DAFTAR PUSTAKA

[1] E. A. Oyekanlu *et al.*, "A review of recent advances in automated guided vehicle technologies: Integration challenges and research areas for 5G-based smart manufacturing applications," 2020, *Institute of Electrical and Electronics Engineers Inc.* doi: 10.1109/ACCESS.2020.3035729.

[2] O. Zandi and J. Poshtan, "Fault Diagnosis of Brushless DC Motors Using Built-In Hall Sensors," *IEEE Sens. J.*, vol. 19, no. 18, pp. 8183–8190, 2019, doi: 10.1109/JSEN.2019.2917847.

[3] Z. Li, X. Fan, Q. Kong, J. Liu, and S. Zhang, "Torque Ripple Suppression of BLDCM With Optimal Duty Cycle and Switch State by FCS-MPC," *IEEE Open J. Power Electron.*, vol. 5, pp. 381–391, 2024, doi: 10.1109/OJPEL.2024.3368221.

[4] R. Lajić and P. Matić, "Digital Position Control System With a BLDC Motor Using Field Oriented Control," in *2023 22nd International Symposium INFOTEH-JAHORINA, INFOTEH 2023*, Institute of Electrical and Electronics Engineers Inc., 2023. doi: 10.1109/INFOTEH57020.2023.10094070.

[5] M. Kumar, S. Tiwari, V. Kumar, S. J. Sampathi, and R. Kumar Jarial, "Implementation of Field-Oriented Control (FOC) Algorithm for Brushless DC (BLDC) Motor Speed Regulation," in *2023 2nd IEEE International Conference on Measurement, Instrumentation, Control and Automation, ICMICA 2023*, Institute of Electrical and Electronics Engineers Inc., 2024. doi: 10.1109/ICMICA61068.2024.10732537.

[6] K. P. Immanuel, "Implementasi Simulasi Metode Field Oriented Control (Foc) Untuk Pengaturan Kecepatan Konstan Motor Bldc Pada Beban Statis," *Fak. Tek. Elektro, Univ. Telkom*, vol. 12, no. 5, pp. 7213–7217, 2025.

[7] I. Sholikha, S. D. Nugraha, O. A. Qudsi, E. Purwanto, G. Prabowo, and I. Ferdiansyahi, "Jurnal Pengembangan Elektronika (Pengaturan Kecepatan Motor BLDC Sensorless Menggunakan FOC)," *J. Power Elektron.*, vol. 11, no. 2, pp. 162–167, 2022.

[8] A. D. Putranto, S. . M. S. . Dr. Rini Nur Hasanah, and S. . M. T. s Dr. Tri Nurwati, “Perbandingan Antara Field Oriented Control Menggunakan Sinusoidal Pulse Width Modulation (SPWM) Dan Space Vector Pulse Width Modulation (SVPWM) Dalam Pengendalian Brushless Direct Current Motor (BLDC),” 2021, [Online]. Available: http://repository.ub.ac.id/id/eprint/187545/

[9] N. C. Wei Jian, S. Cao, K. J. Tseng, L. Boon Wee, and S. Yin, “BLDC Motor Zero-Speed Startup Position Sensorless FOC Control,” *2024 IEEE 10th Int. Power Electron. Motion Control Conf. IPEMC 2024 ECCE Asia*, pp. 1282–1287, 2024, doi: 10.1109/IPEMC-ECCEAsia60879.2024.10567746.

[10] R. Sharma, “Implementation of Sensor-less FOC Multi-Motor Control of BLDC for Vehicle Applications,” *2025 Glob. Conf. Inf. Technol. Commun. Networks*, pp. 1–6, 2025, doi: 10.1109/GITCON65266.2025.11376872.

[11] M. Abirami and P. Balakrishnan, “DTC-FOC Hybrid Controller to Control the Speed and Torque of BLDC Motor,” *2023 Innov. Power Adv. Comput. Technol. i-PACT 2023*, no. 1, pp. 1–6, 2023, doi: 10.1109/I-PACT58649.2023.10434633.

