

DAFTAR PUSTAKA

- [1] Badan Pusat Statistik Provinsi Daerah Istimewa Yogyakarta, “Statistik Politik dan Keamanan Daerah Istimewa Yogyakarta 2022,” Badan Pusat Statistik Provinsi DIY, Yogyakarta, Publikasi, 2023, diakses September 2024. [Online]. Available: <https://yogyakarta.bps.go.id/publication/2023/11/10/1adc47883549cfb498a7aa80/statistik-politik-dan-keamanan-daerah-istimewa-yogyakarta-2022.html>
- [2] —, “Statistik Politik dan Keamanan Daerah Istimewa Yogyakarta 2023,” Badan Pusat Statistik Provinsi DIY, Yogyakarta, Publikasi, 2024, diakses September 2024. [Online]. Available: <https://yogyakarta.bps.go.id/publication/2024/11/11/bac49a7a32dceb9bb3258583/statistik-politik-dan-keamanan-daerah-istimewa-yogyakarta-2023.html>
- [3] ANTARA News, “Polda DIY Optimalkan Smart City untuk Cegah Kejahatan Jalanan,” 2024, diakses September 2024. [Online]. Available: <https://jogja.antarane.ws.com/berita/688071/polda-diy-mengoptimalkan-smart-city-untuk-cegah-kejahatan-jalanan>
- [4] Kejaksaan Tinggi Daerah Istimewa Yogyakarta, “Rencana Strategis Kejaksaan Tinggi D.I. Yogyakarta Tahun 2025–2029,” 2025.
- [5] A. D. Biderman and A. J. Reiss, “On Exploring the “Dark Figure” of Crime,” *The Annals of the American Academy of Political and Social Science*, vol. 374, no. 1, pp. 1–15, 1967.
- [6] Badan Pusat Statistik, “Statistik Kriminal 2023,” Badan Pusat Statistik Republik Indonesia, Jakarta, Publikasi, 2023, diakses September 2024. [Online]. Available: <https://www.bps.go.id/publication/2023/12/12/5edba2b0fe5429a0f232c736/statistik-kriminal-2023.html>
- [7] Badan Pusat Statistik Kabupaten Kulon Progo, “Kabupaten Kulon Progo dalam Angka 2024,” Badan Pusat Statistik Kabupaten Kulon Progo, Kulon Progo, Publikasi, 2024, diakses September 2024. [Online]. Available: <https://kulonprogokab.bps.go.id/publication/2024/02/28/7a85f967bff5363dd4631b61/kabupaten-kulon-progo-dalam-angka-2024.html>
- [8] C. A. Gotway and L. J. Young, “Combining Incompatible Spatial Data,” *Journal of the American Statistical Association*, vol. 97, no. 458, pp. 632–648, 2002.
- [9] S. Banerjee, B. P. Carlin, and A. E. Gelfand, *Hierarchical Modeling and Analysis for Spatial Data*, 2nd ed. Boca Raton, FL: CRC Press, 2014.
- [10] O. Kounadi, A. Ristea, A. Araujo, and M. Leitner, “A Systematic Review on Spatial Crime Forecasting,” *Crime Science*, vol. 9, no. 1, p. 7, 2020.
- [11] R. E. Fay and R. A. Herriot, “Estimates of Income for Small Places: An Application of James–Stein Procedures to Census Data,” *Journal of the American Statistical Association*, vol. 74, no. 366a, pp. 269–277, 1979.
- [12] J. N. K. Rao and I. Molina, *Small Area Estimation*, 2nd ed. Hoboken, NJ: Wiley, 2015.

- [13] D. Buil-Gil, J. Medina, and N. Shlomo, "Measuring the Dark Figure of Crime in Geographic Areas: Small Area Estimation from the Crime Survey for England and Wales," *The British Journal of Criminology*, vol. 61, no. 2, pp. 364–388, 2021.
- [14] B. S. Pooja, V. Guddattu, and K. A. Rao, "Crime Against Women in India: District-Level Risk Estimation Using the Small Area Estimation Approach," *Frontiers in Public Health*, vol. 12, p. 1362406, 2024.
