

UAV – Flight planning, regulation, processing and applications

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Unmanned aerial vehicle (UAV) systems are nowadays widely used, especially in applications where aerial imaging is an important source of information for performing certain tasks. With the advancement of technology, UAVs have reached an enviable level of practical reliability and functionality that has enabled these systems to enter the geomatics business market as valuable additional platform for collecting spatial information. The use of UAVs enables collection of a large amount of data on a relatively large area and enables faster mobilization to remote areas, emergency response, faster product generation and ability to collect data with multiple sensors. In addition, their use is cost effective and ideal for time-sensitive projects. Based on the collected data, it is possible to create different products such as ortho-photos, contours, topographic models, point clouds, 3D models, digital elevation and surface models and perform different analyses such as classification, slope and volumetric calculation, change detection, vegetation analysis, heat detections and others. The obtained products and analysis can be used for various purposes and improve projects in numerous fields such as agriculture, land survey, environmental studies, civil engineering, humanitarian efforts, real estate and other commercial domains. In order to successfully apply UAV technology for various projects, certain prerequisites are required. One of the main prerequisites is a properly designed flight plan. It is necessary to adequately ensure the correct collection of data during the flight depending on the purpose for which the flight is intended. Today, there are numerous applications for automatic flight planning, but each of them requires to correctly select certain parameters for successful product generation. Also, numerous data processing software have been developed. Most software contains built-in algorithms for obtaining products, and which software with the corresponding algorithm to choose depends on the planned purpose. The software differs from each other in processing algorithms, but also in the hardware requirements that computers must meet to use them. Although the use of UAVs is widely applicable today, there are also certain legislative restrictions for their use. In this presentation, several different applications for flight planning for different purposes will be presented, as well as several software for processing the collected data. A comparison of different application and software solutions will be given, with an assessment related to which software is best to use for a specific application. Also, a brief overview of the legal restrictions on UAV flying and examples of the obtained products for different purposes will be shown.