Computer Vision Air Traffic Detection Technologies to Enable UAS Operations in the NAS

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The objective of the Autonomous Optical Collision Detection (AOCD) project is to fill the key technology gaps required to achieve the pilot-equivalent see-and-avoid capability necessary to operate Unmanned Aerial Systems (UAS) in the National Airspace System (NAS). The AOCD team reviewed prior and ongoing research in this area, and found that computer-vision-based detection and tracking of uncooperative aircraft remains a significant hurdle to implementing this capability. Detection of aircraft against noisy backgrounds (e.g. terrain, urban landscapes) is especially challenging. AOCD has thus focused on developing robust algorithms to meet this need. Products of the project include design and implementation of a reference camera system, development of a camera requirements prediction tool, collection of an extensive dataset of in-flight imagery of nearby air traffic, and an initial set of real-time aircraft detection and tracking algorithms with an associated evaluation interface.