

DAFTAR PUSTAKA

- Alaez, D., Olaz, X., Prieto, M., Villadangos, J., Astrain, J.J., 2022, VTOL UAV digital twin for take-off, hovering and landing in different wind conditions. *Simul. Model. Pract. Theory*, 123, 102703.
- Alaez, D., Olaz, X.; Prieto, M., Porcellinis, P., Villadangos, 2023, J. HIL Flight Simulator for VTOL-UAV Pilot Training Using X-Plane. *Information*, 13, 12.
- Anderson, J.D., 1998, *Aircraft Performance and Design*; Mc-Graw-Hill Education: New York, NY, USA.
- Anjali, B.S., Vivek, A., Nandagopal, J.L., 2016, Simulation and Analysis of Integral LQR Controller for Inner Control Loop Design of a *Fixed wing* Micro Aerial Vehicle (MAV), *Global Colloquium in Recent Advancement and Effectual Researches in Engineering, Science and Technology (RAEREST 2016)*, Procedia Technology 25 (2016) 76 – 83.
- Anonim, 2007, *Aircraft Weight and Balance Handbook*, U.S Department of Transportation, Federal Aviation Administration, Washington, DC, USA,
- Ardema, M.D., 2005, *Newton-Euler Dynamics*, Springer US., [Online]. tersedia di DOI:10.1007/b101082.
- Azman, S., 2018, Design the VTOL Aircraft for Land Surveying Purposes, *Tugas Akhir*; Mechanical Engineering Study Program, Faculty of Mechanical Engineering, University Teknologi Malaysia, Skudai, Malaysia,.
- Belokon, S.A., Derishev, D.S., Zolotukhin, Y.N., 2019, Control of Hybrid Unmanned Aerial Vehicle Motion in Transitional Modes, *Optoelectron.Instrument.Proc*, 55, 346–355.
- Bernard, D.D.C., Riccardi, F., Giurato, M.; Lovera, M., 2017, A dynamic analysis of *ground effect* for a quadrotor platform. *Int. Fed. Autom. Control.*, 50, 10311–10316.
- Cakici, F., Leblebicioglu, M.K., 2016, Control System Design of a Vertical Take-off and Landing *Fixed-Wing* UAV, *International Federation of Automatic Control*, Volume 49, Issue 3, 267-272.
- Carrillo, L.R.G., López, A.E.D., Lozano, R. dan Pégard, C., 2013, *Quad Rotorcraft Control*, Advances in Industrial Control, Michael J. Grimble dan Michael A. Johnson (ed.), Springer London, London., [Online]. tersedia di DOI:10.1007/978-1-4471-4399-4, diakses 30 Maret 2014.
- Cavcar, M., 2000, The International Standart Atmosphere (ISA), Anadolu University, Turkey, 30 (9), 1-6
- Chapman, A.C., Wright, P.G., 1983, *Ground effect vehicle*, US Patent 4,386,801.
- Cheeseman, I., Bennett, W., 1957, The Effect of Ground on a Helicopter Rotor in Forward Flight, *Reports and Memoranda No. 3021*, Aeronautical Research Council London,
- Cobleigh, B.R., 2007, *Ikhana: A NASA UAS Supporting Long Duration Earth Science Missions*; Technical Report NASA TM-2007-214614; NASA Dryden Flight Research Center: Edwards, CA, USA.

- Cuevas, P.S., Heredia, G., Ollero, A., 2017, Characterization of the Aerodynamic *Ground effect* and Its Influence in Multirotor Control, *Int. J. Aerosp. Eng.*, 2017, 1–17.
- Curtiss, J.H.C., Sun, M., Putman, W.F., Hanker, J.E.J., 1984, Rotor aerodynamics in *ground effect* at low advance ratios. *J. Am. Helicopter Soc.*, 29, 48–55.
- Danjun, L., Yan, Z., Zongying, S., Geng, L., 2015, Autonomous landing of quadrotor based on *ground effect* modelling, *Proceedings of the 2015 34th Chinese Control Conference (CCC)*, Hangzhou, China, 28–30 July 2015; pp. 5647–5652.
