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Identification and Classification of Pathogenic Bacteria Using the K-Nearest Neighbor Method

Identifikasi Dan Klasifikasi Bakteri Patogen Dengan Metode K-Nearest Neighbour

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Bacteria are a group of living things or organisms that do not have a core covering. In the grouping, some bacteria are pathogenic.
With a microscopic size, many pathogenic bacteria are found around and spread through the food eaten or by touching objects around
them, then cause diseases such as diarrhea, vomiting, and others. As a more effective effort to help the government and society prevent
disease caused by pathogenic bacteria, a system for the identification and classification of pathogenic bacteria K-Nearest Neighbor
was created. This system uses a biological microscope that is attached to a webcam camera above the ocular lens as a tool to see
bacterial objects and assist in bacterial capture. Rough player rotates automatically (auto-focus) in image capture. In the process of
classification and identifying bacteria, the K-Nearest Neighbor method is used,
which is a method with the calculation of the nearest
neighbor or calculation based on the level of similarity to the dataset. In this study, the bacteria vibrio chlorae, staphylococcus
aereus, and streptococcus m. with the highest accuracy is the K = 9 value of 97.77% using the Chebyshev method.

References

1. M. V Holderman, E. De Queljoe, S. B. Rondonuwu, and P. S. Biologi, “Identification Of Bacteria In Handrail Escalator on,” J. Ilm. Sains, vol. 17, no. 1, pp. 13–18, 2017.
2. A. Nuryah, N. Yuniarti, and I. Puspitasari, “Prevalensi dan Evaluasi Kesesuaian Penggunaan Antibiotik pada Pasien dengan Infeksi Methicillin Resistant Staphylococcus Aureus di RSUP Dr. Soeradji Tirtonegoro Klaten,” Maj. Farm., vol. 15, no. 2, p. 123, 2019, doi: 10.22146/farmaseutik.v15i2.47911.
3. H. Tolle, “Klasifikasi dan Identifikasi Jumlah Koloni,” vol. 8, no. 2, pp. 78–82, 2016.
4. E. Priyanti, “Penerapan Algoritma Naïve Bayes Untuk Klasifikasi Bakteri Gram-Negatif,” J. Tek. Komput., vol. III, no. 2, pp. 68–76, 2017.
5. M. F. Wahid, T. Ahmed, and M. A. Habib, “Classification of microscopic images of bacteria using deep convolutional neural network,” ICECE 2018 - 10th Int. Conf. Electr. Comput. Eng., pp. 217–220, 2019, doi: 10.1109/ICECE.2018.8636750.
6. B. D. Satoto, I. Utoyo, and R. Rulaningtyas, “Colour segmentation of Gram-Negative bacteria using graph Quadratic Form and Random Walker,” J. Phys. Conf. Ser., vol. 1538, no. 1, pp. 0–8, 2020, doi: 10.1088/1742-6596/1538/1/012005.
7. J. R. Balbin, J. T. Sese, C. V. R. Babaan, D. M. M. Poblete, R. P. Panganiban, and J. G. Poblete, “Detection and classification of bacteria in common street foods using electronic nose and support vector machine,” Proc. - 7th IEEE Int. Conf. Control Syst. Comput. Eng. ICCSCE 2017, vol. 2017-Novem, no. November, pp. 247–252, 2018, doi:

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10.1109/ICCSCE.2017.8284413.
8. T. Treebupachatsakul and S. Poomrittigul, “Bacteria Classification using Image Processing and Deep learning,” 34th Int. Tech. Conf. Circuits/Systems, Comput. Commun. ITC-CSCC 2019, pp. 2–4, 2019, doi: 10.1109/ITC-CSCC.2019.8793320.
9. A. S. Lee et al., “Methicillin-resistant Staphylococcus aureus,” Nat. Rev. Dis. Prim., vol. 4, no. May, pp. 1–23, 2018, doi: 10.1038/nrdp.2018.33.
10. J. A. Lemos et al., “The Biology of Streptococcus mutans,” Microbiol. Spectr., vol. 7, no. 1, pp. 16–18, 2019, doi: 10.1128/microbiolspec.gpp3-0051-2018.
11. D. Domman et al., “the Americas,” vol. 793, no. November, pp. 789–793, 2017.
12. K. Neighbor, E. Distance, and P. Gambar, “Buku TA : K-Nearest Neighbor (KNN),” no. x, 2010.
13. T. M. Cover and P. E. Hart, “Nearest Neighbor Pattern Classification,” IEEE Trans. Inf. Theory, vol. 13, no. 1, pp. 21–27, 1967, doi: 10.1109/TIT.1967.1053964.
14. W. Wahyono, I. N. P. Trisna, S. L. Sariwening, M. Fajar, and D. Wijayanto, “Comparison of distance measurement on k-nearest neighbour in textual data classification,” J. Teknol. dan Sist. Komput., vol. 8, no. 1, pp. 54–58, 2020, doi: 10.14710/jtsiskom.8.1.2020.54-58.
15. B. P. Citra, E. Marliana, and A. Wahjudi, “Rancang Bangun Perangkat Lunak Unit Kontrol Alat Ukur Sudu Cross Flow Water Turbine,” vol. 3, no. 2, 2014.
16. A. F. Ibadillah, “Sistem Penjejakan Obyek Dengan Stero Vision.”
17. M. Z. Arifin, K. Joni, M. Ulum, T. Elektro, and U. Trunojoyo, “Penentuan Kualitas Warna Batu Blue Sapphire Dengan Image Processing Menggunakan Metode RGB To HSV,” vol. 1003051623, pp. 59–63.
18. M. Z. Arifin, K. Joni, M. Ulum, T. Elektro, and U. Trunojoyo, “Penentuan Kualitas Warna Batu Blue Sapphire Dengan Image Processing Menggunakan Metode RGB To HSV,” vol. 1003051623, pp. 59–63.

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