

Image Based Landing Solutions for Large Passenger Aircraft

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Abstract : In commercial aircraft operations, almost half of the accidents happen during approach or landing phases. Automatic guidance and automatic landings have proven to bring significant safety value added for this challenging landing phase. This is why Airbus and ScioTeq have decided to work together to explore the capability of image-based landing solutions as additional landing aids to further expand the possibility to perform automatic approach and landing to runways where the current guiding systems are either not fitted or not optimum. Current systems for automated landing often depend on radio signals provided by airport ground infrastructure on the airport or satellite coverage. In addition, these radio signals may not always be available with the integrity and performance required for safe automatic landing. Being independent from these radio signals would widen the operations possibilities and increase the number of automated landings. Airbus and ScioTeq are joining their expertise in the field of Computer Vision in the European Program called Clean Sky 2 Large Passenger Aircraft, in which they are leading the IMBALS (IMage BAsed Landing Solutions) project. The ultimate goal of this project is to demonstrate, develop, validate and verify a certifiable automatic landing system guiding an airplane during the approach and landing phases based on an onboard camera system capturing images, enabling automatic landing independent from radio signals and without precision instrument for landing. In the frame of this project, ScioTeq is responsible for the development of the Image Processing Platform (IPP), while Airbus is responsible for defining the functional and system requirements as well as the testing and integration of the developed equipment in a Large Passenger Aircraft representative environment. The aim of this paper will be to describe the system as well as the associated methods and tools developed for validation and verification.

Keywords : aircraft landing system, aircraft safety, autoland, avionics system, computer vision, image processing

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