- Davis, E., Spollard, J., Pounds, P., 2015, Passive height stability and trajectory repeatability of a quadrotor maneuvering in *ground effect* with regulated voltage bus, *Proceedings of the Australasian Conference on Robotics and Automation (ACRA 2015)*, Canberra, Australia, 2–4 December 2015.
- Deng, Z., Guo, Z., Wu, L., You, Y., 2021, Trajectory Planning for Emergency Landing of VTOL Fixed-Wing Unmanned Aerial Vehicles, *Mob. Inf. Syst.*, 2021, 6289822.
- Dewi, P.T., Hadi, G.S., Kusnaedi, M.R., Budiarto, A., & Budiyo, A., 2015, Design of Separate *Lift* and Thrust Hybrid Unmanned Aerial Vehicle, *The Journal of Instrumentation, Automation and Systems*, Vol. 2, No. 2
- Dharmawan, A., Ashari, A., Aprilia, A.G., Handayani, A.M., 2018, Auto VTOL System on Quadrotor Using Madgwick Quaternion Kalman Filter and LQR, *Proceedings of the 2018 4th International Conference on Science and Technology (ICST)*, Yogyakarta, Indonesia, 7–8 August 2018; pp. 1–6.
- Dharmawan, A., Putra, A.E., Tresnayana, I.M., Wicaksono, W.A., 2019, The Obstacle Avoidance System In A Fixed-Wing UAV When Flying Low Using LQR Method. In *Proceedings of the 2019 International Conference on Computer Engineering, Network, and Intelligent Multimedia (CENIM)*, Surabaya, Indonesia, 19–20 November 2019; pp. 1–7.
- Domingues, B.J.M., 2009, *Quadrotor* Prototype, *Tesis*, Instituto Superior Tecnico, Universidade Tecnica de Lisboa.
- Dorf, R.C., Bishop, R.H., 2011, *Modern Control Systems*, 13th Edition, Pearson Prentice Hall, Austin, Texas USA.
- Dundar, O., Bilici, M., Unler, T., 2020, Design and performance analyses of a *fixed wing* battery VTOL UAV, *Int. J. Eng. Sci. Technol.*, 23, 1182–1193.
- Ellingson, G., McLain, T., 2017, ROSplane: Fixed-wing autopilot for education and research, *2017 International Conference on Unmanned Aircraft Systems (ICUAS)*, Miami, FL, USA, pp. 1503-1507, doi: 10.1109/ICUAS.2017.7991397.
- Es, V.G., 2005, Running out of runway: analysis of 35 years of landing overrun accidents. NLR TP 498.
- Fahlstrom, P., Gleason, T., 2012, *Introduction to UAV Systems: Fourth Edition*, United Kingdom : John Wiley & Sons, Ltd
- Fossen, T.I., 2011, *Mathematical Models for Control of Aircraft and Satellites*, 2nd ed, Department of Engineering Cybernetics Norwegian University of Science and Technology, Norway.
- Gallo, M.F., 2013, *Aviation accident final report*, Fatal CEN11FA507, National Transportation Safety Board (2013)

- Gatesy, S., Dial, K., 1992, Tail muscle activity pattern in walking and flying pigeons (*Columba livia*), *J Exp Biol*, 176. 10.1242/jeb.176.1.55.
- Govdeli, Y., Tran, A.T., Kayacan, E., 2019, Multiple Modeling and Fuzzy Switching Control of Fixed-Wing VTOL Tilt-Rotor UAV. In *Fuzzy Techniques: Theory and Applications IFSA/NAFIPS*, 5th ed.; Kearfott, R., Batyrshin, I., Reformat, M., Ceberio, M., Kreinovich, V., Eds.; Springer: Cham, Switzerland, Volume 1000, pp. 270–284.
- Griffiths, D.A., Ananthan, S., Leishman, J.G., 2005, Predictions of rotor performance in *ground effect* using a free-vortex wake model, *J. Am. Helicopter Soc*, 50(4), 302–314.
- Gu, H., Lyu, X., Li, Z., Shen, S., Zhang, F., 2017, Development and experimental verification of a hybrid vertical take-off and landing (VTOL) unmanned aerial vehicle(UAV). *Proceedings of the 2017 International Conference on Unmanned Aircraft Systems (ICUAS)*, Miami, FL, USA, 13–16 June 2017; pp. 160–169.
