfan Zulfan (Syiah Kuala University, Indonesia); Nany Salwa (Universitas Syiah Kuala, Indonesia)
15:05	15:20	-	-

**AIT-1319: Technical Session Artificial Intelligence
Parallel Session 3 (Room 1)
Friday, June 17th 2022
(08:45 – 10:45)**

Start	Finish	Papers	Authors
9:00	9:15	Power Allocation Based LSTM-FCN in D2D Underlaying with Multi-Cell Cellular Network	Astri Wulandari and Arfianto Fahmi (Telkom University, Indonesia); Nachwan Mufti Adriansyah (Universitas Telkom, Indonesia)
9:15	9:30	Modified CNN to Maximize Energy Efficiency in D2D Underlying with Multi-Cell Cellular Network	Bayu Setho KusumaSakti and Arfianto Fahmi (Telkom University, Indonesia); Nachwan Mufti Adriansyah (Universitas Telkom, Indonesia); Vinsensius Sigit Widhi Prabowo (Telkom University, Indonesia)
9:30	9:45	Skeletal-based Classification for Human Activity Recognition	Agung Suhendar and Tri Ayuningsih (Telkom Indonesia, Indonesia); Suyanto Suyanto (Telkom University, Indonesia)
9:45	10:00	Voice-Zikr: A Speech Recognition System Implementation for Hands-Free Zikr Based on Deep Learning	Alim Misbullah, Laina Farsiah, Nazaruddin Nazaruddin and Furqan Hermawan (Universitas Syiah Kuala, Indonesia)
10:00	10:15	A study of machine translation for Vietnamese and Korean on the TED Talks 2020 corpus	Binh Van Duong, Kim Chi T. Phan, Chien Nhu Ha and Phat Cao Tran (University of Information Technology, Ho Chi Minh City, Vietnam); Trong-Hop Do (University of Information Technology, Ho Chi Minh City & Vietnam National University, Ho Chi Minh City, Vietnam)
10:15	10:30	Traditional Javanese Membranophone Percussion Play Formalization for Virtual Orchestra Automation	Arry Maulana Syarif and Khafiizh Hastuti (Universitas Dian Nuswantoro, Indonesia); Pulung Nurtantio Andono (Dian Nuswantoro, Indonesia)
10:30	10:45	Hybrid SVD-ARIMA Method for Sales Forecasting with Sparse Data on E-Commerce Products	Vania Putri Minarso (Gadjah Mada University, Indonesia); Teguh Bharata Adji and Noor Akhmad Setiawan (Universitas Gadjah Mada, Indonesia)

AIT-2026: Technical Session Artificial Intelligence
Parallel Session 3 (Room 2)
Friday, June 17th 2022
(08:45 – 10:45)

Start	Finish	Papers	Authors
9:00	9:15	Comparison Of Texture Feature Extraction Method For Covid-19 Detection With Deep Learning	Dionisius Adianto Tirta Nugraha (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)
9:15	9:30	Capitalization Feature and Learning Rate for Improving NER Based on RNN BiLSTMCRF	Warto Warto (Universitas Islam Negeri Profesor Kiai Haji Saifuddin Zuhri, Indonesia); Muljono Muljono (Dian Nuswantoro University, Indonesia); Purwanto Purwanto (Universitas Dian Nuswantoro, Indonesia); Edi Noersasongko (Faculty of Computer Science, Universitas Dian Nuswantoro, Indonesia)
9:30	9:45	Multi-task Solution for Aspect Category Sentiment Analysis on Vietnamese Datasets	Hoang-Quan Dang and Duc-Duy-Anh Nguyen (University of Information Technology, Ho Chi Minh City, Vietnam); Trong-Hop Do (University of Information Technology, Ho Chi Minh City & Vietnam National University, Ho Chi Minh City, Vietnam)
9:45	10:00	Indonesian Automatic Speech Recognition Based on End-to-end Deep Learning Model	Anis Sirwan (Telkom Corporate University, Telkom Indonesia, Indonesia); Kurniawan Thama (PT Telkom Indonesia, Indonesia); Suyanto Suyanto (Telkom University, Indonesia)
10:00	10:15	Review of Feature Extraction on Video-Oculography (VOG) and Electro-Oculography (EOG) Signals	Iqbal Kurniawan Asmar Putra (Gadjah Mada University, Indonesia); Sunu Wibirama and Syukron Abu Ishaq Alfarozi (Universitas Gadjah Mada, Indonesia); Muhammad Ainul Fikri (Gadjah Mada University, Indonesia)
10:15	10:30	Comparison of Support Vector Machine and Neural Network Algorithm in Drone Detection System	Risa Farrid Christianti, Hanin Fuadi and Mas Aly Afandi (Institut Teknologi Telkom Purwokerto, Indonesia); Azhari Azhari (UGM, Indonesia); Andi Dharmawan (Universitas Gadjah Mada, Indonesia)
10:30	10:45	Analysis of DNA Sequence Classification Using SVM Model with Hyperparameter Tuning Grid Search CV	Iis Setiawan Mangkunegara and Purwono Purwono (Universitas Harapan Bangsa, Indonesia)

