

Bab 5

Simpulan dan Saran

5.1 Kesimpulan

Kesimpulan yang dapat ditarik dari penelitian Tugas Akhir ini adalah :

1. Modul pengapung yang telah dirancang dengan digunakan susunan pipa PVC 3 inci dengan panjang total 11,2 m yang disusun menjadi 4 bagian yang terdiri dari pipa PVC dengan panjang 0,4 m, 0,6 m, 0,8 m dan 1 m. Modul pengapung yang dirancang dapat menopang beban keseluruhan sistem yaitu modul PPIM dan modul pengapung bergerak dengan beban total hingga 34,82 kg.
2. Modul Pengapung bergerak dapat bergerak dengan kecepatan linier maksimum 0,0909 m/s. Modul pengapung bergerak juga dapat bergerak rotasi 90° dengan durasi minimum 13 detik. Sedangkan sistem Kendali Penggerak Pengapung dapat terhubung secara nirkabel dengan jangkauan maksimum 11 meter.
3. Sistem Penyedia Daya Listrik untuk keseluruhan sistem yang dipilih adalah baterai 12 V dengan kapasitas 18 Ah dan mampu menyuplai daya listrik hingga 7 hari.

5.2 Saran

Beberapa saran yang dapat diberikan untuk pengembangan lebih lanjut yang dapat diterapkan pada "Perancangan Modul Pengapung Bergerak untuk Modul Pemberi

Pakan Ikan Mandiri" adalah :

1. Menambah fitur otomasi pada sistem penggerak pengapung sehingga dapat bergerak ke tengah kolam secara otomatis.
2. Menambahkan fitur untuk mendapat informasi untuk kapasitas baterai dan dapat bergerak ke pinggir kolam ketika kapasitas baterai hampir habis.

Daftar Pustaka

- [1] M. Noor, A. Hussian, M. F. Saaid, M. Ali, and M. Zolkapli, "The design and development of automatic fish feeder system using pic microcontroller," in *2012 IEEE Control and System Graduate Research Colloquium*. IEEE, 2012, pp. 343–347.
- [2] A. Francescutto and A. Papanikolaou, "Buoyancy, stability, and subdivision: from archimedes to solas 2009 and the way ahead," *Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment*, vol. 225, no. 1, pp. 17–32, 2011.
- [3] T. E. of Encyclopaedia Britannica, "Archimedes' principle," <https://www.britannica.com/science/Archimedes-principle>, May 2020, diakses pada 25-4-2022.
- [4] G. Elert, "Buoyancy," <https://physics.info/buoyancy/summary.shtml>, 2021, diakses pada 23-4-2022.
- [5] S. Facts, "Buoyancy," <https://www.sciencefacts.net/buoyancy.html>, 2020, diakses pada 23-4-2022.
- [6] N.-w. Li, C.-p. Ho, K.-l. Yick, and J.-y. Zhou, "Comparison of test methods for measuring the net buoyant force of buoyant materials," *Research Journal of Textile and Apparel*, 2020.
- [7] A. S. Dabit, A. E. Lianto, S. A. Branta, F. B. Laksono, A. R. Prabowo, and N. Muhayat, "Perancangan kapal tanpa awak penebar pakan ikan di wilayah pesisir pantai berbasis microcontroller arduino," *Mekanika: Majalah Ilmiah Mekanika*, vol. 19, no. 2, pp. 74–82, 2020.

- [8] S. P. Sitorus, U. Budiarto, and K. Kiryanto, "Perancangan propeller dan engine propeller matching pada kapal self propelled oil barge (spob) 5000 dwt," *Jurnal Teknik Perkapalan*, vol. 8, no. 4, pp. 563–578, 2020.
- [9] F. I. Pasaribu and M. Reza, "Rancang bangun charging station berbasis arduino menggunakan solar cell 50 wp," *RELE (Rekayasa Elektrikal dan Energi): Jurnal Teknik Elektro*, vol. 3, no. 2, pp. 46–55, 2021.
- [10] D. Sera, R. Teodorescu, and P. Rodriguez, "Pv panel model based on datasheet values," in *2007 IEEE international symposium on industrial electronics*. IEEE, 2007, pp. 2392–2396.
- [11] W. Budiman, N. Hariyanto, and S. SYAHRIAL, "Perancangan dan realisasi sistem pengisian baterai 12 volt 45 ah pada pembangkit listrik tenaga pikohidro di upi bandung," *REKA ELKOMIKA*, vol. 2, no. 1, 2014.
- [12] L. Halim and C. F. Naa, "Desain sistem pendayaan energi listrik pada rumah kaca pintar dengan menggunakan pembangkit listrik tenaga surya," *RESISTOR (elektRONika kEndali telekomunikaSI tenaga liSTrik kOmputeR)*, vol. 2, no. 1, pp. 43–50, 2019.
- [13] M. I. Hlal, V. K. Ramachandaramurthy, A. Sarhan, A. Pouryekta, and U. Subramaniam, "Optimum battery depth of discharge for off-grid solar pv/battery system," *Journal of Energy Storage*, vol. 26, p. 100999, 2019.
- [14] S. Kaushal, B. Bajaj *et al.*, "Marine and land based arduino boat," 2021.
- [15] N. K. Kumar, D. Vigneswari, and C. Rogith, "An effective moisture control based modern irrigation system (mis) with arduino nano," in *2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS)*. IEEE, 2019, pp. 70–72.
- [16] M. A. Risnandar, A. U. Rahayu, and I. Taufiqurrahman, "Analisis konsumsi energi listrik penebar pakan ikan otomatis dengan pemanfaatan tenaga surya," *E-JOINT (Electronica and Electrical Journal Of Innovation Technology)*, vol. 2, no. 2, pp. 77–80, 2021.
- [17] "DC Motor 12VDC, 3700rpm, 0.4A, V775()," <https://vikiwat.com/dc-motor-12vdc-3700rpm-v775m.html>, diakses pada 1-8-2023.

