

PEGGASUS

Pilot Eye Gaze and Gesture tracking for Avionics Systems using Unobtrusive Solutions



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PILOT EYE GAZE AND GESTURE TRACKING FOR AVIONICS SYSTEMS USING UNOBTRUSIVE SOLUTIONS

The Clean Sky sponsored project PEGGASUS brings avionics experts together to help pilots cope with the increasing complexity of cockpits.

By improving human-machine interaction we can help pilots manage their cognitive workload and maintain a strong situational awareness—keeping everyone safe in the sky.

Using the latest techniques in AI and imaging technology we have created an intelligent system for eye-gaze detection and hand-gesture recognition, dedicated to the cockpit environment.

Key Advances

- User-centric design for pilots developed in collaboration with technical aviation experts.
- Optimized AI algorithms extracting facial features (detection accuracy > 95 % and localization error < 2 mm) using multi-view information and temporal data to improve the system's robustness.
- Edge AI giving real-time (< 16 ms) eye-gaze tracking and gesture recognition for a seamless interaction with the cockpit.

The system is currently under validation on typical aviation use cases with pilot participation.

The potential of this technology is being explored for other professional environments where the user is, at times, under a heavy cognitive workload.



The PEGGASUS system installed in a cockpit demonstrator [C1-5: cameras, I1-4: light sources].



Face detection and facial landmark localization for the five different camera views



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www.csem.ch/peggasus