AIT-2733: Technical Session Artificial Intelligence
Parallel Session 3 (Room 3)
Friday, June 17th 2022
(08:45 – 10:45)

Start	Finish	Papers	Authors
9:00	9:15	Design Science Research Methodology and Its	I Gusti Agung Premananda (Institut Teknologi Sepuluh Nopember, Indonesia); Aris

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		Application to Developing a New Timetabling Algorithm	Tjahyanto (Sepuluh Nopember Institute of Technology, Indonesia); Ahmad Muklason (Institut Teknologi Sepuluh Nopember, Indonesia)
9:15	9:30	Fuzzy Logic Control Strategy for Axial Flux Permanent Magnet Synchronous Generator in WHM 1.5KW	Demas Yangindrajat (Institut Teknologi Sepuluh Nopember & ITS, Indonesia); Harus Guntur (ITS, Indonesia)
9:30	9:45	An Ensemble Voting Method of Pre-Trained Deep Learning Models for Skin Disease Identification	Kien Trang and An Hoang Nguyen (International University, Vietnam); Long TonThat (International University HCMC, Vietnam); Hung Ngoc Do (International University, Vietnam); Bao Quoc Vuong (University of Brest, France & International University, VNUHCM, Vietnam)
9:45	10:00	Expert System Integrated with Medical Record for Infectious Diseases using Certainty Factor	I Istiadi and Emma Sulistiarini (Widyagama University of Malang, Indonesia); Rudy Joegijantoro (Widyagama Husada School of Health, Indonesia); Kuncahyo Setyo Nugroho (Brawijaya University, Indonesia); Ismail Akbar (State Islamic University Maulana Malik Ibrahim, Indonesia); Affi Nizar Suksmawati (Gadjah Mada University, Indonesia)
10:00	10:15	COVID-19 Disease Classification by Cough Records Analysis using Machine Learning	Kien Trang and An Hoang Nguyen (International University, Vietnam); Long TonThat (International University HCMC, Vietnam); Hung Ngoc Do (International University, Vietnam); Bao Quoc Vuong (University of Brest, France & International University, VNUHCM, Vietnam)
10:15	10:30	Epileptic Seizure Detection Using Machine Learning and Deep Learning Method	Ade Eviyanti (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia); Ahmad Saikhu and Chastine Fatichah (Institut Teknologi Sepuluh Nopember, Indonesia)
10:30	10:45	USK-COFFEE Dataset: A Multi-class Green Arabica Coffee Bean Dataset for Deep Learning	Alifya Febriana (University of Syiah Kuala, Indonesia); Kahlil Muchtar and Rahmad Dawood (Universitas Syiah Kuala, Indonesia); Chih-Yang Lin (Yuan Ze University, Taiwan)

AIT-3444: Technical Session Artificial Intelligence
Parallel Session 3 (Room 4)
Friday, June 17th 2022
(08:45 – 10:45)

Start	Finish	Papers	Authors
9:00	9:15	Classifying The Swallow Nest Quality Using Support Vector Machine Based on Computer Vision	Anindita Septiarini and Hamdani Hamdani (Universitas Mulawarman, Indonesia); Tenia Wahyuningrum (Institut Teknologi Telkom Purwokerto, Indonesia)
9:15	9:30	Hyperparameter Optimization on CNN Using Hyperband on	Ardiansyah K Alkaff and Budi Prasetyo (Universitas Negeri Semarang, Indonesia)