- Guclu, A., Kurtulus, D.F., Arikan, K.B., 2016, Attitude and Altitude Stabilization of *Fixed wing VTOL Unmanned Air Vehicle*, *AIAA Modeling and Simulation Technologies Conference*, Washington DC. 13-17 June 2016
- Gunarathna, J.K., dan Munasinghe, R., 2018, Development of a Quad-rotor Fixed-wing Hybrid Unmanned Aerial Vehicle, *Proceedings of the Moratuwa Engineering Research Conference (MERCon)*, Moratuwa, Sri Lanka, 30 May–1 June 2018; pp. 72–77.
- Gunarathna, J.K., Munasinghe, R., 2021, Simultaneous Execution of Quad and Plane Flight Modes For Efficient Take-Off of Quad-Plane Unmanned Aerial Vehicles, *Appl. Sci.*, <https://doi.org/10.13140/RG.2.2.16676.19848>.
- Hallion, R.P., 2010, *NASA's Contributions to Aeronautics: Volume 2 Flight Environment Operations Flight Testing And Research*, National Aeronautics and Space Administration Headquarters 300 E St SW Washington, DC 20546
- Hasan, E., Khan, A., Abbasi, A. A. , 2018, Lateral acceleration control of aircraft using PID, linear quadratic regulator (LQR) and linear quadratic integral (LQI); A comparative case study, *2018 5th International Conference on Electrical and Electronic Engineering (ICEEE)*, Istanbul, pp. 173-177.
- Hibbeler, R.C., 2016, *Dynamics*, Pearson Prentice Hall, Hoboken, New Jersey.
- Hudati, I., Effendie, R.A.K., Jazidie, A., 2019, Transition Control on Hybrid Unmanned Aerial Vehicles (UAV) using Altitude Change, *2019 International Seminar on Intelligent Technology and Its Applications (ISITIA)*, Surabaya, Indonesia, pp. 276-281, doi: 10.1109/ISITIA.2019.8937254.
- Isaac, M.S.A., Luna, M.A., Ragab, A.R., Ale Eshagh Khoeini, M.M., Kalra, R., Campoy, P., Flores Peña, P., 2022, Molina, M. Medium-Scale UAVs: A Practical Control System Considering Aerodynamics Analysis. *Drones*, 6, 244. <https://doi.org/10.3390/drones6090244>.
- Jamaludin, M.F., Wahid, M.A., Nasir, M.N.M., Othman, N., 2018, Design and Analysis Performance of *Fixed wing VTOL UAV*, *Jurnal of Transport System Engineering*, Vol 5, No 1
- Jeevan, H.L., Narahari, H.K., Sriram, A.T., 2018, Development of pitch control subsystem of autopilot for a *fixed wing* unmanned aerial vehicle, *Proceedings*

- of the 2018 2nd International Conference on Inventive Systems and Control (ICISC)*, Coimbatore, India, 9–10 January 2018; pp. 1233–1238.
- Jo, D., Kwon, Y., 2017, Analysis of VTOL UAV Propellant Technology, *J. Comput. Commun.*, 5, 76–82.
- Jo, D., Kwon, Y., 2019, Development of Autonomous VTOL UAV for Wide Area Surveillance, *World J. Eng. Technol.*, 7, 227–239.
- Kamal A.M., Ramirez-Serrano A., 2018, Design methodology for hybrid (VTOL + Fixed wing) unmanned aerial vehicles, *Aeron Aero Open Access J*, Vol. 2(3):165-176. DOI: [10.15406/aaaj.2018.02.00047](https://doi.org/10.15406/aaaj.2018.02.00047)
- Kamal, A.M., Ramirez, S.A., 2018, Design methodology for hybrid (VTOL + Fixed wing) unmanned aerial vehicles, *Aeronaut. Aerosp. Open Access J*, 2, 165–176.
- Komissarov, S., Gordon, E., 2010, Soviet and Russian Ekranoplans. Mid- land
- Kreyszig, E., Kreyszig, H. dan Norminton, E.J., 2011, *Advanced Engineering Mathematics*, 10th edisi, John Wiley and Sons, Inc., USA.