- [15] P. Krennmair and T. Schmid, "Flexible Domain Prediction Using Mixed Effects Random Forests," *Journal of the Royal Statistical Society Series C: Applied Statistics*, vol. 71, no. 5, pp. 1865–1894, 2022.
- [16] N. Frink and T. Schmid, "Small Area Prediction of Counts under Machine Learning-Type Mixed Models," *Computational Statistics and Data Analysis*, vol. 211, p. 108218, 2025.
- [17] Z. Pawlak, "Rough Sets," *International Journal of Computer and Information Sciences*, vol. 11, no. 5, pp. 341–356, 1982.
- [18] —, *Rough Sets: Theoretical Aspects of Reasoning About Data*. Dordrecht: Kluwer Academic Publishers, 1991.
- [19] Z. Wu, S. Pan, F. Chen, G. Long, C. Zhang, and P. S. Yu, "A Comprehensive Survey on Graph Neural Networks," *IEEE Transactions on Neural Networks and Learning Systems*, vol. 32, no. 1, pp. 4–24, 2021.
- [20] C. Jing, X. Lv, Y. Wang, M. Qin, S. Jin, S. Wu, and G. Xu, "A Deep Multi-Scale Neural Networks for Crime Hotspot Mapping Prediction," *Computers, Environment and Urban Systems*, vol. 109, p. 102089, 2024.
- [21] D. Buil-Gil, "Small Area Estimation in Criminological Research: Theory, Methods, and Applications," Ph.D. dissertation, University of Manchester, Manchester, UK, 2019.
- [22] A. Ubaidillah, K. A. Notodiputro, A. Kurnia, and I. W. Mangku, "Multivariate Fay–Herriot Models for Small Area Estimation with Application to Household Consumption Per Capita Expenditure in Indonesia," *Journal of Applied Statistics*, vol. 46, no. 15, pp. 2845–2861, 2019.
- [23] P. A. Kaban, B. I. Nasution, R. E. Caraka, and R. Kurniawan, "Implementing Night Light Data as Auxiliary Variable of Small Area Estimation," *Communications in Statistics - Theory and Methods*, vol. 53, no. 1, pp. 310–327, 2022.
- [24] N. Permatasari and A. Ubaidillah, "Small Area Estimation of Poverty Using Remote Sensing Data," *Statistical Journal of the IAOS*, vol. 41, no. 1, pp. 180–190, 2025.
- [25] C. MacBride, V. Davies, and D. Lee, "A Spatial Autoregressive Random Forest Algorithm for Small-Area Spatial Prediction," *The Annals of Applied Statistics*, vol. 19, no. 1, pp. 485–504, 2025.
- [26] X. Zhang, L. Liu, L. Xiao, and J. Ji, "Comparison of Machine Learning Algorithms for Predicting Crime Hotspots," *IEEE Access*, vol. 8, pp. 181 302–181 310, 2020.

- [27] V. Mandalapu, L. Elluri, P. Vyas, and N. Roy, "Crime Prediction Using Machine Learning and Deep Learning: A Systematic Review and Future Directions," *IEEE Access*, vol. 11, pp. 60 153–60 170, 2023.
- [28] Q. Zhang, Q. Xie, and G. Wang, "A Survey on Rough Set Theory and Its Applications," *CAAI Transactions on Intelligence Technology*, vol. 1, no. 4, pp. 323–333, 2016.
- [29] K. N. Singh and J. K. Mantri, "A Clinical Decision Support System Using Rough Set Theory and Machine Learning for Disease Prediction," *Intelligent Medicine*, vol. 4, no. 3, pp. 200–208, 2024.
- [30] H. Bhukya and S. Manchala, "Design of Metaheuristic Rough Set-Based Feature Selection and Rule-Based Medical Data Classification Model on MapReduce Framework," *Journal of Intelligent Systems*, vol. 31, no. 1, pp. 1002–1013, 2022.