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		Tomato Leaf Disease Classification	
9:30	9:45	Intrusion Detection using Dense Neural Network in Network System	Aman Doherey and Akansha Singh (Centre for Advanced Studies, Lucknow, India); Arun Kumar (Centre for Advanced Studies Lucknow, India)
9:45	10:00	Cataract Detection using Deep Learning Model on Digital Camera Images	Raghavendra Ramkewal Chaudhary (Centre for Advanced Studies, Lucknow, India); Arun Kumar (Centre for Advanced Studies Lucknow, India)
10:00	10:15	On-tree Mature Coconut Fruit Detection based on Deep Learning using UAV images	Jilbert M Novelerio and Jennifer C. Dela Cruz (Mapua University, Philippines)
10:15	10:30	Credit card fraud detection system using machine learning technique	Ayushi Maurya (CENTRE FOR ADVANCED STUDIES, Lucknow, India); Arun Kumar (Centre for Advanced Studies Lucknow, India)
10:30	10:45	Aspect-based Sentiment Analysis for Improving Online Learning Program based on Student Feedback	Yaya Heryadi, Bambang Wijanarko and Dina Fitria Murad, Dfm (Bina Nusantara University, Indonesia); Cuk Tho (University of Bina Nusantara, Indonesia); Kiyota Hashimoto (Prince of Songkhla University, Thailand)

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1D-Convnet Model for Detection of Antidepressant Drugs

Gracia Rizka Pasfica
Department of Software Engineering
Institut Teknologi Telkom Purwokerto
Purwokerto, Indonesia
19104064@ittelkom-pwt.ac.id

Nur Ghaniaviyanto Ramadhan*
Department of Software Engineering
Institut Teknologi Telkom Purwokerto
Purwokerto, Indonesia
ghani@ittelkom-pwt.ac.id

Faisal Dharma Adhinata
Department of Software Engineering
Institut Teknologi Telkom Purwokerto
Purwokerto, Indonesia
faisal@ittelkom-pwt.ac.id

Abstract—A drug is a substance or mixture of materials to be used in determining the diagnosis, preventing, reducing, eliminating, curing disease or symptoms of disease, bodily or spiritual injury or disorder in humans or animals, including to beautify the body or parts of the human body. Problems begin to arise when a patient is wrong in consuming the target drug used, which is not by the type of disease suffered. For example, suppose a person suffers from a psychological disorder that requires taking different types of drugs, if it turns out that the type of drug consumed is not by the disease, it is very dangerous. This problem is certainly very dangerous because it can cause death for those who consume it. Currently, many researchers are using the deep learning Convolutional Neural Network (CNN) model for drug detection problems. The CNN model has a higher level, namely 1D-Convolutional Neural Network (1D-Convnet) which is still rarely used for drug detection problems. So, the purpose of this study was to detect the classification of atypical antidepressants and SSRIs antidepressants using a deep learning model of the 1D-Convolutional Network (1D-Convnet) type. The results obtained using this model are 98.3% with the most influential parameter, namely dropout. The proposed research model also produces higher accuracy than the Naive Bayes supervised learning model.

Keywords—1D-Convnet, Antidepressant, Drugs, Deep Learning

I. INTRODUCTION

A drug is a substance or mixture of materials to be utilized in deciding the determination, anticipating, lessening, killing, curing infection or indications of illness, damage, or physical or otherworldly clutter in people or creatures, counting to decorate the body or parts of the human body. [1]. Drugs also have several types, including generic drugs, patent drugs, and branded generic drugs [1]. Problems begin to arise when a patient is wrong in consuming the target drug used, which is not in accordance with the type of disease suffered. For example, suppose a person suffers from a psychological disorder that requires taking different types of drugs, if it turns out that the type of drug consumed is not in accordance with the disease, it is very dangerous. This problem is certainly very dangerous because it can cause death for those who consume it. Of course, these problems can be overcome by applying intelligent learning techniques based on machine algorithms to determine what drugs should be used.

Several studies related to determining the target drug users have been carried out by other researchers, such as in predicting the problem of drug-target interactions using the KronRLS-MKL model [2]. In another study discussing the prediction of drug-target interactions, a problem was to identify new protein-ligand interactions from previous information based on deep learning [3]. The authors created

DDR, a modern strategy that makes strides DTI expectation precision. DDR is based on the utilize of heterogeneous charts containing known DTIs with numerous similitudes between drugs and a few similitudes between target proteins [4].

