AUTOCORRELATION METHOD OF OBJECT RECOGNITION FOR MOBILE ROBOT VISUAL NAVIGATION

Zhen Shufen   borismboris@yandex.ru

Bauman Moscow State Technical University, Moscow, Russian Federation

The article solves the problem of object recognition using cross-correlation performed on the results of calculating the correlation coefficient between the original (reference) image of the object and the current image of the working scene. We analyzed the correlation coefficient behavior for different objects. To reduce the search time for object, we used the compression algorithm and experimentally verified the proposed method of recognition.

References

[1] Zhen' Shufen. Machine vision system for mobile robot navigation. Politekhnicheskiy molodezhnyy zhurnal [Politechnical student journal], 2017, no. 6. Available at: http://ptsj.ru/catalog/menms/robots/109.html.

[2] Tishchenko A.S., Mikhaylov B.B. Algoritm poiska ob'ektov dlya navigatsii mobil'nogo robota v ekstremal'nykh usloviyakh [Objects search algorithm for mobile robot navigation in extremal conditions]. Ekstremal'naya robototekhnika. Mater. XIII nauch.-tekhn. konf. [Extremal robotics. Proc. XIII sci.-tech. conf.]. 15–17 April 2003, Sankt-Petersburg, SPbGTU publ., 2003, pp. 258–264.

[3] D'yakov B.N. Geodeziya. Obshchiy kurs [Geodesy. Main course]. Novosibirsk, Novosibirsk University publ., 1993, 171 p.

[4] Vizil'ter Yu.V., Zheltov S.Yu., Bondarenko A.V., Osokov M.V., Morzhin A.V. Obrabotka i analiz izobrazheniy v zadachakh mashinnogo zreniya [Image processing and analysis in computer vision problems]. Moscow, Fizmatkniga publ., 672 p.

[5] Korn G., Korn T. Spravochnik po matematike (dlya nauchnykh rabotnikov i inzhenerov) [Reference book on mathematics (for scientists and engineers)]. Moscow, Nauka publ., 1974, 832 p.

[6] Lowe D. Object recognition from local scale-in variant features. International Conference on Computer Vision, 1999, vol. 2, pp. 1150–1157.

Zhen Shufen — Master's Degree student, Department of Robotics and Mechatronics, Bauman Moscow State Technical University, Moscow, Russian Federation.

Scientific advisor — B.B. Mikhaylov, Cand. Sc. (Eng.), Assoc. Professor, Department of Robotics and Mechatronics, Bauman Moscow State Technical University, Moscow, Russian Federation.