DAFTAR PUSTAKA

Aouadi, B., Zaukuu, J. L. Z., Vitális, F., Bodor, Z., Fehér, O., Gillay, Z., Bazar, G., & Kovacs, Z. (2020). Historical Evolution and Food Control Achievements of Near Infrared Spectroscopy, Electronic Eose, and Electronic Tongue - Critical Overview. *Sensors (Switzerland)*, *20*(19), 1–42. https://doi.org/10.3390/s20195479

Astuti, S. D., Fanany Al Isyrofie, A. I., Nashichah, R., Kashif, M., Mujiwati, T., Susilo, Y., Winarno, & Syahrom, A. (2022). Gas Array Sensors Based on Electronic Nose for Detection of Tuna (Euthynnus Affinis) Contaminated by Pseudomonas Aeruginosa. *Journal of Medical Signals and Sensors*, *12*(4), 306–316. https://doi.org/10.4103/jmss.jmss_139_21

Bande, L. O., R, A. K., Saefuddin, Haetami, A., Alwi, L., Mariadi, & Satrah, V. N. (2020). Pelatihan Pembuatan Pupuk Hayati, Agens Hayati dan Pestisida Nabati Desa Aunupe Kabupaten Konawe Selatan. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 120–126. https://doi.org/10.31849/dinamisia.v4i1.3512

Boateng, E. Y., Otoo, J., & Abaye, D. A. (2020). Basic Tenets of Classification Algorithms K-Nearest-Neighbor, Support Vector Machine, Random Forest and Neural Network: A Review. *Journal of Data Analysis and Information Processing*, *08*(04), 341–357. https://doi.org/10.4236/jdaip.2020.84020

Bojke, A., Tkaczuk, C., Stepnowski, P., & Gołębiowski, M. (2018). Comparison of volatile compounds released by entomopathogenic fungi. *Microbiological Research*, *214*, 129–136. https://doi.org/10.1016/j.micres.2018.06.011

Borowik, P., Adamowicz, L., Tarakowski, R., Wacławik, P., Oszako, T., Ślusarski, S., & Tkaczyk, M. (2021). Development of a Low-Cost Electronic Nose for Detection of Pathogenic Fungi and Applying it to Fusarium Oxysporum and Rhizoctonia Solani. *Sensors*, *21*(17). https://doi.org/10.3390/s21175868

Borowik, P., Dyshko, V., Tarakowski, R., Tkaczyk, M., Okorski, A., & Oszako, T. (2023). Analysis of the Response Signals of an Electronic Nose Sensor for Differentiation Between Fusarium Species. *Sensors*, *23*(18). https://doi.org/10.3390/s23187907

Brattain, W. H., & Bardeen, J. (1952). Surface Properties of Germanium. *The Bell System Technical Journal* , *32*(1), 1–41.

Cellini, A., Blasioli, S., Biondi, E., Bertaccini, A., Braschi, I., & Spinelli, F. (2017). Potential Applications and Limitations of Electronic Nose Devices for Plant

Disease Diagnosis. *Sensors (Switzerland)*, *17*(11), 1–13. https://doi.org/10.3390/s17112596

Debataraja, C. O. (2021, August 1). Prospek Penggunaan Agensia Hayati dalam Mewujudkan Perkebunan Berkelajutan di Indonesia. *Riset Perkebunan Nusantara*, *2*, 2–5.

Durán-Lara, E. F., Valderrama, A., & Marican, A. (2020). Natural Organic Compounds for Application in Organic Farming. *Agriculture (Switzerland)*, *10*(2), 1–22. https://doi.org/10.3390/agriculture10020041

Erawati, D. N., & Wardati, I. (2016). Teknologi Pengendali Hayati Metarhizium anisopliae dan Beauveria bassiana terhadap Hama Kumbang Kelapa Sawit (Oryctes rhinoceros). *Seminar Nasional Hasil Penelitian Dan Pengabdian Masyarakat*.

Erlin, E., Desnelita, Y., Nasution, N., Suryati, L., & Zoromi, F. (2022). Dampak SMOTE terhadap Kinerja Random Forest Classifier berdasarkan Data Tidak seimbang. *MATRIK : Jurnal Manajemen, Teknik Informatika Dan Rekayasa Komputer*, *21*(3), 677–690. https://doi.org/10.30812/matrik.v21i3.1726

Estananto, N., & Rizal, A. (2018). Klasifikasi Sinyal Elektrokardiogram Menggunakan Renyi Entropy. *Jurnal ELEMENTER*, *4*(2), 11–18. http://jurnal.pcr.ac.id

Fahmiati, Susila, W. A., Anindita, N. S., & Nugraheni, I. A. (2023). Uji Efektifitas Agen Biokontrol Beauveria bassiana sebagai Pengendali Ulat Grayak (Spodoptera litura). *Prosiding Seminar Nasional Penelitian Dan Pengabdian Kepada Masyarakat LPPM Universitas 'Aisyiyah Yogyakarta*, *1*, 137–142.