[12] R. Pradhana, A. A. Rahman, O. A. Qudsi, and I. Ferdiansyah, “Desain dan Implementasi Pengaturan Kecepatan Motor BLDC Dengan Metode FOC Menggunakan Fuzzy,” *JTT (Jurnal Teknol. Terpadu)*, vol. 11, no. 1, pp. 33–39, 2023, doi: 10.32487/jtt.v11i1.1524.

[13] R. I. Khalil and N. M. Edan, “Real-Time Object Detection for Forklift Automated Guided Vehicles Using Deep Learning,” *Int. J. Transp. Dev. Integr.*, vol. 09, no. 03, pp. 665–676, 2025, doi: 10.18280/ijtdi.090319.

[14] A. Singh, H. Khambhadiya, and A. Dhaneria, “Design and Development of Synchronous Buck Converter for Battery Charging Application Supporting MPPT and CC-CV Mode,” *Proc. 3rd IEEE Int. Conf. Power Electron. Intell. Control Energy Syst. ICPEICES 2024*, pp. 696–700, 2024, doi: 10.1109/ICPEICES62430.2024.10719115.

[15] D. Kusuma, O. Purnamayudhia, S. Subaderi, and K. Hariyanto, “Rancang Bangun

Prototipe Automated Guided Vehicle (AGV) Pada Proses Material Handling Dengan Metode Quality Function Deployment (QFD)," *J. Syst. Eng. Technol. Innov.*, vol. 3, no. 01, pp. 231–244, 2024, doi: 10.38156/jisti.v3i01.75.

[16] P. M. Siva, "Desain dan Implementasi Mekanisme Smart Forklift pada AGV Berbasis Raspberry Pi 4 Model B," *J. Sist. dan Teknol. Inf.*, vol. 9, no. 2, p. 169, 2021, doi: 10.26418/justin.v9i2.43476.

[17] J. Hrbáček, T. Ripel, and J. Krejsa, "Ackermann mobile robot chassis with independent rear wheel drives," *Proc. EPE-PEMC 2010 - 14th Int. Power Electron. Motion Control Conf.*, pp. T5-46-T5-51, 2010, doi: 10.1109/EPEPEMC.2010.5606853.

[18] Ridhani, "Performance Analysis of 2000 Watt Hub Type Bldc Motor on," vol. 7, no. 1, pp. 99–106, 2025, doi: 10.20527/jtamrotary.v7i.

[19] L. Guangdong Changjincheng Tech Co., "DC48V 13 Inch 420W DC BLDC Brushless Wheel Hub Electric Motor for Sanitation Vehicle." Accessed: Sep. 29, 2026. [Online]. Available: https://id.made-in-china.com/co_cjcmotor/product_DC48V-13-Inch-420W-DC-BLDC-Brushless-Wheel-Hub-Electric-Motor-for-Sanitation-Vehicle-Car_ysehsoiiug.html

[20] B. P. Jati and J. P. Hapsari, "ESC Fullbridge 3 Fasa Motor BLDC Berdaya Besar Menggunakan Kontroler Arduino," *Cyclotron*, vol. 5, no. 02, pp. 2–7, 2022, [Online]. Available: http://journal.um-surabaya.ac.id/index.php/cyclotron/article/view/11757%0Ahttp://journal.um-surabaya.ac.id/index.php/cyclotron/article/viewFile/11757/5189

[21] U. Celtekligil and M. Cavdar, "Modeling, Simulation and Analysis of Bipolar Driven BLDC Motor," in *6th International Forum on Research and Technology for Society and Industry, RTSI 2021 - Proceedings*, Institute of Electrical and Electronics Engineers Inc., 2021, pp. 334–339. doi: 10.1109/RTSI50628.2021.9597275.

[22] A. A. Adam, Y. Arifin, B. Mukhlis, A. Kali, and R. Mar'atussolihah, "Kendali

Torka Prediktif Dengan Prediksi Dua Langkah Motor Induksi Yang Dicatu Oleh Sebuah Inverter Tiga Fase," *Foristek*, vol. 14, no. 1, pp. 47–59, 2023, doi: 10.54757/fs.v14i1.255.

