

BAB V

SIMPULAN DAN SARAN

5.1 Simpulan

Berdasarkan hasil yang telah dipaparkan dapat disimpulkan beberapa poin sebagai berikut:

- a. Model *Densenet169* dengan *dataset background* adalah model yang mendapatkan akurasi tertinggi mencapai 88.33% dengan presisi, *recall* dan f-1 score masing-masing mencapai 86.34%, 87.38% dan 86.78%.
- b. Keberadaan *background* pada *dataset* mendukung model dalam memberikan konteks tambahan yang meningkatkan akurasi identifikasi sampah secara signifikan.
- c. Aplikasi web yang dibangun dapat mengidentifikasi jenis sampah, memberikan informasi akurasi serta panduan daur ulang.

5.2 Saran

Berdasarkan pembahasan yang telah dipaparkan terdapat beberapa saran yang dapat diterapkan untuk penelitian selanjutnya yaitu:

- a. Membutuhkan penelitian lebih lanjut untuk mengintegrasikan model yang telah dikembangkan dengan perangkat Internet of Things (IoT).
- b. Memperluas *dataset* dan menambah kategori untuk meningkatkan pemahaman terhadap variasi data, serta mendukung pembelajaran model yang lebih efektif.
- c. Melakukan eksperimen dengan teknik-teknik baru dalam pengembangan model klasifikasi sampah untuk memperbaiki kinerja model dan mengatasi keterbatasan yang ada.

DAFTAR PUSTAKA

- Adedeji, O., & Wang, Z. (2019). Intelligent waste classification system using *deep learning* CNN. *Procedia Manufacturing*, 35, 607–612. <https://doi.org/10.1016/j.promfg.2019.05.086>
- Ahmed, M. I. B., Alotaibi, R. B., Al-Qahtani, R. A., Al-Qahtani, R. S., Al-Hetela, S. S., Al-Matar, K. A., Al-Saqer, N. K., Rahman, A., Saraireh, L., Youldash, M., & Krishnasamy, G. (2023). *Deep learning* Approach to Recyclable Products Classification: Towards Sustainable Waste Management. *Sustainability (Switzerland)*, 15(14). <https://doi.org/10.3390/su151411138>
- Aljundi, R., Kelchtermans, K., & Tuytelaars, T. (2019). Task-free continual learning. *Proceedings of the IEEE Computer Society Conference on Computer vision and Pattern Recognition, 2019-June*, 11246–11255. <https://doi.org/10.1109/CVPR.2019.01151>
- Al-rimy, B. A. S., Saeed, F., Al-Sarem, M., Albarrak, A. M., & Qasem, S. N. (2023). An Adaptive Early Stopping Technique for *Densenet169*-Based Knee Osteoarthritis Detection Model. *Diagnostics*, 13(11). <https://doi.org/10.3390/diagnostics13111903>
- Alzubaidi, L., Bai, J., Al-Sabaawi, A., Santamaría, J., Albahri, A. S., Al-dabbagh, B. S. N., Fadhel, M. A., Manoufali, M., Zhang, J., Al-Timemy, A. H., Duan, Y., Abdullah, A., Farhan, L., Lu, Y., Gupta, A., Albu, F., Abbosh, A., & Gu, Y. (2023). A survey on *deep learning* tools dealing with data scarcity: definitions, challenges, solutions, tips, and applications. *Journal of Big Data*, 10(1). <https://doi.org/10.1186/s40537-023-00727-2>
- Alzubaidi, L., Zhang, J., Humaidi, A. J., Al-Dujaili, A., Duan, Y., Al-Shamma, O., Santamaría, J., Fadhel, M. A., Al-Amidie, M., & Farhan, L. (2021). Review of *deep learning*: concepts, CNN architectures, challenges, applications, future directions. *Journal of Big Data*, 8(1). <https://doi.org/10.1186/s40537-021-00444-8>
- Awasthi, P., Chataut, G., & Khatri, R. (2023). Solid waste composition and its management: A case study of Kirtipur Municipality-10. *Heliyon*, 9(11). <https://doi.org/10.1016/j.heliyon.2023.e21360>
- Bezdan, T., & Baćanin Džakula, N. (2019). CNN Layers and Architectures. *Sinteza 2019 - International Scientific Conference on Information Technology and Data Related Research*, 445–451. <https://doi.org/10.15308/sinteza-2019-445-451>
- Bobulski, J., & Kubanek, M. (2021). *Deep learning* for Plastic Waste Classification System. *Applied Computational Intelligence and Soft Computing*, 2021. <https://doi.org/10.1155/2021/6626948>
- Brown, J., Gharineiat, Z., & Raj, N. (2023). CNN Based *Image* Classification of Malicious UAVs. *Applied Sciences (Switzerland)*, 13(1). <https://doi.org/10.3390/app13010240>
- Casabona, J. (2020). *HTML and CSS: Visual QuickStart Guide*. Peachpit Press.
- Chauhan, T., Palivela, H., & Tiwari, S. (2021). Optimization and fine-tuning of DenseNet model for classification of COVID-19 cases in medical imaging. *International Journal of Information Management Data Insights*, 1(2). <https://doi.org/10.1016/j.jjime.2021.100020>

