SLAM and speech recognition*

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Abstract—This paper aims to discuss the usage of ontology speech recognition in the context of SLAM in environmental disasters.

Index Terms—component, formatting, style, styling, insert

I. Introduction

Although SLAM techniques are widely adopted in the robotic community, the usage of SLAM techniques is not limited to robots: a human person may contribute to build a map (and be localized within this map) given that proper information is provided through wearable sensors. For example, the DIONISO project1 foresees the presence of a team of human operators involved in Search & Rescue operations and endowed with wearable laser scanners and Inertial Measurement Units (IMU), to the end of exploring and mapping an unknown environment with the ultimate goal of finding injured persons after an earthquake. The great importance of SLAM algorithms based on wearable sensors is proven in Figure 1, showing the earthquake of magnitude 6.2 that happened at Amatrice, Italy, in 2016. Almost 300 persons were killed in the earthquake, and aerial images taken by drones showed houses and walls collapsed and swathes of the city completely flattened. As the reader may observe, ground robots may have significant problems in finding a path through debris. On the other side, human rescuers equipped with wearable sensors and mapping algorithms may significantly contribute to explore the area in the fastest way as possible, with a significant impact in terms of lives saved. Specifically, using the information provided by wearable sensors, the path of each operator (consisting in a sequence of 2D poses) and the map of the area that the operator has already visited (a 2D grid of empty/occupied spaces) can be estimated: by merging all the local maps generated by different operators, a global map can be built up, and possibly visualized in run-time to the end of improving the rescuing process.

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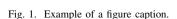
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REFERENCES

- G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955.
- [2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
- [3] I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
- [4] K. Elissa, "Title of paper if known," unpublished.
- [5] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.
- [6] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].
- [7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

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