Another study discussed the prediction of drug-target interactions and food-drug constituent interactions with a deep learning approach which resulted in an accuracy of 92% [5]. The same problem is using the Artificial Neural Network (ANN) model [6]. Other analysts proposed the Bayesian Positioning Forecast of Drug-Target Intelligent (BRDTI). This strategy is based on the Bayesian Personalized Positioning (BPR) network factorization which has demonstrated to be a great approach for different inclination learning [7]. This model has never been used for DTI prediction before [7].

Other studies predict new interactions that have not been discovered with other problems to be addressed, namely class imbalance which has the potential to reduce predictive performance [8]. Another study focused on predicting interactions between drugs and targets by playing a role in drug discovery [9]. Another study aims to focus on a machine learning approach and provide a comprehensive understanding of the prediction of drug-target interactions [10].

Other studies discuss several machine learning methods such as support vector machines, decision trees, naive Bayesian, KNN, and ANN which are used to predict drug-target interactions [11]. Another paper proposed an algorithm for predicting drug-target interactions called regulated logistic matrix factorization (NRLMF) [12]. Another study described the prediction of target drug interactions using the maximum coverage approach [13]. Related studies also predict drug-target interactions by presenting the SimBoost method which functions for continuous (non-binary) prediction [14]. In a study studying the BI-LSTM model in a problem predicting interactions between drugs used [15].

In another study discussing drug sentiment analysis which has become very significant in today's classification of drugs based on their effectiveness, the analysis was carried out through user reviews which can help potential future consumers in gaining knowledge and making better decisions about certain drugs [16]. Another author developed a High Alert Drugs (HAD) screening protocol with a machine learning model using the Gradient Boosting Classifier and screening parameters to identify the incidence of High Alert Drugs (HAD) prescribing errors from outpatient and inpatient drug prescriptions at Maharaj Nakhon Chiang Mai Hospital in 2018 [17].

So, this study aims to detect the classification of Atypical antidepressant drugs and antidepressant SSRIs using the deep learning 1D Convolutional Neural Network (1D Convnet) algorithm.

II. RESEARCH METHOD

Figure 1 is the flow of this research process.

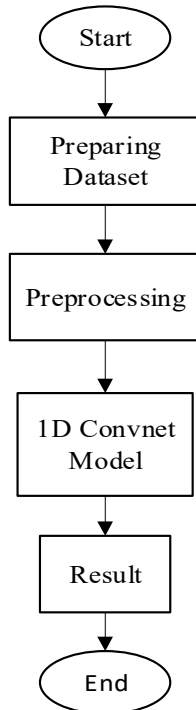


Fig. 1 Design Process

A. Dataset

In this study, data were collected through the National Library of Medicine [18]. The types of drugs used are for the category of atypical antidepressants and SSRIs as many as 502 kinds of drugs with different doses. Atypical is a treatment for major depressive disorder, while SSRIs are a treatment for depression by increasing serotonin levels in the brain.

B. Preprocessing

In this process, the dataset is separated into training and testing. Then the dataset will be converted into lowercase form and remove irrelevant symbols such as (, " ? ! *). Table 1 is an example of the results obtained after the preprocessing process is complete. In this preprocessing, stemming and tokenization processes are carried out. The goal of this preprocessing is that the dataset which was previously in the form of many sentences is converted into a vector-matrix form that functions for detection using the 1D-Convnet model.

TABLE I. PREPROCESSING RESULT

Drugs Name	Category
[trazodone, hydrochloride]	Atypical
[amfebutamone, bupropion, hcl]	Atypical
[bupropion, hcl]	Atypical

Drugs Name	Category
[amfebutamone, hydrochloride]	Atypical
[citalopram, hydrobromide]	SSRIs
[paroxetine]	SSRIs
[sertraline]	SSRIs
[fluoxetine, succinamic, acid]	SSRIs

C. 1D-Convnet Model

After the dataset has been preprocessed, the next step is to implement the 1D Convolutional Neural Network (1D-Convnet) model using several parameters. The 1D-Convnet model is a derivative of the Convolutional Network model. This network is one of the deep learning models which can handle long and varied input sequences [19]. In this model, there is a network that inserts a one-dimensional convolution layer and a dynamic k-max-pooling layer. The convolution layer applies a one-dimensional filter in each feature row in the sentence matrix [19].