- [31] S. S. Kshatri, D. Singh, B. Narain, S. Bhatia, M. T. Quasim, and G. R. Sinha, "An Empirical Analysis of Machine Learning Algorithms for Crime Prediction Using Stacked Generalization: An Ensemble Approach," *IEEE Access*, vol. 9, pp. 67 488–67 500, 2021.
- [32] X. Zhang, L. Liu, M. Lan, G. Song, L. Xiao, and J. Chen, "Interpretable Machine Learning Models for Crime Prediction," *Computers, Environment and Urban Systems*, vol. 94, p. 101789, 2022.
- [33] M. R. Khatun, S. I. Ayon, M. R. Hossain, and M. J. Alam, "Data Mining Technique to Analyse and Predict Crime Using Crime Categories and Arrest Records," *Indonesian Journal of Electrical Engineering and Computer Science*, vol. 22, no. 2, pp. 1052–1060, 2021.
- [34] D. Pfeiffermann, "New Important Developments in Small Area Estimation," *Statistical Science*, vol. 28, no. 1, pp. 40–68, 2013.
- [35] L. Breiman, "Random Forests," *Machine Learning*, vol. 45, no. 1, pp. 5–32, 2001.
- [36] Y. Yao, "Three-Way Decisions with Probabilistic Rough Sets," *Information Sciences*, vol. 180, no. 3, pp. 341–353, 2010.
- [37] D. Liu, T. Li, and J. Zhang, "A Decision-Theoretic Rough Set Approach for Dynamic Data Mining," *IEEE Transactions on Fuzzy Systems*, vol. 23, no. 6, pp. 1958–1970, 2015.
- [38] K. Lum and W. Isaac, "To Predict and Serve?" *Significance*, vol. 13, no. 5, pp. 14–19, 2016.
- [39] H. Zhang, G. Suresh, and Y. Qiu, "Issues in the Aggregation and Spatial Analysis of Neighborhood Crime," *Annals of GIS*, vol. 18, no. 3, pp. 173–183, 2012.
- [40] T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, 2nd ed. New York, NY: Springer, 2009.

- [41] Kejaksaan Republik Indonesia, “Peraturan Kejaksaan Republik Indonesia Nomor 5 Tahun 2021 tentang Sistem Pengelolaan Data dan Informasi Intelijen Kejaksaan Republik Indonesia,” Berita Negara Republik Indonesia Tahun 2021 Nomor 1154, Jakarta, 2021, ditetapkan 14 Oktober 2021. [Online]. Available: <https://peraturan.bpk.go.id/Details/226088/peraturan-kejaksaan-no-5-tahun-2021>
- [42] S. Burhanuddin, “Pernyataan Jaksa Agung tentang Pentingnya Kesiapan Satu Data dan Digitalisasi Kejaksaan,” Siaran Resmi Kejaksaan Agung Republik Indonesia, dikutip dalam Hukumonline, 2023, diakses September 2024. [Online]. Available: <https://www.hukumonline.com/berita/a/jaksa-agung-tekankan-pentingnya-kesiapan-satu-data-dan-digitalisasi-kejaksaan-lt642c6cbc2bbbe/>
- [43] J. N. K. Rao and M. Yu, “Small-area estimation by combining time-series and cross-sectional data,” *Canadian Journal of Statistics*, vol. 22, no. 4, pp. 511–528, 1994.
- [44] M. C. Otto and W. R. Bell, “Sampling error modelling of poverty and income statistics for states,” in *Proceedings of the Section on Government Statistics*. American Statistical Association, 1995, pp. 160–165.
- [45] J. Jiang, P. Lahiri, and S.-M. Wan, “A unified jackknife theory for empirical best prediction with m-estimation,” *Annals of Statistics*, vol. 30, no. 6, pp. 1782–1810, 2002.
- [46] D. Lambert, “Zero-inflated poisson regression, with an application to defects in manufacturing,” *Technometrics*, vol. 34, no. 1, pp. 1–14, 1992.
- [47] J. Mullahy, “Specification and testing of some modified count data models,” *Journal of Econometrics*, vol. 33, no. 3, pp. 341–365, 1986.
