

Bourns College of Engineering Center for Environmental Research and Technology

Onboard Sensing, Analysis, and Reporting (OSAR) Consortium

OSAR will gather academia, industry, and government in partnership to produce transformational engineered systems along with engineering graduates who are adept at innovation and primed for leadership in the global economy. CE-CERT will provide a sustained venue where industry and regulatory agencies can work with faculty and students on resolving long-range challenges, producing the knowledge needed for steady advances in technology and their speedy transition to the marketplace.

ONBOARD SENSING, ANALYSIS, AND REPORTING (OSAR)

Academia, industry, and regulatory agencies now unanimously agree that “in-use” regulations need to evolve to a consistent, fair, and reliable on-board continuous measurement and reporting system. Three main questions embody the challenges and uncertainties surrounding this change:

- (1) Do sensors exist for all emission species, and if not can they instead be modeled?
- (2) Are the sensors accurate and reliable enough for regulatory purposes?
- (3) How will the measurement data be quantified for compliance verification?



WHAT OSAR WILL ACOMPLISH

Next Generation Sensor Development

- Investigate technical development needs such as operating temperature range, crosssensitivities between NO_x and ammonia, performance at a wide range of loads, and overall durability.
- Overcome technical limitations that will make it possible to install sensors aboard every vehicle and revolutionize regulatory strategy and compliance costs.

Data Analysis and Modeling

- Rigorously examine needed elements of the data analysis and modeling structure including:
 - Emission factor reporting algorithms (note that current emission factor algorithms only consider pass-fail criteria of the vehicle under real world conditions).
 - Modeling pollutants for emission species where measurements do not exist.
 - Integrate sensors and reported data analysis into the onboard sensing system and develop a real-time analysis and reporting system using vehicle connectivity acceptable to both the manufacturer, the user, and the regulatory agencies.

Systems Verification

- Prove reliability, accuracy, and efficacy of new systems architecture.

**WE INVITE YOU TO JOIN THE OSAR CONSORTIUM AND PARTAKE IN
CHAMPIONING THE WAY TOWARDS IMPROVED ENVIRONMENTAL QUALITY**



BENEFITS OF MEMBERSHIP

Key benefits to OSAR industry members will include:

- First access to technology and intellectual property
- Access to multidisciplinary innovations via workshops & research reviews
- 1:1 collaborations with faculty, researchers and graduate students
- Branding for company and opportunity to connect with other campuses
- Voting rights to direct consortium research projects

OBJECTIVES

- Generate cutting-edge research and aid in launching start ups
- Cultivate innovation with industry through the intersection of roadmaps and exploration of key questions with the intention of creating cutting edge technology
- Develop a pipeline of Graduate Student Fellowships to create and meet talent industry needs
- Direct policy engagement and education of our future leaders
- Fast track individual research agreements
- Host Visiting Industry Fellows (VIF)

Possible Projects for Year 1 Consortia Research

One of the first objectives of the OSAR Consortium will be to discuss and refine the objectives of the consortium and identify projects of interest to its members. Initial discussions have yielded the following suggestions:

1. Evaluate sensor quality, interferences, ions, velocity, water interferences. Investigate new materials that are resistant to these interferences.
2. Evaluate analytics for quantifying emissions (future regulatory method designed for local fairness). With this approach, traffic management will play a role in reducing emissions and improving GHG.
3. Create a robust modeling system using sensors as the basis, but also on vehicle sensors for a comprehensive model with adaptive elements to preheat based on real activities.

For more information about OSAR Consortium membership, upcoming meetings or for general inquiries, please contact Mike Allen.

OSAR Consortium Team

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Anticipated Industry Sector Participation & Partial List of Invited Companies:

AVL
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California Air Resource Board
*
Cummins
*
Emisense
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Honda
*
Horiba
*
South Coast Air Quality Management District
*
Testo
*
Toyota

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