Ghaffari, R., Laothawornkitkul, J., Iliescu, D., Hines, E., Leeson, M., Napier, R., Moore, J. P., Paul, N. D., Hewitt, C. N., & Taylor, J. E. (2012). Plant pest and disease diagnosis using electronic nose and support vector machine approach. *Journal of Plant Diseases and Protection*, *119*(6), 200–207.

Halliday, D., Resnick, R., & Walker, J. (2018). *Fundamentals of Physics*. John Wiley & Sons,.

Hartono, H., Abdullatif, F., Aziz, A. N., Sehah, S., Sugito, S., & Silalahi, S. P. (2022). Rancang Bangun Data Logger Berbasis Arduino Sebagai Penyimpan Data. *Jurnal Teras Fisika*, *5*(2), 23. https://doi.org/10.20884/1.jtf.2022.5.2.6887

Heriyanto, & Suharno. (2020). Studi Patogenitas Metarhizium anisopliae (metch.) Sor Hasil Perbanyakakan Medium Cail Alami Terhadap Larva Oryctes rhinoceros. *Jurnal Ilmu-Ilmu Pertanian*, *4*(1), 47–54.

Jaaniso, R., & Tan, O. K. (2013). *Semiconductor Gas Sensors*. Woodhead Publishing.

Karsli, A., & Şahin, Y. S. (2021). The Role of Fungal Volatile Organic Compounds (FVOCs) in Biological Control. *Türkiye Biyolojik Mücadele Dergisi*, *12*(1), 79–92. https://doi.org/10.31019/tbmd.818701

Kittel, C. (2005). *Introduction to Solid State Physics (Eight Edition)*. John Wiley & Sons.

Kong, W. L., Ni, H., Wang, W. Y., & Wu, X. Q. (2022). Antifungal effects of volatile organic compounds produced by Trichoderma koningiopsis T2 against Verticillium dahliae. *Frontiers in Microbiology*, *13*. https://doi.org/10.3389/fmicb.2022.1013468

Kresnawaty, I., Mulyatni, A. S., Eris, D. D., Prakoso, H. T., Tri-Panji, Triyana, K., & Widiastuti, H. (2020, April 27). Electronic Nose for Early Detection of Basal Stem Rot Caused by Ganoderma in Oil Palm. *IOP Conference Series: Earth and Environmental Science*, *468*(1), 1–8. https://doi.org/10.1088/1755-1315/468/1/012029

Liu, H., Li, Q., Yan, B., Zhang, L., & Gu, Y. (2019). Bionic Electronic Nose Based on MOS Sensors Array and Machine Learning Algorithms Used for Wine Properties Detection. *Sensors (Switzerland)*, *19*(1). https://doi.org/10.3390/s19010045

Loera-Corral, O., Porcayo-Loza, J., Montesinos-Matias, R., & Favela-Torres, E. (2016). Production of Conidia by the Fungus Metarhizium anisopliae using Solid-State Fermentation. In *Methods in Molecular Biology* (Vol. 1477, pp. 61–69). Humana Press Inc. https://doi.org/10.1007/978-1-4939-6367-6_6

M. Sokolova, & G. Lapalme. (2009). A Systematic Analysis of Performance Measures for Classification Tasks. *Inf. Process. Manag*, *45*(5), 427–437.

Mattedi, A., Sabbi, E., Farda, B., Djebaili, R., Mitra, D., Ercole, C., Cacchio, P., Del Gallo, M., & Pellegrini, M. (2023). Solid-State Fermentation: Applications and Future Perspectives for Biostimulant and Biopesticides Production. *Microorganisms*, *11*(6). https://doi.org/10.3390/microorganisms11061408

Moshayedi, A. J., Khan, A. S., Shuxin, Y., Kuan, G., Jiandong, H., Soleimani, M., & Razi, A. (2023). E-Nose Design and Structures from Statistical Analysis to Application in Robotic: A Compressive Review. *EAI Endorsed Transactions on AI and Robotics*, *2*(1), e1. https://doi.org/10.4108/airo.v2i1.3056

Müller, A. C., & Guido, S. (2017). *Introduction to Machine Learning with Python : A Guide for Data Scientists*. O'Reilly.

