

The Use of Unmanned Aerial System (UAS) in Improving the Measurement System on the Example of Textile Heaps

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Abstract : The potential of using drones is visible in many areas of logistics, especially in terms of their use for monitoring and control of many processes. The technologies implemented in the last decade concern new possibilities for companies that until now have not even considered them, such as warehouse inventories. Unmanned aerial vehicles are no longer seen as a revolutionary tool for Industry 4.0, but rather as tools in the daily work of factories and logistics operators. The research problem is to develop a method for measuring the weight of goods in a selected link of the clothing supply chain by drones. However, the purpose of this article is to analyze the causes of errors in traditional measurements, and then to identify adverse events related to the use of drones for the inventory of a heap of textiles intended for production purposes. On this basis, it will be possible to develop guidelines to eliminate the causes of these events in the measurement process using drones. In a real environment, work was carried out to determine the volume and weight of textiles, including, among others, weighing a textile sample to determine the average density of the assortment, establishing a local geodetic network, terrestrial laser scanning and photogrammetric raid using an unmanned aerial vehicle. As a result of the analysis of measurement data obtained in the facility, the volume and weight of the assortment and the accuracy of their determination were determined. In this article, this work presents how such heaps are currently being tested, what adverse events occur, indicate and describes the current use of photogrammetric techniques of this type of measurements so far performed by external drones for the inventory of wind farms or construction of the station and compare them with the measurement system of the aforementioned textile heap inside a large-format facility.

Keywords : drones, unmanned aerial system, UAS, indoor system, security, process automation, cost optimization, photogrammetry, risk elimination, industry 4.0

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