Mobile robots for outdoor environment

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Abstract— **Mobile robots became a common tool for a wide range of tasks. The main direction of development in robotics is to increase the autonomy of mobile platforms. To operate in autonomous or semi-autonomous mode, the robot should have sophisticated processing and sensor systems for receiving and analyzing information about environment. In the case of outdoor environment mobile robot meets with additional challenges like bad weather conditions, rough terrain etc. Classical robotic tasks such as navigation, localization, path planning, mapping, object recognition should be solved. There are various trial and competition events for functionality evaluation and comparison of different mobile robots, like ELROB, Eurathlon, Robocross, etc. The RSREU team «Avrora» takes part in these events and has rich experience in field of development and testing of mobile robots, which will be presented and discussed on MECO 2019.**

Keywords- mobile robot, sensor, navigation, localization, Avrora team.

References:

[1] Avrora Team official site. https://www.kb-avrora.ru.
[2] Goll S.A., Korneev V.E., Karabanov S.M., Suvorov D.V., Gololobov G.P., Tarabrin D.Yu. Optionally filling scalable complex of universal DC motor controllers and multisensory converters for mobile robotics. 2015 IEEE International Conference on Industrial Technology (ICIT 2015). pp. 392 – 398.
[3] Goll S.A., Luksha S.S., Leushkin V.S., Borisov A.G. Construction of the local patency map on the data from Velodyne lidar. 5th Mediterranean Conference on Embedded Computing, MECO 2016, pp. 184-187.
[4] Goll S.A., Luksha S.S., Leushkin V.S., Borisov A.G. Unmanned ground vehicle local trajectory planning algorithm. 5th Mediterranean Conference on Embedded Computing, MECO 2016, pp. 317-321.
[5] Goll S.A., Leushkin V.S., Luksha S.S., Borisov A.G. Testing of the System for Estimation of Mobile Robotic Platform Displacements by the Method of a Marker Triangle. 5th Mediterranean Conference on Embedded Computing (MECO 2016). С. 188 – 191.
[6] Goll S.A., Borisov A.G. Automated magnetic field reconstruction stand for mobile robot navigation algorithms debugging which use magnetometer data . 21th International Symposium on Measurement and Control in Robotics, 26-28 September 2018 – International CBRNE Institute, MONS, Belgium, pp. 10–16.
[7] Goll S.A., Zakharova E.A. An active beacon-based tracking system to be used for mobile robot convoying. 21th International Symposium on Measurement and Control in Robotics, 26-28 September 2018 – International CBRNE Institute, MONS, Belgium, pp. 18–24.
[8] Goll S.A., Maximova J.S. Ultrasonic rangefinder with submillimeter resolution as part of the rescue robot's sensor system. 21th International Symposium on Measurement and Control in Robotics, 26-28 September 2018 – International CBRNE Institute, MONS, Belgium, pp. 25–32.

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