- Kulshreshtha, A., Singhal, P., Gupta, S.K., 2020, FEM/CFD analysis of wings at different angle of attack, *Materials Today: Proceedings*, DOI: [10.1016/j.matpr.2020.02.342](https://doi.org/10.1016/j.matpr.2020.02.342).
- Kumar, K.K.S., Arya, H., Joshi, A., 2019, Automatic Control of Harrier Maneuver of an Agile Fixed-Wing UAV, *Proceedings of the 2019 Fifth Indian Control Conference (ICC)*, New Delhi, India, 9–11 January 2019; pp. 136–14.
- Lavretsky, E. dan Wise, K. (2013) *Robust and Adaptive Control*. London, springer. tersedia di doi:[10.1007/978-1-4471-4396-3](https://doi.org/10.1007/978-1-4471-4396-3).
- Lee, T., Leoky, M., McClamroch, N.H., 2010, Geometric Tracking Control of a Quadrotor UAV on SE (3), *49th IEEE Conference on Decision and Control (CDC)*, Atlanta, GA, USA, 2010, pp. 5420-5425, doi: [10.1109/CDC.2010.5717652](https://doi.org/10.1109/CDC.2010.5717652).
- Lee, T.E., Leishman, J.G., Ramasamy, M., 2010, Fluid dynamics of interacting blade tip vortices with a ground plane, *J. Am. Helicopter Soc*, 55, 2200500–2200516.
- Liang, C., Cai, C., 2017, Modeling of a rotor/fixed-wing hybrid unmanned aerial vehicle, *2017 36th Chinese Control Conference (CCC)*, Dalian, pp. 11431-11436.
- Logan, M., Chu, J., Motter, M., Carter, D., Ol, M., Zeune, C., 2007, Small UAV research and evolution in long endurance electric powered vehicles, *Proceedings of the AIAA Infotech at Aerospace Conference and Exhibit*, Rohnert Park, NV, USA, 7–10 May 2007.
- Madgwick, S.O.H., Harrison, A.J.L. dan Vaidyanathan, R., 2011, Estimation of IMU and MARG orientation using a gradient descent algorithm, *2011 IEEE International Conference on Rehabilitation Robotics*, [Online], Juni 2011 IEEE., hal. 1–7, tersedia di DOI:[10.1109/ICORR.2011.5975346](https://doi.org/10.1109/ICORR.2011.5975346).
- Marques, P., Da Ronch, A., 2016, *Advanced UAV Aerodynamics, Flight Stability and Control: Novel Concepts, Theory and Applications*, DOI: [10.1002/9781118928691](https://doi.org/10.1002/9781118928691).

- McCord, C.J., Queralta, T.P., Gia, N., Westerlund, T., 2019, Distributed Progressive Formation Control for Multi-Agent Systems: 2D and 3D deployment of UAVs in ROS/Gazebo with RotorS, *2019 European Conference on Mobile Robots (ECMR)*, Prague, Czech Republic, pp. 1-6, doi: 10.1109/ECMR.2019.8870934.
- Meyer, J., Sendobry, A., Kohlbrecher, S., Klingauf, U., von Stryk, O., 2012, Comprehensive Simulation of Quadrotor UAVs Using ROS and Gazebo, *Proceedings of the Third International Simulation, Modeling, and Programming for Autonomous Robots*, Tsukuba, Japan, 5–8 November 2012; pp. 400–411.
- Myint, C.Z., Tun, H.M., Naing, Z.M., 2017, Development Of Linear Quadratic Regulator Design For Small UAV System, *International Journal Of Scientific & Technology Research Volume 5*, Issue 07, Issn 2277-8616
- Nasiri, S., Lin, S., Sachs, D. dan Jiang, J., 2010, Motion Processing: The Next Breakthrough Function in Handsets, *InvenSense Inc., July 2009*, [Online] tersedia di <http://www.digikey.com/>, diakses 10 Oktober 2014.
- Nelissen, L.P.M., 2021, Development of Gazebo-Based High-Fidelity Simulation Environment for Morphing-Wing Uavs, *Laporan Tesis*, University of Twente, Enschede, The Netherlands, December 2021.
- Nugroho, G., Zuliardiansyah, G., Rasyiddin, A.A., 2022, Performance Analysis of Empennage Configurations on a Surveillance and Monitoring Mission of a VTOL-Plane UAV Using a Computational Fluid Dynamics Simulation, *Aerospace*, 9, 208.
