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Using Structured Analysis and Design Technique Method for Unmanned Aerial Vehicle Components

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Abstract : Introduction: Scientific developments and techniques for the systemic approach generate several names to the systemic approach: systems analysis, systems analysis, structural analysis. The main purpose of these reflections is to find a multi-disciplinary approach which organizes knowledge, creates universal language design and controls complex sets. In fact, system analysis is structured sequentially by steps: the observation of the system by various observers in various aspects, the analysis of interactions and regulatory chains, the modeling that takes into account the evolution of the system, the simulation and the real tests in order to obtain the consensus. Thus the system approach allows two types of analysis according to the structure and the function of the system. The purpose of this paper is to present an application of system analysis of Unmanned Aerial Vehicle (UAV) components in order to represent the architecture of this system. Method: There are various analysis methods which are proposed, in the literature, in to carry out actions of global analysis and different points of view as SADT method (Structured Analysis and Design Technique), Petri Network. The methodology adopted in order to contribute to the system analysis of an Unmanned Aerial Vehicle has been proposed in this paper and it is based on the use of SADT. In fact, we present a functional analysis based on the SADT method of UAV components Body, power supply and platform, computing, sensors, actuators, software, loop principles, flight controls and communications). Results: In this part, we present the application of SADT method for the functional analysis of the UAV components. This SADT model will be composed exclusively of actigrams. It starts with the main function 'To analysis of the UAV components'. Then, this function is broken into sub-functions and this process is developed until the last decomposition level has been reached (levels A1, A2, A3 and A4). Recall that SADT techniques are semi-formal; however, for the same subject, different correct models can be built without having to know with certitude which model is the good or, at least, the best. In fact, this kind of model allows users a sufficient freedom in its construction and so the subjective factor introduces a supplementary dimension for its validation. That is why the validation step on the whole necessitates the confrontation of different points of views. Conclusion: In this paper, we presented an application of system analysis of Unmanned Aerial Vehicle components. In fact, this application of system analysis is based on SADT method (Structured Analysis Design Technique). This functional analysis proved the useful use of SADT method and its ability of describing complex dynamic systems.

Keywords : system analysis, unmanned aerial vehicle, functional analysis, architecture
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