- Chazanah, I. N., Bayu, A., & Nandiyanto, D. (2022). Literature of Waste Management (Sorting of Organic and Inorganic Waste) Through Digital Media in Community. In *International Journal of Research and Applied Technology* (Vol. 2, Issue 1).
- Chen, H. (2021). Optimization of an Intelligent Sorting and Recycling System for Solid Waste Based on *Image* Recognition Technology. *Advances in Mathematical Physics*, 2021. <https://doi.org/10.1155/2021/4094684>
- Chen, L., Li, S., Bai, Q., Yang, J., Jiang, S., & Miao, Y. (2021). Review of *image* classification algorithms based on CNNs. In *Remote Sensing* (Vol. 13, Issue 22). MDPI. <https://doi.org/10.3390/rs13224712>
- Dalle, J., A, A., & B. (2020). *Pengantar Teknologi Informasi*. PT RajaGrafindo Persada.
- Fadlil, A., Umar, R., Sunardi, & Nugroho, A. S. (2022). Comparison of *Machine learning* Approach for Waste Bottle Classification. *Emerging Science Journal*, 6(5), 1075–1085. <https://doi.org/10.28991/ESJ-2022-06-05-011>
- Fahmy, M. M. (2022). *Confusion matrix* in Binary Classification Problems: A Step-by-Step Tutorial. In *Journal of Engineering Research* (Vol. 6, Issue 5). ERJ.
- Fang, W., Love, P. E. D., Luo, H., & Ding, L. (2020). *Computer vision* for behaviour-based safety in construction: A review and future directions. In *Advanced Engineering Informatics* (Vol. 43). Elsevier Ltd. <https://doi.org/10.1016/j.aei.2019.100980>
- Filter, J. (2022). *Split-folders 0.5.1*. Python Package Index.
- Géron, A. (2022). *Hands-on machine learning with Scikit-learn, Keras, and Tensorflow*. O'Reilly Media, Inc.
- Golian, N., Golian, V., & Afanasieva, I. (2022). BLACK AND WHITE-BOX UNIT TESTING FOR WEB APPLICATIONS. *Bulletin of National Technical University "KhPI". Series: System Analysis, Control and Information Technologies*, 1 (7), 79–83. <https://doi.org/10.20998/2079-0023.2022.01.13>
- Grandini, M., Bagli, E., & Visani, G. (2020). *Metrics for Multi-Class Classification: an Overview*. <http://arxiv.org/abs/2008.05756>
- Gunadi, F., & Widiyanto, S. R. (2020). Perbandingan Data Warehouse Cloud Computing Menggunakan Konvensional Berbasis Kriptografi. *Seminar Nasional Teknologi Komputer & Sains (SAINTEKS)*, 69–73.
- Hamami, F. (2023). *Garbage classification using CNN based transfer learning*. 020012. <https://doi.org/10.1063/5.0128946>
- Hanifah, A. I., & Hermawan, A. (2023). Klasifikasi Kematangan Pisang Menggunakan Metode CNN. *Komputika: Jurnal Sistem Komputer*, 12(2), 49–56. <https://doi.org/10.34010/komputika.v12i2.9999>
- Harani, N. H., & Hasanah, M. (2020). *Deteksi Objek dan Pengenalan Karakter Plat Nomor Kendaraan Indonesia Berbasis Python*. Kreatif.
- Huzaeni, F., Gunawan, I., Cahya Purnomo, D., Yanti, M., & Krisdayanti abcde Teknik Elektro Sekolah Tinggi Teknologi Ronggolawe Cepu Penulis Korenspondensi, N. (2021). Analisis Keamanan Data Pada Website Dengan Wireshark. In *Jurnal Elektro Smart* (Vol. 1, Issue 1). <http://sttrcepu.ac.id/siakapt/login>