Naufal, S. A., Adiwijaya, A., & Astuti, W. (2020). Analisis Perbandingan Klasifikasi Support Vector Machine (SVM) dan K-Nearest Neighbors (KNN) untuk Deteksi Kanker dengan Data Microarray. *JURIKOM (Jurnal Riset Komputer)*, *7*(1), 162. https://doi.org/10.30865/jurikom.v7i1.2014

Nikolic, M. V., Milovanovic, V., Vasiljevic, Z. Z., & Stamenkovic, Z. (2020). Semiconductor gas sensors: Materials, technology, design, and application. *Sensors (Switzerland)*, *20*(22), 1–31. https://doi.org/10.3390/s20226694

Novita, D. D., Sesunan, A. B., Telaumbanua, M., Triyono, S., & Saputra, T. W. (2021). Identifikasi Jenis Kopi Menggunakan Sensor E-Nose Dengan Metode Pembelajaran Jaringan Syaraf Tiruan Backpropagation. *Jurnal Ilmiah Rekayasa Pertanian Dan Biosistem*, *9*(2), 205–217. https://doi.org/10.29303/jrpb.v9i2.241

Nugroho, A. A., Wijaya, W., Hendry, J., & Sumanto, B. (2022). Seleksi Fitur Aroma Teh Kombucha Menggunakan ANN untuk Optimasi Kinerja Sistem E-nose. *ELKOMIKA: Jurnal Teknik Energi Elektrik, Teknik Telekomunikasi, & Teknik Elektronika*, *10*(2), 334. https://doi.org/10.26760/elkomika.v10i2.334

Raschka, S., & Mirjalili, V. (2019). *Python machine learning : machine learning and deep learning with python, scikit-learn, and tensorflow 2* (Third edition). Packt Publishing.

Reddypriya, P., Soumare, A., & Balachandar, D. (2019). Multiplex and Quantitative PCR Targeting SCAR Markers for Strain-Level Detection and Quantification of Biofertilizers. *Journal of Basic Microbiology*, *59*(1), 111–119. https://doi.org/10.1002/jobm.201800318

Reidt, U., Helwig, A., Müller, G., Lenic, J., Grosser, J., Fetter, V., Kornienko, A., Kharin, S., Novikova, N., & Hummel, T. (2020). Detection of Microorganisms with an Electronic Nose for Application under Microgravity Conditions. *Gravitational and Space Research*, *8*(1), 1–17. https://doi.org/10.2478/gsr-2020-0001

Rikta, S. T., Uddin, K. M. M., Biswas, N., Mostafiz, R., Sharmin, F., & Dey, S. K. (2023). XML-GBM lung: An Explainable Machine Learning-Based Application for The Diagnosis of Lung Cancer. *Journal of Pathology Informatics*, *14*, 100307. https://doi.org/10.1016/j.jpi.2023.100307

Santos, P. de S., Abati, K., Mendoza, N. V. R., Mascarin, G. M., & Delalibera Júnior, I. (2021). Nutritional Impact of Low-Cost Substrates on Biphasic Fermentation for Conidia Production of The Fungal Biopesticide Metarhizium

anisopliae. *Bioresource Technology Reports*, *13*. https://doi.org/10.1016/j.biteb.2020.100619

Saruhan, B., Lontio Fomekong, R., & Nahirniak, S. (2021). Review: Influences of Semiconductor Metal Oxide Properties on Gas Sensing Characteristics. *Frontiers in Sensors*, *2*. https://doi.org/10.3389/fsens.2021.657931

Setiati, N., Maretta, Y. A., Indriyanti, D. R., & Damayanti, I. B. (2018a). Mortality and Tissue Damage of Oryctes Rhinoceros Larvae Infected by Metarhizium anisopliae. *Article in ARPN Journal of Engineering and Applied Sciences*, *13*(6). www.arpnjournals.com

Setiati, N., Maretta, Y. A., Indriyanti, D. R., & Damayanti, I. B. (2018b). Mortality and Tissue Damage of Oryctes Rhinoceros Larvae Infected by Metarhizium anisopliae. *Article in ARPN Journal of Engineering and Applied Sciences*, *13*(6). www.arpnjournals.com

Simon, S. H. (2013). *The Oxford Solid State Basics*. Oxford University Press.