Step 1D-Convnet comprises of 1D convolution layer, Batch Normalization, and pooling layer [20]. Figure 2 shows up the concept of 1D convolution layer and max-pooling layer. The layer degree of the convolution layer is set to 32, and 128 layers are utilized in include up to. Hence, 128 yields each containing 97 $128-32+1$ components are delivered when a single outline spectrogram (128 container frequencies) is nourished into a 1D convolution layer. Following, a ReLU (Rectified Linear Unit) activation work is connected [21]. Hence, a max-polling of measure 97 is connected to each yield which may be a agent esteem. Dropout is additionally connected with a esteem of 0.5 at the conclusion of Convnet to maintain a strategic distance from overfitting.

The 1D Convolutional Network model, has several common layers, such as fully connected, max pooling, and convolutional. This study uses a combination of the three layers. Figure 3 is the layer on 1D-Convnet.

A convolutional layer is a layer that performs spatial convolution between input and filter. The filter contains the weights which are the components of the layer being considered. Max surveying could be a layer that takes input tests to create yield with littler measurements by selecting the most extreme esteem component. Completely associated is the layer that interfaces the yield of the volume layer to the ultimate yield. They permit meeting of choices at higher levels. [22].

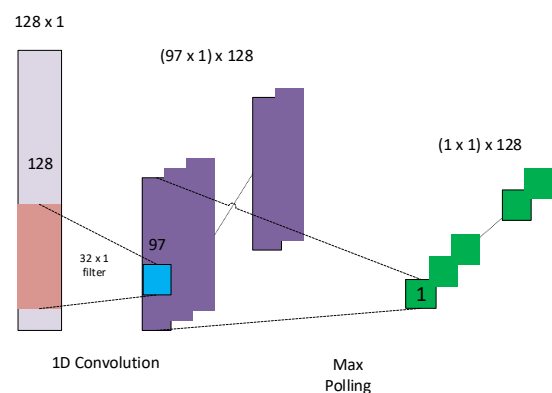


Fig. 2 1D-Convnet Structure for frame feature extraction [19]

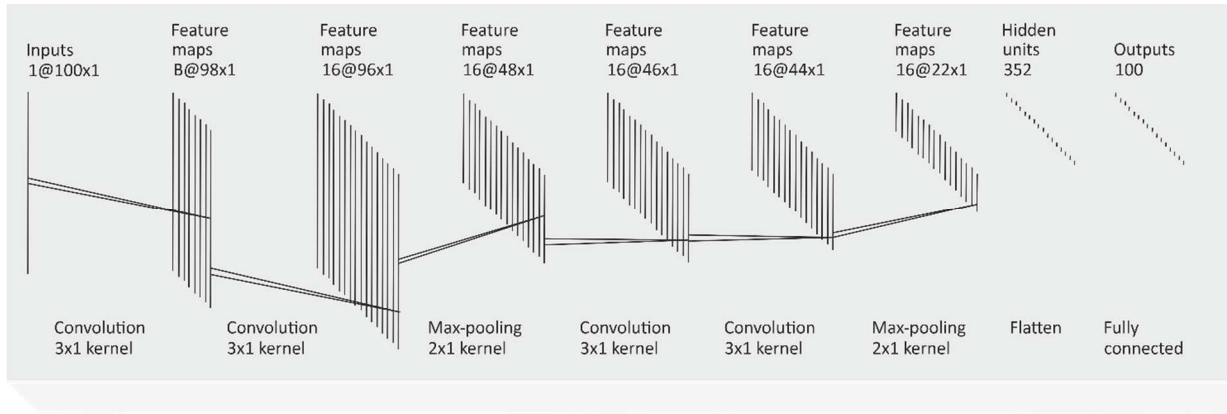


Fig. 3 1D-Convnet: Each 1D-Convnet block consists of 4 convolution layers, 2 max-pooling layers, and 1 fully connected layer

The output value of the 1D-Convnet layer with the input (N, Cin, L) and output $(N, Cout, Lout)$ sizes in formula (1) [23].

$$out(N_i, Cout_j) = bias(Cout_j) + \sum_{k=0}^{Cin-1} weight(Cout_j, k) * input(N_i, k) \quad (1)$$

Where N_i is the size of batch I , $Cout_j$ is the j th channel, L is the length of the signal sequence (if the input is an image, width and tallness ought to be utilized rather than length). At that point the length of the yield flag arrangement can be calculated utilizing equation (2) [23].