- Imam, H., Fathurrahman, K., Azhari, A., Sutikno, T., Chin, L.-Y., Murdaka Putra, P., Dwian Yunandha, I., Yopa, G., Pratama, R., & Purnomo, B. (2023). Indonesian Waste Database: Smart Mechatronics System. *International Journal of Robotics and Control Systems*, 3(2), 354–363. <https://doi.org/10.31763/ijrcs.v2i1>
- Kaban, R., & Sembiring, D. J. (2021). *HTML (Hypertext Markup Language) pengantar pemrograman berbasis web*. CV. Mitra Cendekia Media.
- Kang, Z., Yang, J., Li, G., & Zhang, Z. (2020). An Automatic Garbage Classification System Based on Deep learning. *IEEE Access*, 8, 140019–140029. <https://doi.org/10.1109/ACCESS.2020.3010496>
- Kapoor, A., Gulli, A., Pal, S., & Chollet, F. (2022). *Deep learning with Tensorflow and Keras: Build and deploy supervised, unsupervised, deep, and reinforcement learning models*. Packt Publishing Ltd.
- Kevin, V., Que, S., Analisis, :, Transportasi, S., Iriani, A., & Purnomo, H. D. (2020). Analisis Sentimen Transportasi Online Menggunakan *Support Vector Machine* Berbasis Particle Swarm Optimization (Online Transportation Sentiment Analysis Using *Support Vector Machine* Based on Particle Swarm Optimization). In *Jurnal Nasional Teknik Elektro dan Teknologi Informasi* | (Vol. 9, Issue 2). www.tripadvisor.com,
- Kurniawan, D. (2022). *Pengenalan Machine learning dengan Python*. Elex Media Komputindo.
- Li, H. C., Deng, Z. Y., & Chiang, H. H. (2020). Lightweight and resource-constrained learning network for face recognition with performance optimization. *Sensors (Switzerland)*, 20(21), 1–20. <https://doi.org/10.3390/s20216114>
- Lin, K., Zhao, Y., Gao, X., Zhang, M., Zhao, C., Peng, L., Zhang, Q., & Zhou, T. (2022). Applying a deep residual network coupling with *transfer learning* for recyclable waste sorting. *Environmental Science and Pollution Research*, 29(60), 91081–91095. <https://doi.org/10.1007/s11356-022-22167-w>
- Lin, K., Zhao, Y., Wang, L., Shi, W., Cui, F., & Zhou, T. (2023). MSWNet: A visual deep *machine learning* method adopting *transfer learning* based upon ResNet 50 for municipal solid waste sorting. *Frontiers of Environmental Science and Engineering*, 17(6). <https://doi.org/10.1007/s11783-023-1677-1>
- Liu, L., Ouyang, W., Wang, X., Fieguth, P., Chen, J., Liu, X., & Pietikäinen, M. (2020). *Deep learning for Generic Object Detection: A Survey*. *International Journal of Computer vision*, 128(2), 261–318. <https://doi.org/10.1007/s11263-019-01247-4>
- Luis F. Diaz, Clarence G. Golueke, George M. Savage, & Linda L. Eggerth. (2020). *Composting and Recycling Municipal Solid Waste*. CRC Press.
- Maarif, A. (2020). *Buku Ajar Pemrograman Lanjut Bahasa Pemrograman Python*.
- Mao, W. L., Chen, W. C., Wang, C. T., & Lin, Y. H. (2021). Recycling waste classification using optimized CNN. *Resources, Conservation and Recycling*, 164. <https://doi.org/10.1016/j.resconrec.2020.105132>
- Mark, N., & Alberto, A. (2019). *Feature Extraction and Image Processing for Computer vision: Edition 4*. Academic Press. <https://books.google.co.id/books?hl=id&lr=&id=KcW-DwAAQBAJ&oi=fnd&pg=PP1&dq=detection+image+processing&ots=11iz3oUE0P>

