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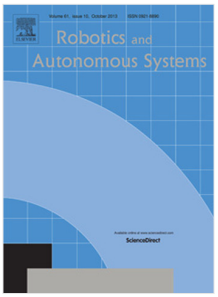

A dataset for human localization and mapping with wearable sensors

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A Dataset for Human Localization and Mapping with Wearable Sensors

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Abstract

The process of acquiring a complete dataset is usually a complex and time-consuming task. This is particularly true when speaking about Simultaneous Localization and Mapping (SLAM) approaches implemented with human operators wearing sensors in outdoor environments, where many problematics arise during the data acquisition. The subject is relatively recent, and there is therefore a limited number of datasets available to the scientific community. The main objective of this article is to describe and analyze a 35-minutes dataset (publicly shared) acquired during the walking process (outdoor, in the city centre of Genova) of a human operator endowed with a laser scanner and two IMUs (accelerometer, gyroscope and compass). The dataset is composed both of the raw data of the sensors and of the online estimated human odometry. Moreover, the path of the operator has been chosen in order to include multiple loops. The dataset has been made available in a format compatible with the ROS (Robots Operating Systems) environment and tested with a popular algorithm for SLAM, usually used for robotic applications, giving some preliminary insights about the basic set of wearable sensors necessary for mapping as well as on the human odometry estimation process.

Keywords: SLAM, datasets, step detection, human odometry

1. Introduction

The Simultaneous Localization and Mapping (SLAM) problem usually refers to the capability of a mobile robot to be placed in an unknown location in an unknown scenario and incrementally build a consistent map of the environment, while simulta-