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Designing a Multi-Sensor Cluster for Monitoring Ventilation Risks Using a Micro Aerial Vehicle (MAV) in Underground Mining

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	X	

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Abstract

The integration of fixed sensors and portable instruments on the same telemetry network enable mines to monitor wider regions and detect airborne hazards more quickly than before. The advent of the micro-unmanned aerial vehicle (MAV) presents an alternative mobile platform for transporting portable air sampling instruments into hazardous environments without endangering mine personnel. Therefore, development of a suitable ventilation sensor cluster is required to enable a MAV to serve as a monitoring platform focused on detecting airborne hazards in underground mining environments. Hence this research was carried out to identify a conceptual design of a ventilation multi-sensor cluster for attachment to a MAV frame. The research applied the systems engineering process (SEP) in a simulated mining environment to conceptualize a suitable design, operational scenarios, and key functionality for the ventilation sensor cluster to be constructed for a MAV.