&sig=3LkyETGz6A6RoairoFOG3beK_qk&redir_esc=y#v=onepage&q=detection%20image%20processing&f=false

- McGrath, M. (2020). *HTML, CSS & JavaScript in easy steps*. In Easy Steps Limited.
- Nahm, F. S. (2022). Receiver operating characteristic curve: overview and practical use for clinicians. *Korean Journal of Anesthesiology*, 75(1), 25–36. <https://doi.org/10.4097/kja.21209>
- Narmadha, R. P., Sengottaiyan, N., & Kavitha, R. J. (2022). Deep transfer learning based rice plant disease detection model. *Intelligent Automation and Soft Computing*, 31(2), 1257–1271. <https://doi.org/10.32604/iasc.2022.020679>
- Nashrullah, F., Wibowo, S. A., & Budiman, D. G. (2020). Investigasi Parameter *Epoch* Pada Arsitektur *ResNet-50* Untuk Klasifikasi Pornografi. *Journal of Computer, Electronic, and Telecommunication*.
- Nugraha, F. A., Harani, N. H., & Habibi, R. (2020). *Analisis Sentimen Terhadap Pembatasan Sosial Menggunakan Deep learning*. Kreatif.
- Orisa, M., & Hidayat, T. (2019). ANALISIS TEKNIK SEGMENTASI PADA PENGOLAHAN CITRA. In *Jurnal MNEMONIC* (Vol. 2, Issue 2).
- Oswald Campesato. (2020). *Artificial Intelligence, Machine learning, and Deep learning*. Mercury Learning and Information LLC. https://books.google.co.id/books?hl=id&lr=&id=pqnNDwAAQBAJ&oi=fnd&pg=PT16&dq=Artificial+Intelligence,+Machine+Learning+and+Deep+Learning.+Dulles:+Mercury+Learning+and+Information+LLC.&ots=I2SxMON0UU&sig=Js5avan1NBgUuzkgWiBDlMrIHl8&redir_esc=y#v=onepage&q=Artificial%20Intelligence%2C%20Machine%20Learning%20and%20Deep%20Learning.%20Dulles%3A%20Mercury%20Learning%20and%20Information%20LLC.&f=false
- Pajankar, A. (2020). Practical *Python* Data Visualization: A Fast Track Approach To Learning Data Visualization With *Python*. In *Practical Python Data Visualization: a Fast Track Approach to Learning Data Visualization with Python*. Apress Media LLC. <https://doi.org/10.1007/978-1-4842-6455-3>
- Palaz, D., Magimai-Doss, M., & Collobert, R. (2019). End-to-end acoustic modeling using CNNs for HMM-based automatic speech recognition. *Speech Communication*, 108, 15–32. <https://doi.org/10.1016/j.specom.2019.01.004>
- Pane, S. F., Zamzam, M., & Fadillah, M. D. (2020). *Membangun Aplikasi Peminjaman Jurnal Menggunakan Aplikasi Oracle Apex Online*. Kreatif.
- Pang, Y., Yu, W., Zhang, Y., Xuan, C., & Wu, P. (2023). Sheep face recognition and classification based on an improved *Mobilenetv2* neural network. *International Journal of Advanced Robotic Systems*, 20(1). <https://doi.org/10.1177/17298806231152969>
- Pardede, A., Sidik, A., Diterbitkan Pertama Kali Oleh, Md., Islam Kalimantan Muhammad Arsyad Al Banjari Jl Adhyaksa No, U., Banjarmasin, K., & Selatan Indonesia, K. (2019). *Desain Cover dan Layout*.
- Pimentel, J. F., Murta, L., Braganholo, V., & Freire, J. (2021). Understanding and improving the quality and reproducibility of *Jupyter Notebooks*. *Empirical Software Engineering*, 26(4). <https://doi.org/10.1007/s10664-021-09961-9>