- [48] L. Vomfell, W. K. Härdle, and S. Lessmann, “Improving Crime Count Forecasts Using Twitter and Taxi Data,” *Decision Support Systems*, vol. 113, pp. 73–85, 2018.
- [49] B. Wang, X. Luo, F. Zhang, B. Yuan, A. L. Bertozzi, and P. J. Brantingham, “Graph-Based Deep Modeling and Real Time Forecasting of Sparse Spatio-Temporal Data,” in *Proceedings of the 4th International Workshop on Mining and Learning from Time Series (MiLeTS), KDD 2018*, London, UK, 2018.
- [50] Badan Pusat Statistik Kabupaten Sleman, “Kabupaten Sleman dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://slemankab.bps.go.id/publication/2024/02/28/a5194f8cfd3cc96a35805f6e/sleman-regency-in-figures-2024.html>
- [51] Badan Pusat Statistik Kabupaten Bantul, “Kabupaten Bantul dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://bantulkab.bps.go.id/publication/2024/02/28/8445c85bf2416b832c655225/kabupaten-bantul-dalam-angka-2024.html>
- [52] Badan Pusat Statistik Kabupaten Kulon Progo, “Kabupaten Kulon Progo dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://kulonprogokab.bps.go.id/publication/2024/02/28/7a85f967bff5363dd4631b61/kabupaten-kulon-progo-dalam-angka-2024.html>

- [53] Badan Pusat Statistik Kabupaten Gunungkidul, “Kabupaten Gunungkidul dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://gunungkidulkab.bps.go.id/publication/2024/02/28/16727165b49c4287744a4743/kabupaten-gunungkidul-dalam-angka-2024.html>
- [54] Badan Pusat Statistik Kota Yogyakarta, “Kota Yogyakarta dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://jogjakota.bps.go.id/publication/2024/02/28/6a6d984e3d10d2113c9d3f3b/kota-yogyakarta-dalam-angka-2024.html>
- [55] Dinas Kependudukan dan Pencatatan Sipil Kabupaten Sleman, “Data Kependudukan Kabupaten Sleman,” 2024, diakses September 2024. [Online]. Available: https://dukcapil.slemankab.go.id/home/info_wajib_berkala
- [56] Dinas Kependudukan dan Pencatatan Sipil Kabupaten Bantul, “Data Kependudukan Kabupaten Bantul,” 2024, diakses September 2024. [Online]. Available: <https://disdukcapil.bantulkab.go.id/hal/publikasi-data-kependudukan-data-agregat>
- [57] Dinas Kependudukan dan Pencatatan Sipil Kabupaten Kulon Progo, “Data Kependudukan Kabupaten Kulon Progo,” 2024, diakses September 2024. [Online]. Available: <https://dukcapil.kulonprogokab.go.id/detil/77/profil-kependudukan>
- [58] Dinas Kependudukan dan Pencatatan Sipil Kabupaten Gunungkidul, “Data Kependudukan Kabupaten Gunungkidul,” 2024, diakses September 2024. [Online]. Available: https://dukcapil.gunungkidulkab.go.id/kategori_dokumen/agregat-kependudukan/
- [59] Dinas Kependudukan dan Pencatatan Sipil Kota Yogyakarta, “Data Kependudukan Kota Yogyakarta,” 2024, diakses September 2024. [Online]. Available: <https://dindukcapil.jogjakota.go.id/download/index/data-agregat-kependudukan>
- [60] Badan Pusat Statistik Kabupaten Sleman, “Kabupaten Sleman dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://slemankab.bps.go.id/publication/2024/02/28/a5194f8cfd3cc96a35805f6e/sleman-regency-in-figures-2024.html>
- [61] Badan Pusat Statistik Kabupaten Bantul, “Kabupaten Bantul dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://bantulkab.bps.go.id/publication/2024/02/28/8445c85bf2416b832c655225/kabupaten-bantul-dalam-angka-2024.html>