[23] D. Mohanraj *et al.*, "A Review of BLDC Motor: State of Art, Advanced Control Techniques, and Applications," *IEEE Access*, vol. 10, pp. 54833–54869, 2022, doi: 10.1109/ACCESS.2022.3175011.

[24] S. Y. Kim, C. Choi, K. Lee, and W. Lee, "An improved rotor position estimation with vector-tracking observer in PMSM drives with low-resolution hall-effect sensors," *IEEE Trans. Ind. Electron.*, vol. 58, no. 9, pp. 4078–4086, Sep. 2011, doi: 10.1109/TIE.2010.2098367.

[25] G. Scelba, G. De Donato, M. Pulvirenti, F. G. Capponi, and G. Scarcella, "Hall-Effect Sensor Fault Detection, Identification, and Compensation in Brushless DC Drives," *IEEE Trans. Ind. Appl.*, vol. 52, no. 2, pp. 1542–1554, Mar. 2016, doi: 10.1109/TIA.2015.2506139.

[26] P. Alaeinovin and J. Jatskevich, "Filtering of hall-sensor signals for improved operation of brushless DC motors," *IEEE Trans. Energy Convers.*, vol. 27, no. 2, pp. 547–549, 2012, doi: 10.1109/TEC.2011.2180171.

[27] ST Microelectronics, "STM32F103xC,STM32F103xD,STM32F103xE," no. July, pp. 1–143, 2018, [Online]. Available: https://www.st.com/resource/en/datasheet/stm32f103ve.pdf

[28] Emanuel Feru, "GitHub BLDC Motor FOC." [Online]. Available: https://github.com/EFeru/bldc-motor-control-FOC

[29] N. S. Manikandan and G. Kaliyaperumal, "Hardware and Software Design for Mobile Robot's Navigation over On-Road and Off-Road Curvature Paths," *IEEE Access*, vol. 11, pp. 89625–89643, 2023, doi: 10.1109/ACCESS.2023.3305678.

[30] "RM0008 Reference manual STM32F101xx, STM32F102xx, STM32F103xx, STM32F105xx and STM32F107xx advanced Arm ®-based 32-bit MCUs STM32F10xxx Cortex ®-M3 programming manual (PM0056) STM32F10xxx

Flash memory programming manual (PM0075) STM32F10xxx XL-density Flash memory programming manual (PM0068),” 2021. [Online]. Available: www.st.com:

[31] F. Briz, D. Díaz-Reigosa, M. W. Degner, P. García, and J. M. Guerrero, “Current sampling and measurement in PWM operated AC drives and power converters,” *2010 Int. Power Electron. Conf. - ECCE Asia -, IPEC 2010*, pp. 2753–2760, 2010, doi: 10.1109/IPEC.2010.5543175.

[32] R. C. Prayogo, A. Triwiyatno, and M. A. Riyadi, “Field Oriented Control Implementation on BLDC Motor Controller with PI and SVPWM using STM32F103C8T6,” *J. Phys. Conf. Ser.*, vol. 2622, no. 1, 2023, doi: 10.1088/1742-6596/2622/1/012025.

[33] M. Nurul Achmadiah, A. anwar Rosyidin, A. Pracoyo, I. Siradjuddin, D. A. Permatasari, and G. Al Azhar, “Desain permodelan dan simulasi Field Oriented Control (FOC) menggunakan motor BLDC,” *J. Elektron. dan Otomasi Ind.*, vol. 10, no. 3, pp. 361–368, 2023, doi: 10.33795/elkolind.v10i3.4416.

[34] A. H. Arif, M. A. Muslim, and E. Yudaingtyas, “Sensorless Field-Oriented Control (FOC) using Sliding Mode Observer for BLDC Motor,” *Kinet. Game Technol. Inf. Syst. Comput. Network, Comput. Electron. Control*, vol. 4, no. 2, 2024, doi: 10.22219/kinetik.v9i2.1937.

[35] K. J. Aström and R. M. . Murray, *Feedback Systems : an Introduction for Scientists and Engineers*. Princeton University Press, 2010.