- Poudel, S., & Poudyal, P. (2022). Classification of Waste Materials using CNN Based on *Transfer learning*. *ACM International Conference Proceeding Series*, 29–33. <https://doi.org/10.1145/3574318.3574345>
- Prayogo, R., Anggraeni, D., & Hadi, A. F. (2022). Classification of Cardiovascular Disease Gene Data Using Discriminant Analysis and *Support Vector Machine* (SVM). *BERKALA SAINSTEK*, 10(3), 124. <https://doi.org/10.19184/bst.v10i3.22259>
- Putri, W. L., & Jarti, N. (2022). *Rancang Bangun Manajemen Akuntansi Berbasis Web Mobile*. CV BATAM PUBLISHER.
- Qin, L. W., Ahmad, M., Ali, I., Mumtaz, R., Zaidi, S. M. H., Alshamrani, S. S., Raza, M. A., & Tahir, M. (2021). Precision Measurement for Industry 4.0 Standards towards Solid Waste Classification through Enhanced Imaging Sensors and *Deep learning* Model. *Wireless Communications and Mobile Computing*, 2021. <https://doi.org/10.1155/2021/9963999>
- Rahadi, N. W., & Vikasari, C. (2020). Pengujian Software Aplikasi Perawatan Barang Milik Negara Menggunakan Metode *Black box Testing* Equivalence Partitions. *Infotekmesin*, 11(1), 57–61. <https://doi.org/10.35970/infotekmesin.v11i1.124>
- Rahmad, F., Suryanto, Y., & Ramli, K. (2020). Performance Comparison of Anti-Spam Technology Using *Confusion matrix* Classification. *IOP Conference Series: Materials Science and Engineering*, 879(1). <https://doi.org/10.1088/1757-899X/879/1/012076>
- Rahutomo, F., Yanuar Risca Pratiwi, I., Mayangsari Ramadhani, D., & Negeri Malang Jalan Soekarno Hatta No, P. (n.d.). *EKSPERIMEN NAÏVE BAYES PADA DETEKSI BERITA HOAX BERBAHASA INDONESIA NAÏVE BAYES'S EXPERIMENT ON HOAX NEWS DETECTION IN INDONESIAN LANGUAGE*.
- Ramadhani, F., Satria, A., & Salamah, S. (2023). Implementasi Algoritma CNN dalam Mengidentifikasi Dini Penyakit pada Mata Katarak. *Sudo Jurnal Teknik Informatika*, 2(4), 167–175. <https://doi.org/10.56211/sudo.v2i4.408>
- Raschka, S., Patterson, J., & Nolet, C. (2020). *Machine learning in python*: Main developments and technology trends in data science, *machine learning*, and artificial intelligence. In *Information (Switzerland)* (Vol. 11, Issue 4). MDPI AG. <https://doi.org/10.3390/info11040193>
- Sai Susanth, G., Jenila Livingston, L. M., & Agnel Livingston, L. G. X. (2021). Garbage Waste Segregation Using *Deep learning* Techniques. *IOP Conference Series: Materials Science and Engineering*, 1012(1), 012040. <https://doi.org/10.1088/1757-899x/1012/1/012040>
- Salvi, M., Acharya, U. R., Molinari, F., & Meiburger, K. M. (2021). The impact of pre- and post-*image* processing techniques on *deep learning* frameworks: A comprehensive review for digital pathology *image* analysis. In *Computers in Biology and Medicine* (Vol. 128). Elsevier Ltd. <https://doi.org/10.1016/j.compbiomed.2020.104129>
- Sevinç, A., & Ozyurt, F. (2022). Classification of recyclable waste using *deep learning* architectures. *FIRAT UNIVERSITY JOURNAL OF EXPERIMENTAL AND COMPUTATIONAL ENGINEERING*, 1(3), 122–128. <https://doi.org/10.5505/fujece.2022.83997>