- [18] A. Al-Ramadhan, B. Al-Sahen, M. Ayes, and S. E. Esmaili, "The design of a boat safety and accident prevention system," in *2017 9th IEEE-GCC Conference and Exhibition (GCCCE)*, 2017, pp. 1–6.
- [19] M. A. K. Al Shabibi and S. M. Kesavan, "Iot based smart wheelchair for disabled people," in *2021 International Conference on System, Computation, Automation and Networking (ICSCAN)*. IEEE, 2021, pp. 1–6.
- [20] C. Kurniawan, Z. B. Caniago, A. Aryani, and R. Ekawita, "Rancang bangun pengukuran bawah permukaan air dengan kendali remote control dan komunikasi wireless nrf24l01," *JOURNAL ONLINE OF PHYSICS*, vol. 7, no. 2, pp. 35–39, 2022.
- [21] I. Arifin, M. W. Sari, and P. W. Ciptadi, "Kapal pemungut sampah menggunakan arduino berbasis android," in *Seri Prosiding Seminar Nasional Dinamika Informatika*, vol. 5, no. 1, 2021.
- [22] A. Xing, J. Fang, M. Gao, and C. Zhang, "Design of an unmanned boat system for floating garbage salvage and water quality monitoring based on onenet," in *Journal of Physics: Conference Series*, vol. 1607, no. 1. IOP Publishing, 2020, p. 012062.
- [23] B. Fullerton, "Development of two automated feed buoys for submerged fish aquaculture net-pens," 2007.
- [24] W. Pribadi, Y. Prasetyo, and D. E. Juliando, "Design of fish feeder robot based on arduino-android with fuzzy logic controller," *Int. Res. J. Adv. Eng. Sci*, vol. 5, no. 4, pp. 47–50, 2020.
- [25] P. Whitworth, C. James, and K. I. Matveev, "Construction and testing of small-scale transformable-hull concept boat," in *ASME International Mechanical Engineering Congress and Exposition*, vol. 85611. American Society of Mechanical Engineers, 2021, p. V07AT07A016.
- [26] "Arduino Mega 2560," <https://www.tpcdb.com/product.php?id=2304>, diakses pada 1-8-2023.
- [27] "RS-555 Dc Micro Motor," <https://www.nbleisonmotor.com/RS-555-Dc-Micro-Motor-pd6703204.html>, diakses pada 19-7-2023.

- [28] “Control 28BYJ-48 Stepper Motor with ULN2003 Driver Arduino,” <https://lastminuteengineers.com/28byj48-stepper-motor-arduino-tutorial/>, diakses pada 19-7-2023.
- [29] “DS3231 RTC Module,” <https://components101.com/modules/ds3231-rtc-module-pinout-circuit-datasheet>, diakses pada 19-7-2023.
- [30] “HC-SR04 Datasheet, Equivalent, Ultrasonic Sensor.” <https://datasheetspdf.com/pdf/1380136/ETC/HC-SR04/1>, diakses pada 19-7-2023.
- [31] “ MX25L6406EXCI-12G Datasheet (PDF) - Macronix International,” <https://www.alldatasheet.com/datasheet-pdf/pdf/934243/MCNIX/MX25L6406EXCI-12G.html>, diakses pada 19-7-2023.
- [32] “ The Power Consumption Database : Arduino Uno R3,” <https://www.tpcdb.com/product.php?id=2305>, diakses pada 19-7-2023.