Document details

‹ Back to results | ‹ Previous 4 of 345 Next ›

Export Download Print E-mail Save to PDF Add to List More... ›

Full Text View at Publisher

Telkomnika (Telecommunication Computing Electronics and Control) Open Access
Volume 18, Issue 5, October2020, Pages 2674-2681

Development of control system for quadrotor unmanned aerial vehicle using LoRa wireless and GPS tracking (Article) (Open Access)

Gunawan, T.S.[a,b], Yahya, W.A.[a], Sulaeman, E.[c], Kartiwi, M.[d], Janin, Z.[e]

[a]Department of Electrical and Computer Engineering, International Islamic University Malaysia, Malaysia
[b]Fakultas Teknik dan Ilmu Komputer, Universitas Potensi Utama, Indonesia
[c]Department of Mechanical Engineering, International Islamic University Malaysia, Malaysia

View additional affiliations

Abstract

View references (28)

In the past decades, there has been a growing interest in unmanned aerial vehicles (UAVs) for educational, research, business, and military purposes. The most critical data for a flight system is the telemetry data from the GPS and wireless transmitter and also from the gyroscope and accelerometer. The objective of this paper is to develop a control system for UAV using long-range wireless communication and GPS. First, Matlab simulation was conducted to obtain an optimum PID gains controller. Then LoRa wireless was evaluated during clear and rainy days. Static and dynamic points measurement was conducted to validate and optimize GPS accuracy. GeoMapping in Matlab and Google GPS GeoPlanner were then used to analyze the traveled UAV flight path. © 2020 Universitas Ahmad Dahlan.

SciVal Topic Prominence

Topic: Trajectory Tracking | Altitude Control | Vertical Takeoff and Landing

Prominence percentile: 99.708

Author keywords

GPS LoRa PID controller Quadrotor UAV Telemetry data

Funding details

Funding sponsor	Funding number	Acronym
Ministry of Education - Singapore	FRGS19-076-0684	MOE

Funding text

The author would like to express their gratitude to the Malaysian Ministry of Education (MOE), which has provided research funding through the Fundamental Research Grant, FRGS19-076-0684. The authors would also like to thank International Islamic University Malaysia (IIUM), Universitas Potensi Utama, and Universiti Teknologi MARA (UiTM) Shah Alam for providing facilities to support the research work.

ISSN: 16936930
DOI: 10.12928/TELKOMNIKA.v18i5.16716
Source Type: Journal
Document Type: Article
Original language: English
Publisher: Universitas Ahmad Dahlan

References (28)

View in search results format >

All | Export | Print | E-mail | Save to PDF | Create bibliography

1 Norouzi Ghazbi, S., Aghli, Y., Alimohammadi, M., Akbari, A.A.

Quadrotors unmanned aerial vehicles: A review (Open Access)

(2016) *International Journal on Smart Sensing and Intelligent Systems*, 9 (1), pp. 309-333. Cited 57 times.
http://s2is.org/Issues/v9/n1/papers/paper17.pdf
doi: 10.21307/ijssis-2017-872

View at Publisher

2 Finn, R.L., Wright, D.

Unmanned aircraft systems: Surveillance, ethics and privacy in civil applications

(2012) *Computer Law and Security Review*, 28 (2), pp. 184-194. Cited 174 times.
doi: 10.1016/j.clsr.2012.01.005

View at Publisher

3 Kim, H., Ben-Othman, J.

A Collision-Free Surveillance System Using Smart UAVs in Multi Domain IoT

(2018) *IEEE Communications Letters*, 22 (12), art. no. 8489962, pp. 2587-2590. Cited 23 times.
doi: 10.1109/LCOMM.2018.2875477

View at Publisher

4 Silvagni, M., Tonoli, A., Zenerino, E., Chiaberge, M.

Multipurpose UAV for search and rescue operations in mountain avalanche events (Open Access)

(2017) *Geomatics, Natural Hazards and Risk*, 8 (1), pp. 18-33. Cited 75 times.
http://www.tandfonline.com/toc/tgnh20/current
doi: 10.1080/19475705.2016.1238852

View at Publisher

5 Qi, J., Song, D., Shang, H., Wang, N., Hua, C., Wu, C., Qi, X., (...), Han, J.

Search and Rescue Rotary-Wing UAV and Its Application to the Lushan Ms 7.0 Earthquake