$$L_{out} = \frac{L_{in} + 2 \times padding - dilation \times (kernelsize - 1) - 1}{stride} + 1 \quad (2)$$

Where strides is a cross-correlation step. Padding is the number of zero padding on both sides. Dilation is the distance between kernel elements. Kernel size is the convolution size of the kernel. For max-pooling 1D, the output value with size input (N, C, L) and output $(N, C, Lout)$ can be seen in formula (3) [23].

$$out(N_i, Cout_j) = \max_{m=0, \dots, kernel\ size-1} input(N_i, C_j, stride \times k + m) \quad (3)$$

Where N_i is the I -th input, C_j is the j th channel. kernel size is the window size to take max. Stride is a step from the window. Padding is the number of zeros to be added on both sides. Dilation is a parameter that controls the step of an element in the window.

D. Naïve Bayes

Naive Bayes is a simple technique for constructing classifiers: a model that assigns class labels to problem instances, represented as feature value vectors, where class labels are drawn from some finite set [24]. Naïve Bayes is

also a model that is often used for text classification problems [24].

In formula (4) is a formula for calculating Naive Bayes.

$$P(Y_j|X_i) = \frac{P(X_i|Y_j) P(Y_j)}{P(X_i)} \quad (4)$$

Where $P(Y_j|X_i)$ is the posterior probability to be searched. $P(X_i|Y_j)$ is the likelihood, $P(Y_j)$ is the prior probability class and $P(X_i)$ is the prior probability predictor.

E. Detection

In this detection process using the 1D-Convnet model with the dataset first separated between training and testing. To measure the value of this process using the calculation of accuracy and loss function. The accuracy formula can be seen in formula (5), while the loss function formula can be seen in formula (6) [25].

$$Accuracy = \frac{TP+TN}{TP+TN+FP+FN} \quad (5)$$

$$Loss(p, q) = \frac{1}{|M|} \sum_{i=1}^{i=M} -q_i \log p_i \quad (6)$$

Where Magnetization is the data points where q_i is the correct value between 0 or 1, while p_i is the SoftMax probability. TP is true positive, TN is true negative, FP is false positive, FN is false negative.

III. RESULT AND DISCUSSION

The best results were obtained through several experiments by changing the parameters on the 1D-Convnet model such as max feature, embedding dimensions, sequence length, dropout value, and epoch. So that the results obtained look like in Table II.

TABLE II. RESULT

Max Feature	Embedding Dimension	Length	Dropout	Epoch	Accuracy %	Loss
20000	128	500	0.5	8	95	0.4
5000	100	250	0.3	100	98.3	0.1
30000	200	700	0.7	100	96.6	0.3
5000	200	700	0.7	100	96.6	0.3
30000	100	250	0.3	100	96.6	0.3
5000	100	250	0.3	8	98.3	0.1

It can be seen from the results of Table II above that the highest accuracy is 98.3%. After experimenting by changing the parameters on the 1D-Convnet model, the most influential parameters are dropout and epoch. If the dropout value is below 0.5, the resulting accuracy is stable at an average of 97.6%, which means that the figure is higher when used generally. Conversely, if the dropout value is above 0.5, the resulting accuracy is stable at an average of 96%. The epoch parameter does not have a significant effect because when the epoch is worth 8 and the dropout value is 0.3, the resulting accuracy is very high.

In addition to the accuracy value, this study also uses measurements in the form of loss values, which if the loss value is getting smaller, indicates that the model used is very good at predicting a problem. In Table II, the smallest loss value is 0.1, where the accuracy is 98.3%. This indicates that the selection of parameter values and the model used is correct.

In Figure 4 and Figure 5 is a form of visualization of the name of the drug used based on the Atypical category and SSRIs.

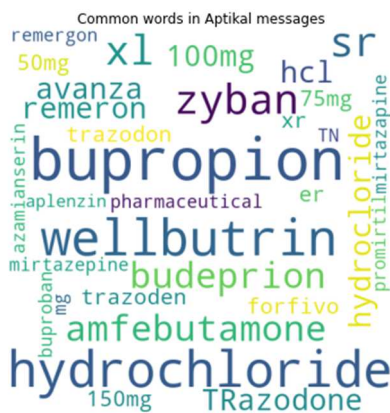


Fig. 4 Antidepressant Atypical

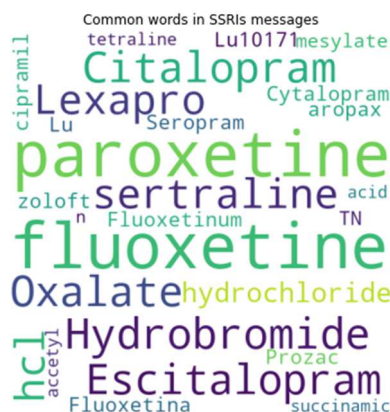


Fig. 5 Antidepressant SSRIs

Meanwhile, Figure 6 is the distribution of the number of words based on density. It can be seen from the density results that the SSRIs class has more density and more than 1.