- Shadiq, J., Safei, A., Wahyudin Ratu Loly, R., sitasi, C., Rwr, L., & Aplikasi Peminjaman Kendaraan Operasional Kantor Menggunakan BlackBox Testing, P. (2021). INFORMATION MANAGEMENT FOR EDUCATORS AND PROFESSIONALS Pengujian Aplikasi Peminjaman Kendaraan Operasional Kantor Menggunakan BlackBox Testing. *Information Management for Educators and Professionals*, 5(2), 97–110.
- Shi, C., Tan, C., Wang, T., & Wang, L. (2021). A waste classification method based on a multilayer hybrid convolution neural network. *Applied Sciences (Switzerland)*, 11(18). <https://doi.org/10.3390/app11188572>
- Silaparasetty, N. (2020). *Machine learning Concepts with Python and the Jupyter Notebook Environment: Using Tensorflow 2.0*. In *Machine learning Concepts with Python and the Jupyter Notebook Environment: Using Tensorflow 2.0*. Springer International Publishing. <https://doi.org/10.1007/978-1-4842-5967-2>
- Stojnev, D., & Stojnev Ilić, A. (2020). Preprocessing Image Data for Deep learning. *International Scientific Conference on Information Technology and Data Related Research*, 312–317. <https://doi.org/10.15308/sinteza-2020-312-317>
- Sunardi, Yudhana, A., & Fahmi, M. (2023a). Improving Waste Classification Using CNNs: An Application of Machine learning for Effective Environmental Management. *Revue d'Intelligence Artificielle*, 37(4), 845–855. <https://doi.org/10.18280/ria.370404>
- Sunardi, Yudhana, A., & Fahmi, M. (2023b). SVM-CNN Hybrid Classification for Waste Image Using Morphology and HSV Color Model Image Processing. *Traitement Du Signal*, 40(4), 1763–1769. <https://doi.org/10.18280/ts.400446>
- Sun, Y., Xue, B., Zhang, M., Yen, G. G., & Lv, J. (2020). Automatically Designing CNN Architectures Using the Genetic Algorithm for Image Classification. *IEEE Transactions on Cybernetics*, 50(9), 3840–3854. <https://doi.org/10.1109/TCYB.2020.2983860>
- Syiarul Amrullah, M., & Fachri Pane, S. (2023). *Analisis Sentimen Masyarakat Terhadap Kebijakan Polisi Tilang Manual Di Indonesia*. Penerbit Buku Pedia.
- Taye, M. M. (2023). Theoretical Understanding of CNN: Concepts, Architectures, Applications, Future Directions. In *Computation* (Vol. 11, Issue 3). MDPI. <https://doi.org/10.3390/computation11030052>
- Vo, A. H., Hoang Son, L., Vo, M. T., & Le, T. (2019). A Novel Framework for Trash Classification Using Deep Transfer learning. *IEEE Access*, 7, 178631–178639. <https://doi.org/10.1109/ACCESS.2019.2959033>
- Vulli, A., Srinivasu, P. N., Sashank, M. S. K., Shafi, J., Choi, J., & Ijaz, M. F. (2022). Fine-Tuned DenseNet-169 for Breast Cancer Metastasis Prediction Using FastAI and 1-Cycle Policy. *Sensors*, 22(8). <https://doi.org/10.3390/s22082988>
- Wang, J., Kuo, T. Y., Li, L., & Zeller, A. (2020). Assessing and Restoring Reproducibility of Jupyter Notebooks. *Proceedings - 2020 35th IEEE/ACM International Conference on Automated Software Engineering, ASE 2020*, 138–149. <https://doi.org/10.1145/3324884.3416585>
- Widia, D. M., & Asriningtias, S. R. (2021). *Cara Cepat dan Praktis Membangun Web Dinamis dengan PHP dan MySQL*. Universitas Brawijaya Press.