- Ogata, K., 2010, *Modern Control Engineering (Fifth Edition)*, Prentice Hall, New Jersey, USA.
- Pan, K., Chen, Y., Wang, Z., Wu, H., Cheng, L., 2018, Quadrotor Control based on Self-Tuning LQR, *Proceedings of the 2018 37th Chinese Control Conference (CCC)*, Wuhan, China, 25–27 July 2019; pp. 9974–9979.
- Powers, C., Mellinger, D., Kushleyev, A., Kothmann, B., Kumar, V., 2013, Influence of aerodynamics and proximity effects in quadrotor flight, *Experimental Robotics*, Springer, pp. 289–302
- Prouty, R.W., 2002, *Helicopter Kinerjance, Stability, and Control*, 2002 edisi, Krieger Pub Co.
- Pulla, D.P., 2006, A study of helicopter aerodynamics in *ground effect*, *Ph.D. thesis*, The Ohio State University
- Qin, Y.H., Zhu, Q.H., Shao, S., 2015, Aerodynamic characteristics analysis for hovering coaxial rotors in *ground effect*, *J. Nanjing Univ. Aeronaut, Astronaut*, 47, 266–274.
- Rayner, B.C., 2016, *Aviation Accident Final Report*, Non-fatal ERA16CA160, National Transportation Safety Board
- Reza, M., Khoygani, R., Hajighasemi, S. dan Sanaei, D., 2013, Designing and Simulation for Vertical Moving Control of UAV System using PID , LQR and Fuzzy logic, *International Journal of Electrical and Computer Engineering (IJECE)*, 3 (x)

- Sadraey, M., 2012, *Aircraft Design: A Systems Engineering Approach*, Wiley Publications.
- Saeed, A.S., Younes, A.B., Cai, C., Cai, G., 2018, A survey of hybrid Unmanned Aerial Vehicles, *Prog. Aerosp. Sci.*, 98, 91–105.
- Saengphet, W., Thumthae, C., 2016, Conceptual Design of *Fixed wing*-VTOL UAV for AED Transport, *Proceedings of the 7th TSME International Conference on Mechanical Engineering*, Chiang Mai, Thailand, 13–16 December 2016.
- Savero, M.A., dan Dharmawan, A., 2022, Kendali Stabilisasi Pesawat Tanpa Awak Sayap Tetap untuk Pendaratan Otomatis Menggunakan Fuzzy, *Indonesian Journal of Electronics and Instrumentation Systems (IJEIS)*, 12 (2), pp. 181–190
- Sciortino, C., Fagiolini, A., 2018, ROS/Gazebo-Based Simulation of Quadcopter Aircrafts, *Proceedings of the 2018 IEEE 4th International Forum on Research and Technology for Society and Industry (RTSI)*, Palermo, Italy, 10–13 September 2018; pp. 1–6.
- Sharf, I., Nahon, M., Harmat, A., Khan, W., Michini, M., Speal, N., Trentini, M., Tsadok, T., Wang, T., 2014, *Ground effect* experiments and model validation with Draganflyer X8 rotorcraft, *Proceedings of the 2014 International Conference on Unmanned Aircraft Systems (ICUAS)*, Orlando, FL, USA, 27–30 May 2014; pp. 1158–1166.
- Sharf, I., Nahon, M., Harmat, A., Khan, W., Michini, M., Speal, N., Trentini, M., Tsadok, T., Wang, T., 2014, *Ground effect* experiments and model validation with draganflyer x8 rotorcraft, *2014 International Conference on Unmanned Aircraft Systems (ICUAS)*, pp. 1158–1166.
- Shehzad, M.F., Bilal, A., Ahmad, H., 2019, Position & Attitude Control of an Aerial Robot (Quadrotor) With Intelligent PID and State feedback LQR Controller: A Comparative Approach, *Proceedings of the 2019 16th International Bhurban Conference on Applied Sciences and Technology (IBCAST)*, Islamabad, Pakistan, 8–12 January 2019; pp. 340–346.
