

# Military Support and Rescue Robot

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**Abstract:** *In this era of a politically unstable world, there is a growing demand for the use of military robots to aid the soldiers to perform perilous missions. This paper focuses on the design and build of a semi-autonomous, unmanned robotic system used for various military and rescue operations. Dangerous tasks such as bomb disposal, enemy territory surveillance, search and rescue can be efficiently carried out by the MSRR, Military Support and Rescue Robot. This reduces the risk of losing the lives of both soldiers and civilians. With the help of live feed from the wireless camera and data analysis of environmental composition by various sensors, of the area under surveillance, the soldiers can better prepare for their missions. Using Arduino and Zigbee technology, the above-mentioned tasks can be achieved. The different sensors and the robotic arm are connected to the Arduino mega which in turn is connected to the Zigbee. Data transmission and receiving are through Zigbee technology. This prototype design overcomes the weakness of the existing models and thus provides better support for military operations.*

**Keywords** Military robot, Semi-Autonomous, Search and Rescue, Pick and Place Arm, Arduino, Zigbee

## REFERENCES

- [1]. Market, M. (2020). Military Robots Market | Size, Share, and Global Market Forecast to 2022 | MarketsandMarkets™. [online] Marketsandmarkets.com. Online source available at: <https://www.marketsandmarkets.com/Market-Reports/military-robots-market-245516013.html> [Accessed 11 Jan. 2020].
- [2]. Armyupress.army.mil. (2020). Pros and Cons of Autonomous Weapons Systems. [online] Available at:
- [3]. <https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2017/Pros-and-Cons-of-Autonomous-Weapons-Systems/> [Accessed 23 Feb. 2020].
- [4]. Kumari, A. (2020). Military Robots Play a Pivotal Role as a Tactical and Operational Tool for Armed Forces. [online] Blog.marketresearch.com. Available at: <https://blog.marketresearch.com/military-robots-play-a-pivotal-role-as-a-tactical-and-operational-tool-for-armed-forces> [Accessed 11 Jan. 2020].
- [5]. Doroodgar, B., Yugang Liu and Nejat, G. (2014). A Learning-Based Semi-Autonomous Controller for Robotic Exploration of Unknown Disaster Scenes While Searching for Victims. IEEE Transactions on Cybernetics, 44(12), pp.2719-2732.
- [6]. Nourbakhsh, I., Sycara, K., Koes, M., Yong, M., Lewis, M. and Burion,
- [7]. S. (2005). Human-Robot Teaming for Search and Rescue. IEEE Pervasive Computing, 4(1), pp.72-78.
- [8]. Niroui, F., Zhang, K., Kashino, Z. and Nejat, G. (2019). Deep Reinforcement Learning Robot for Search and Rescue Applications:

- [9]. Exploration in Unknown Cluttered Environments. IEEE Robotics and Automation Letters, 4(2), pp.610-617.
- [10]. Robots.ieee.org. (2020). BEAR - ROBOTS: Your Guide to the World of Robotics. [online] Available at: <https://robots.ieee.org/robots/bear/> [Accessed 14 Jan. 2020].
- [11]. Wang, Y., Bai, P., Liang, X., Wang, W., Zhang, J. and Fu, Q. (2019). Reconnaissance Mission Conducted by UAV Swarms Based on Distributed PSO Path Planning Algorithms. IEEE Access, 7, pp.105086- 105099.
- [12]. Qin, Z., Dong, C., Li, A., Dai, H., Wu, Q. and Xu, A. (2019). Trajectory Planning for Reconnaissance Mission Based on Fair-Energy UAV's Cooperation. IEEE Access, 7, pp.91120 -91133.
- [13]. S. G. Manyam, D. W. Casbeer, and K. Sundar, "Path planning for cooperative routing of air-ground vehicles," in Proc. Amer. Control Conf. (ACC), Jul. 2016, pp. 4630–4635.
- [14]. Liu, Y., Luo, Z., Liu, Z., Shi, J. and Cheng, G. (2019). Cooperative Routing Problem for Ground Vehicle and Unmanned Aerial Vehicle: The Application on Intelligence, Surveillance, and Reconnaissance Missions. IEEE Access, 7, pp.63504-63518.
- [15]. IFLScience. (2020). Military Test Amphibious Robot Guard Balls. [online] Available at: <https://www.iflscience.com/technology/meet-guardbot-spherical-amphibious-robot/> [Accessed 15 Jan. 2020].
- [16]. U.Zaman, H., Chowdhury, B. and Rezwan, U. (2016). Design, control & performance analysis of Muktibot. In: 2016 IEEE 7th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON). [online] Available at: <https://ieeexplore-ieee-org.ezproxy1.hw.ac.uk/document/7746321> [Accessed 14 Jan. 2020].
- [17]. KNOWLEDGE, G., GK, C. and Singh, H. (2020). Daksha: Country's first Anti-Terror Robot. [online] Jagranjosh.com. Available at: <https://www.jagranjosh.com/general-knowledge/daksha-countrys-first-anti-terror-robot-1574428779-1> [Accessed 15 Jan. 2020].
- [18]. Uy, J. (2020). The Jevit: home-grown Cambodian demining robot saves time and.... [online] AEC News Today. Available at: <https://aecnewstoday.com/2019/the-jevit-home-grown-cambodian-demining-robot-saves-time-and-limbs/> [Accessed 15 Jan. 2020]