Sitompul, A., Iswanto, B. H., & Indrasari, W. (2020, December). Analisis Cluster Bahan Herbal Berdasarkan Fitur Respon E-Nose. *Prosiding Seminar Nasional Fisika (E-Journal) SNF2020*. https://doi.org/10.21009/03.SNF2020

Solichah, C., Poerwanto, M. E., & Wicaksono, D. (2022). *Jamur Metarhizium Sebagai Agen Hayati Pengendali Hama Tanaman*. Lembaga Penelitian dan Pengabdian kepada Masyarakat UPN Veteran Yogyakarta.

Stone, L. B. L., & Bidochka, M. J. (2020). The multifunctional lifestyles of Metarhizium: evolution and applications. In *Applied Microbiology and Biotechnology* (Vol. 104, Issue 23, pp. 9935–9945). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s00253-020-10968-3

Sudantha, I. M. (2017). Eksplorasi Sumberdaya Alam (Biokompos, Bioaktivator, Biochar dan FMA) Untuk Mengembangkan Tanaman Pangan Sistem Organik Di Lahan Kering. *Seminar Nasional MIPA 2017*, 137.

Sukanli, R. P. P., Fathona, I. W., & Abrar. (2019). Rancang Bangun Alat Uji Sifat Listrik Untuk Karakterisasi Kurva I-V Dan Kurva Respon Pada Sensor Gas Untuk Nano Bahan Semikonduktor. *EProceedings of Engineering*, *6*(2).

Sumanto, B., Idianingrum TW, Y., Humaira, S., Lestari Budiani, R., & Arrofiq, M. (2023). Aplikasi E-nose dengan kemometrik untuk Monitoring Proses Fermentasi Teh Kombucha. *JST (Jurnal Sains Dan Teknologi)*, *12*(1), 39–47. https://doi.org/10.23887/jstundiksha.v12i1.50994

Sureshkumar, N., & Dutta, A. (2019). Environmental Gas Sensors Based on Nanostructured Thin Films. In *Versatile Applications for Materials Engineering*. www.intechopen.com

Suswanto, I., Sarbino, & Maherawati. (2020). Pengendalian Hama Kumbang Badak Pada Kebun Kelapa Masyarakat. *JMM (Jurnal Masyarakat Mandiri)*, *4*(5), 752–763. https://doi.org/10.31764/jmm.v4i5.2953

Syahnen, D. D. N., Sirait, S. E. B., & Pinem. (2014). *Teknik Uji Mutu Agens Pengendali Hayati (APH) di Laboratorium. (Online).* http://ditjenbun.deptan.go.id/BBPPTPmed/

Tan, J., & Xu, J. (2020). Applications of Electronic Nose (E-Nose) and Electronic Tongue (E-Tongue) in Food Quality-Related Properties Determination: A Review. *Artificial Intelligence in Agriculture*, *4*, 104–115. https://doi.org/10.1016/j.aiia.2020.06.003

Wang, K., Ke, S., Fang, W., Liu, F., & Zhang, Z. (2023). Agroactive volatile organic compounds from microbes: Chemical diversities and potentials of application in crop protection. *Advanced Agrochem*, *2*(1), 39–57. https://doi.org/10.1016/j.aac.2022.12.004

Widodo, S. (2019). Review Sensor Gas Berbasis Metal Oksida Semikonduktor untuk Mendeteksi Gas Polutan Yang Selektif dan Sensitif. *Jurnal Techno-Socio Ekonomika*, *12*(2).

Yilmaz, R., & Yagin, F. H. (2022). Early Detection of Coronary Heart Disease Based on Machine Learning Methods. *Medical Records*, *4*(1), 1–6. https://doi.org/10.37990/medr.1011924

Yoon, Y., Truong, P. L., Lee, D., & Ko, S. H. (2022). Metal-Oxide Nanomaterials Synthesis and Applications in Flexible and Wearable Sensors. In *ACS Nanoscience Au* (Vol. 2, Issue 2, pp. 64–92). American Chemical Society. https://doi.org/10.1021/acsnanoscienceau.1c00029

Zhang, Z., Zhou, Q., Qiu, S., Zhou, J., & Huang, J. (2023). Efficient Monitoring of Microbial Communities and Chemical Characteristics in Incineration Leachate with Electronic Nose and Data Mining Techniques. *Chemosensors*, *11*(4). https://doi.org/10.3390/chemosensors11040229