- Sorensen, T., 2016, *Aviation Accident Final Report*, Non-fatal CEN16LA039, National Transportation Safety Board
- Stahl, S., Seren, S., Rößler, C., Hornung, M., 2018, Development and Performance Comparison of Optimized Electric *Fixed-Wing* VTOL Configurations, *31st Congress of the International Council of the Aeronautical Sciences*, Belo Horizonte, Brazil
- Staufenbiel, R., Schlichting, U.J., 1988, Stability of Airplanes In *Ground effect*, *J. Aircr.*, 25(4), 289–294
- Tanabe, Y., Sugawara, H., Sunada, S., Yonezawa, K., & Tokutake, H. (2021). Quadrotor Drone Hovering in *Ground effect*. *J. Robotics Mechatronics*, 33, 339–347.
- Tanner, P., Overmeyer, A., Jenkins, L., Yao, C.S., Bartram, S., 2015, Experimental investigation of rotorcraft outwash in *ground effect*, *Proceedings of the 71th Annual Forum of the American Helicopter Society*, Virginia Beach, Virginia, 5–7 May 2015; pp. 1–26.
- Tielin, M., Chuanguang, Y., Wenbiao, G., Zihan, X., Qinling, Z., Xiaou, Z., 2017, Analysis of technical characteristics of fixed-wing VTOL UAV. In

- Proceedings of the IEEE International Conference on Unmanned Systems (ICUS), Beijing, China, 27–29 October 2017; pp. 293–297.
- Tun, H., 2016, Analysis of Time Delay Control System for Unmanned Aerial Vehicle, *International Journal of Soft Computing and Artificial Intelligence*, 4. 37-40.
- Volkov, V.V., Strunin, A.M., Kirin, D.V., Kolokutin, G.E., Strunin, M.A., 2022, Investigation of Wind Shear Structure and Turbulence Characteristics In a Warm Front Cloud System Using A Research Aircraft, *IOP Conference Series: Earth and Environmental Science*, 1040 012013
- Wang, W.; Bai, X.; Zheng, L., 2022, PD control of VTOL aircraft trajectory tracking based on double-loop design, *J. Phys. Conf. Ser.*, 2358, 012008.
- Watkins, S., Thompson, M., Loxton, B., Abdulrahim, M., 2010, On Low Altitude Flight through the Atmospheric Boundary Layer. *International Journal of Micro Air Vehicles*, 2(2):55-68, doi:10.1260/1756-8293.2.2.55
- Wei, P., Chan, S., Lee, S., Kong, Z., 2019, Mitigating ground effect on mini quadcopters with model reference adaptive control, *International Journal of Intelligent Robotics and Applications*, 3, doi:10.1007/s41315-019-00098-z.
- Wu, Z., Wu, T.W., 2009, Influence of downwash flow on helicopter airborne missile initial trajectory, *J. Proj. Rocket. Missiles Guid*, 29, 202–204.
- Yang, X., Deng, W., dan Yao, J., Neural Adaptive Dynamic Surface Asymptotic Tracking Control of Hydraulic Manipulators With Guaranteed Transient Performance, *IEEE Transactions on Neural Networks and Learning Systems*, 34 (10), pp. 7339-7349, Oct. 2023, doi: 10.1109/TNNLS.2022.3141463.
- Yu, S., Kwon, Y., 2017, Development of VTOL Drone for Stable Transit Flight, *Journal of Computer and Communications*, 5. 36-43. 10.4236/jcc.2017.57004.
- Zaludin, Z., Gires, E., 2019, Automatic Flight Control Requirements for Transition Flight Phases When Converting Long Endurance *Fixed wing* UAV to VTOL Aircraft, *Proceedings of the 2019 IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS)*, Selangor, Malaysia, 29 June 2019; pp. 273–278.
- Zhang, J., Guo, Z., Wu, L., 2017, Research on control scheme of vertical take-off and landing *fixed-wing* UAV, *2017 2nd Asia-Pacific Conference on Intelligent Robot Systems (ACIRS)*, Wuhan, 2017, pp. 200-204, doi: 10.1109/ACIRS.2017.7986093.
- Zheng, Y., Yang, S., Liu, X., Wang, J., Norton, T., Chen, J., Tan, Y., 2018, The computational fluid dynamic modeling of downwash flow field for a six-rotor UAV, *Front. Agric. Sci. Eng*, 5, 159–167.