- [62] Badan Pusat Statistik Kabupaten Kulon Progo, “Kabupaten Kulon Progo dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://kulonprogokab.bps.go.id/publication/2024/02/28/7a85f967bff5363dd4631b61/kabupaten-kulon-progo-dalam-angka-2024.html>
- [63] Badan Pusat Statistik Kabupaten Gunungkidul, “Kabupaten Gunungkidul dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://gunungkidulkab.bps.go.id/publication/2024/02/28/16727165b49c4287744a4743/kabupaten-gunungkidul-dalam-angka-2024.html>

- [64] Badan Pusat Statistik Kota Yogyakarta, “Kota Yogyakarta dalam Angka 2024,” 2024, diakses September 2024. [Online]. Available: <https://jogjakota.bps.go.id/publication/2024/02/28/6a6d984e3d10d2113c9d3f3b/kota-yogyakarta-dalam-angka-2024.html>
- [65] Badan Pusat Statistik Kabupaten Sleman, “Kabupaten Sleman dalam Angka 2022,” 2022, diakses September 2024. [Online]. Available: <https://slemankab.bps.go.id/publication/2022/02/25/7737c898fa2c5fa7dac8023a/kabupaten-sleman-dalam-angka-2022.html>
- [66] —, “Kabupaten Sleman dalam Angka 2023,” 2023, diakses September 2024. [Online]. Available: <https://slemankab.bps.go.id/publication/2023/02/28/d7689b2f3a1709f8c80cec4a/kabupaten-sleman-dalam-angka-2023.html>
- [67] Badan Pusat Statistik Kabupaten Bantul, “Kabupaten Bantul dalam Angka 2022,” 2022, diakses September 2024. [Online]. Available: <https://bantulkab.bps.go.id/publication/2022/02/25/6a3ad2045a05779aed7eb3a0/kabupaten-bantul-dalam-angka-2022.html>
- [68] —, “Kabupaten Bantul dalam Angka 2023,” 2023, diakses September 2024. [Online]. Available: <https://bantulkab.bps.go.id/publication/2023/02/28/e90ab2b5613a5bd94f524fcb/kabupaten-bantul-dalam-angka-2023.html>
- [69] Badan Pusat Statistik Kabupaten Kulon Progo, “Kabupaten Kulon Progo dalam Angka 2022,” 2022, diakses September 2024. [Online]. Available: <https://kulonprogokab.bps.go.id/publication/2022/02/25/818e21fa047337595988fea4/kabupaten-kulon-progo-dalam-angka-2022.html>
- [70] —, “Kabupaten Kulon Progo dalam Angka 2023,” 2023, diakses September 2024. [Online]. Available: <https://kulonprogokab.bps.go.id/publication/2023/02/28/b41567e6c4d3000c14125547/kabupaten-kulon-progo-dalam-angka-2023.html>
- [71] Badan Pusat Statistik Kabupaten Gunungkidul, “Kabupaten Gunungkidul dalam Angka 2022,” 2022, diakses September 2024. [Online]. Available: <https://gunungkidulkab.bps.go.id/publication/2022/02/25/44a497f80281428732e74d4a/kabupaten-gunungkidul-dalam-angka-2022.html>
- [72] —, “Kabupaten Gunungkidul dalam Angka 2023,” 2023, diakses September 2024. [Online]. Available: <https://gunungkidulkab.bps.go.id/publication/2023/02/28/5250511c0e2626ca301ebd01/kabupaten-gunungkidul-dalam-angka-2023.html>
- [73] Badan Pusat Statistik Kota Yogyakarta, “Kota Yogyakarta dalam Angka 2022,” 2022, diakses September 2024. [Online]. Available: <https://jogjakota.bps.go.id/publication/2022/02/25/8771c64c1a932bd8dc54877c/kota-yogyakarta-dalam-angka-2022.html>
- [74] —, “Kota Yogyakarta dalam Angka 2023,” 2023, diakses September 2024. [Online]. Available: <https://jogjakota.bps.go.id/publication/2023/02/28/9510c8b16be475ce64f99471/kota-yogyakarta-dalam-angka-2023.html>