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SECOND PRIZE

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Category: **Airborne**

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Research Area 6: **Social Change and Quality of Life**

Idea Number: **6**

Seeing with sound, towards silent aviation

The World Health Organization (WHO) highlighted in their report from 2018 that noise pollution is now Europe's second largest environmental health threat after air pollution. Aircraft noise is one of the main contributors and it causes high annoyance and health issues to the population living near airports. Despite the fact that the noise levels from individual aircraft have considerably decreased in the last decades due to noise-reduction technologies, the ever-increasing demand for flights causes the volume of air traffic to approximately double every 15 years, considerably worsening this situation. This report proposes a novel idea for evaluating and reducing the environmental impact of aviation: the "Aircraft Environmental Impact Monitoring Station" (AEIMS). This station consists of a microphone array capable of performing acoustic imaging (i.e., visualising sound) and an integrated processing unit that provides the noise levels, psycho-acoustic metrics, engine settings and acoustic source maps of aircraft flyovers. These acoustic source maps show the location and the strength of the noise sources on board of an aircraft, and represent the first step towards a sustainable aviation by optimising noise reduction approaches. AEIMS also provide valuable input and databases for developing and updating aircraft noise prediction models. The results obtained by this system are automatically uploaded to a cloud storage service, where they can be accessed publicly. This high-quality device has an approximate prototype cost of 300,000 euro, which could be reduced by using cheaper components or by employing mass-production of this device.

Key Characteristics

Aircraft noise • Aviation environmental impact • Aircraft Environmental • Impact Monitoring Station

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