- Wu, F., & Lin, H. (2022). Effect of *transfer learning* on the performance of VGGNet-16 and ResNet-50 for the classification of organic and residual waste. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.1043843>
- Xiao, K., Engstrom, L., Ilyas, A., & Madry, A. (2020). *Noise or Signal: The Role of Image Backgrounds in Object Recognition*. <http://arxiv.org/abs/2006.09994>
- Yadav, A., & Surendra Yadav, D. (2024). Enhancing Oral Squamous Cell Carcinoma Detection: A *Transfer learning* Perspective on Histopathological Analysis Using ResNet-18, AlexNet, DenseNet-169, and DenseNet-201 with *Cyclic Learning rate*. *International Journal of Intelligent Systems and Applications in Engineering*, 12(17s), 689–699. www.ijisae.org
- Yasin, E. H. E., & Kornel, C. (2024). Evaluating Satellite Image Classification: Exploring Methods and Techniques. In *Geographic Information Systems-Data Science Approach*. www.intechopen.com
- Yong, L., Ma, L., Sun, D., & Du, L. (2023). Application of *Mobilenetv2* to waste classification. *PLoS ONE*, 18(3 March). <https://doi.org/10.1371/journal.pone.0282336>
- Zailani, A. U., & Hanun, N. L. (2020). PENERAPAN ALGORITMA KLASIFIKASI RANDOM FOREST UNTUK PENENTUAN KELAYAKAN PEMBERIAN KREDIT DI KOPERASI MITRA SEJAHTERA. *Infotech: Journal of Technology Information*, 6(1), 7–14. <https://doi.org/10.37365/jti.v6i1.61>
- Zeng, M., Lu, X., Xu, W., Zhou, T., & Liu, Y. (2020). PublicGarbageNet : A *Deep learning* Framework for Public Garbage Classification. *Proceedings of the 39th Chinese Control Conference*.
- Zhang, Q., Yang, Q., Zhang, X., Bao, Q., Su, J., & Liu, X. (2021). Waste *image* classification based on *transfer learning* and CNN. *Waste Management*, 135, 150–157. <https://doi.org/10.1016/j.wasman.2021.08.038>
- Zheng, H., & Gu, Y. (2021). Encnn-upmws: Waste classification by a CNN ensemble using the UPM weighting strategy. *Electronics (Switzerland)*, 10(4), 1–21. <https://doi.org/10.3390/electronics10040427>
- Zhu, S., Chen, H., Wang, M., Guo, X., Lei, Y., & Jin, G. (2019). Plastic solid waste identification system based on near infrared spectroscopy in combination with *Support Vector Machine*. *Advanced Industrial and Engineering Polymer Research*, 2(2), 77–81. <https://doi.org/10.1016/j.aiepr.2019.04.001>



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ANTARA MOBILENETV2 DAN DENSENET169

Tanggal	Catatan	Paraf
2024-03-29	Konsultasi Judul dan Latar Belakang	
2024-04-03	Revisi Bab 1 Latar Belakang	
2024-04-10	Acc Bab 1 dan Pengajuan Bab 2	
2024-04-19	Revisi Bab 2, Penambahan Teori dan Literature Review	
2024-04-26	Acc Bab 2 dan Pengajuan Bab 3	
2024-05-03	Revisi Bab 3 dan Penambahan Flowchart	
2024-05-10	Acc Bab 3 dan Pengajuan Bab 4	
2024-05-17	Revisi Bab 4, Melengkapi Hasil dan Pembahasan Lebih Detail	
2024-05-31	Acc Bab 4 dan Pengajuan Bab 5	
2024-06-07	Revisi Bab 5 dan Pengajuan Abstrak	
2024-06-14	Acc Bab 5, Revisi Abstrak dan Perbaiki Referensi Citasi	
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Mengetahui

Ketua Program Studi



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Tangerang, 01 August 2024

Pembimbing



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