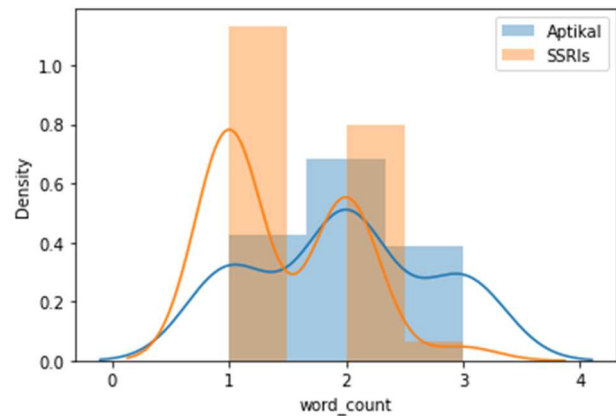


Fig. 6 Word Count Density

Figure 7 is the result of a comparison of the 1D-Convnet model using the Naive Bayes model.

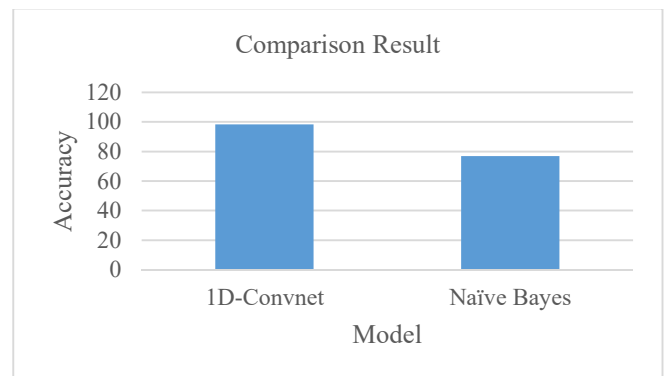


Fig. 7 Comparison Result

Seen from Figure 7 that the proposed research model has higher accuracy results than supervised learning models such as Naive Bayes. The results of the difference in accuracy can reach 21%. Judging from the value of the difference in accuracy is so large, of course in the selection of learning models for the detection of drugs used must be done properly.

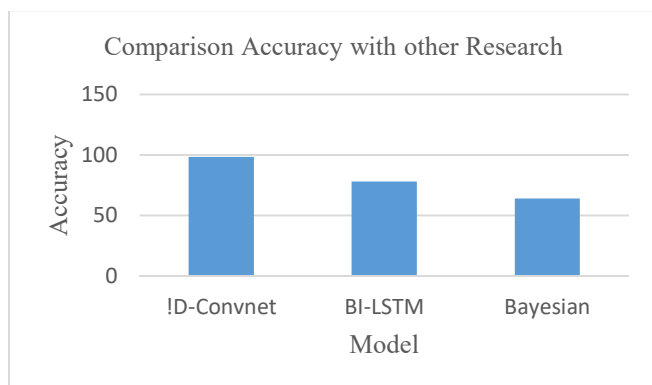


Fig. 8 Comparison with Other Research

Figure 8 is a comparison with other models in previous studies. The results obtained for the proposed research model are still far superior to about 20% compared to other models.

The results also show that the model using the deep learning approach results in accuracy for text classification problems much better than the unsupervised learning model.

IV. CONCLUSION

Conclusion in this study include, the 1D-Convnet model was successful in detecting classifications related to the category of Atypical antidepressants and SSRIs. Parameters in the 1D-Convnet model have an influence on the accuracy results. The most influential parameter is the dropout value. The highest accuracy produced is 98.3% with a dropout value of 0.3. The 1D-Convnet deep learning model also produces higher accuracy than the supervised learning Naive Bayes model with a difference of 21%.

ACKNOWLEDGMENT

Thank you for Telkom Purwokerto Institute of Technology funding this research.

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