# System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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**Distributed Architecture for Monitoring Urban Air Quality: A Systems Engineering Approach**

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#### Abstract

The United Nations’ environment program has selected the fight against air pollution as the topic for 2019’s World Environment Day to raise the awareness of the dangers of low quality. In fact, 7 million people worldwide die each year due to diseases associated to low air quality (UN Environment 2019). This briefing summarizes the results of the New Observing Strategies (NOS) project, which was proposed by the Advanced Information System Technology (AIST) program within NASA’s Earth Science Technology Office (ESTO) to support development of a new architecture of global sensing devices for air quality and other earth science challenges. The project goal is to build a multi-resolution, unified picture of air quality using existing and emerging technologies, allowing not only governments, but also scientists and regular citizens to contribute and have access to the information generated. The project brought together NASA scientists and systems engineering students to conduct an initial systems engineering analysis to build a high-level system architecture. The effort helped pave the way for further detailed engineering design and support the development of a test bed for early system verification and validation.

#### Biographies

Adrián Unger spent the last 15 years working in aerospace systems, from rocket avionics architecture to rocket engine test stands and logistics design for experimental launches. Two years ago, he was offered the chance to create a brand new office in charge of the global commercialization and study of new applications for the Argentinian synthetic aperture radar (SAR) constellation (SAOCOM). Today, he is the Head Systems Engineer and Project Manager of this office that is continuously growing.

In 2019, he graduated from Georgia Institute of Technology with a Master´s Degree in Applied Systems Engineering. In 2006, he graduated as an electronic engineer, with automatic control as his field of study, and in 1998, he graduated as a chemistry technician, with biotechnology as his field of study. He also holds a postgraduate degree in Fine Arts. In 2020 he volunteered as the head systems engineer for a discrete electronics COVID19 ventilator.

At present, he spends his time working both as a systems engineer aiming at high positive social impact with the SAOCOM constellation and as a Professor of Space Systems Engineering and Space Avionics Systems at the University of San Martin, located in Buenos Aires, Argentina, where he was born in 1980.