(2016) *Journal of Field Robotics*, 33 (3), pp. 290-321. Cited 57 times.
http://www.interscience.wiley.com/jpages/1556-4959
doi: 10.1002/rob.21615

View at Publisher

6 Hossein Motlagh, N., Taleb, T., Arouk, O.

Low-Altitude Unmanned Aerial Vehicles-Based Internet of Things Services: Comprehensive Survey and Future Perspectives

(2016) *IEEE Internet of Things Journal*, 3 (6), art. no. 7572034, pp. 899-922. Cited 285 times.
http://ieeexplore.ieee.org/servlet/opac?punumber=6488907
doi: 10.1109/JIOT.2016.2612119

View at Publisher

7 Kanellakis, C., Nikolakopoulos, G.
Survey on Computer Vision for UAVs: Current Developments and Trends (Open Access)

(2017) *Journal of Intelligent and Robotic Systems: Theory and Applications*, 87 (1), pp. 141-168. Cited 113 times.
www.kluweronline.com/issn/0921-0296/
doi: 10.1007/s10846-017-0483-z

View at Publisher

8 Puri, V., Nayyar, A., Raja, L.
Agriculture drones: A modern breakthrough in precision agriculture
(2017) *Journal of Statistics and Management Systems*, 20 (4), pp. 507-518. Cited 46 times.

9 Mogili, U.R., Deepak, B.B.V.L.
Review on Application of Drone Systems in Precision Agriculture (Open Access)

(2018) *Procedia Computer Science*, 133, pp. 502-509. Cited 83 times.
http://www.sciencedirect.com/science/journal/18770509
doi: 10.1016/j.procs.2018.07.063

View at Publisher

10 Liu, P., Chen, A.Y., Huang, Y.-N., Han, J.-Y., Lai, J.-S., Kang, S.-C., Wu, T.-H., (...), Tsai, M.-H.
A review of rotorcraft unmanned aerial vehicle (UAV) developments and applications in civil engineering

(2014) *Smart Structures and Systems*, 13 (6), pp. 1065-1094. Cited 136 times.
http://technopress.kaist.ac.kr/download.php?journal=sss&volume=13&num=6&ordernum=10
doi: 10.12989/sss.2014.13.6.1065

View at Publisher

11 Bouabdallah, S., Siegwart, R.
Full control of a quadrotor

(2007) *IEEE International Conference on Intelligent Robots and Systems*, art. no. 4399042, pp. 153-158. Cited 571 times.
ISBN: 1424409128; 978-142440912-9
doi: 10.1109/IROS.2007.4399042

View at Publisher

12 Salih, A.L., Moghavvemi, M., Mohamed, H.A.F., Gaeid, K.S.
Modelling and PID controller design for a quadrotor unmanned air vehicle

(2010) *2010 IEEE International Conference on Automation, Quality and Testing, Robotics, AQTR 2010 - Proceedings*, 1, art. no. 5520914, pp. 74-78. Cited 163 times.
ISBN: 978-142446725-9
doi: 10.1109/AQTR.2010.5520914

View at Publisher

13 Chen, F., Jiang, R., Zhang, K., Jiang, B., Tao, G.

Robust Backstepping Sliding-Mode Control and Observer-Based Fault Estimation for a Quadrotor UAV

(2016) *IEEE Transactions on Industrial Electronics*, 63 (8), art. no. 7448915, pp. 5044-5056. Cited 200 times.
http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5410131
doi: 10.1109/TIE.2016.2552151

View at Publisher

14 Chen, F., Lei, W., Zhang, K., Tao, G., Jiang, B.

A novel nonlinear resilient control for a quadrotor UAV via backstepping control and nonlinear disturbance observer

(2016) *Nonlinear Dynamics*, 85 (2), pp. 1281-1295. Cited 98 times.
doi: 10.1007/s11071-016-2760-y

View at Publisher

15 Xiong, J.-J., Zhang, G.-B.

Global fast dynamic terminal sliding mode control for a quadrotor UAV

(2017) *ISA Transactions*, 66, pp. 233-240. Cited 117 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/524244/description#description
doi: 10.1016/j.isatra.2016.09.019

View at Publisher

16 Mofid, O., Mobayen, S.

Adaptive sliding mode control for finite-time stability of quad-rotor UAVs with parametric uncertainties

