

## **An image processing algorithm for ground navigation of aircraft**

Aircraft taxiing can be challenging in periods of bad weather and pilots tend to face a considerable increase in workload. In order to minimise the impacts of adverse weather such as low visibility conditions, we propose a solution that can automatically navigate aircraft by using image processing techniques to determine its position relative to the taxiway. The output position is intended to provide feedback to a dedicated controller. The task of the image processing algorithm is to identify the taxiway centreline markings by extracting features from the image and processing this information. Afterwards, the detected centreline markings are modelled through curve fitting techniques. The cross-track and heading errors of the aircraft are measured from these curves and these define its position. Results show that the developed algorithm provides the position of the aircraft with centimetric accuracy. The algorithm performs well in various weather conditions including clear, stormy and foggy weather. It also works well during day and night time conditions.