(2018) *ISA Transactions*, 72, pp. 1-14. Cited 93 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/524244/description#description
doi: 10.1016/j.isatra.2017.11.010

View at Publisher

17 Dydek, Z.T., Annaswamy, A.M., Lavretsky, E.

Adaptive control of quadrotor UAVs: A design trade study with flight evaluations

(2013) *IEEE Transactions on Control Systems Technology*, 21 (4), art. no. 6220873, pp. 1400-1406. Cited 296 times.
doi: 10.1109/TCST.2012.2200104

View at Publisher

18 Santos, M., López, V., Morata, F.

Intelligent fuzzy controller of a quadrotor

(2010) *Proceedings of 2010 IEEE International Conference on Intelligent Systems and Knowledge Engineering, ISKE 2010*, art. no. 5680812, pp. 141-146. Cited 109 times.
ISBN: 978-142446790-7
doi: 10.1109/ISKE.2010.5680812

View at Publisher

19 Erginer, B., Altuğ, E.
Design and implementation of a hybrid fuzzy logic controller for a quadrotor VTOL vehicle

(2012) *International Journal of Control, Automation and Systems*, 10 (1), pp. 61-70. Cited 82 times.
http://www.springerlink.com/content/121338/
doi: 10.1007/s12555-012-0107-0

View at Publisher

20 Mohd Hairon, A.H., Mansor, H., Gunawan, T.S., Khan, S.
Travel angle control of quanser bench-top helicopter based on Quantitative Feedback Theory technique

(2016) *Indonesian Journal of Electrical Engineering and Computer Science*, 1 (2), pp. 310-318. Cited 4 times.
http://www.iaescore.com/journals/index.php/IJEECS/article/download/252/77
doi: 10.11591/ijeecs.v1.i2.pp310-318

View at Publisher

21 Lin, X., Yu, Y., Sun, C.
Supplementary Reinforcement Learning Controller Designed for Quadrotor UAVs (Open Access)

(2019) *IEEE Access*, 7, art. no. 8651281, pp. 26422-26431. Cited 7 times.
http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=6287639
doi: 10.1109/ACCESS.2019.2901295

View at Publisher

22 Zulu, A., John, S.
A review of control algorithms for autonomous quadrotors
(2014) *Open Journal of Applied Science*, 4, pp. 547-556. Cited 62 times.

23 Trasviña-Moreno, C.A., Blasco, R., Marco, Á., Casas, R., Trasviña-Castro, A.
Unmanned aerial vehicle based wireless sensor network for marine-coastal environment monitoring (Open Access)

(2017) *Sensors (Switzerland)*, 17 (3), art. no. 460. Cited 67 times.
http://www.mdpi.com/1424-8220/17/3/460/pdf
doi: 10.3390/s17030460

View at Publisher

24 Bangura, M.
(2017) *Aerodynamics and Control of Quadrotors*. Cited 11 times.
PhD Thesis, Australian National University

25 (2015) *Waspmote LoRa 868 MHz 915 MHz SX1272 Networking Guide*. Cited 5 times.

26 Gunawan, T.S., Yaldi, I.R.H., Kartiwi, M., Ismail, N., Za'bah, N.F., Mansor, H., Nordin, A.N.
Prototype design of smart home system using internet of things (Open Access)

(2017) *Indonesian Journal of Electrical Engineering and Computer Science*, 7 (1), pp. 107-115. Cited 29 times.
http://www.iaescore.com/journals/index.php/IJEECS/article/download/7996/6935
doi: 10.11591/ijeecs.v7.i1.pp107-115

View at Publisher

27 Gunawan, T.S., Yaldi, I.R.H., Kartiwi, M., Mansor, H.
Performance evaluation of smart home system using internet of things (Open Access)

(2018) *International Journal of Electrical and Computer Engineering*, 8 (1), pp. 400-411. Cited 27 times.
http://www.iaescore.com/journals/index.php/IJECE/article/download/9911/8183
doi: 10.11591/ijece.v8i1.pp400-411

View at Publisher

28 Bresciani, T.
(2008) *Modelling, Identification and Control of a Quadrotor Helicopter*. Cited 311 times.
MSc Thesis, Lund Unversity

Gunawan, T.S.; Department of Electrical and Computer Engineering, International Islamic University Malaysia, Malaysia; email:tsgunawan@iium.edu.my