



Clean
Energy
Research
Centre

Development of **integrated sensors** for environmental and clean technology applications

Abstract:

Alternative fuel sources, such as hydrogen-enriched natural gas (HENG), are highly sought after by governments globally for lowering carbon emissions. Consequently, the recognition of hydrogen as a valuable zero-emission energy carrier has increased, resulting in many countries attempting to enrich natural gas with hydrogen; however, there are rising concerns over the safe use, storage, and transport of H₂ due to its characteristics such as flammability, combustion, and explosivity at low concentrations (4 vol %), requiring highly sensitive and selective sensors for safety monitoring. Our framework detects concentrations of simulated HENG based on time-series data collected from a patent-pending microfluidic-based detector. We have also developed machine learning models for predicting the presence and concentration of NG odorants from the same sensor data. Furthermore, our team is exploring the integration of these sensors with technically reliable membranes that can be used for HENG purification or extraction for onshore or offshore applications.

Dr. Mina Hoorfar

Dean of Engineering and
Computer Science,
Professor,
Mechanical Engineering
University of Victoria



Biograph:

Mina Hoorfar is a Professor and Dean at the Faculty of Engineering and Computer Science at the University of Victoria (UVic) where she leads the Microfluidics and Nanotechnology Laboratory (MiNa Lab). She is known nationally and internationally for her research and innovation in the areas of flow for her research and innovation in the area of flow in microstructures, straddling the fields of fluid mechanics, biochemistry, and fabrication of biosensors and gas sensors. Her multidisciplinary research has resulted in wide and varied applications, such as easier and faster detection of pathogens in drinking water, and air quality monitors in collaboration with industrial partners in oil and gas, municipalities and life sciences sectors.

2023

CERC

Seminar

Date:

January 25

Time:

11:00 AM

Room 202, 2360 East Mall,

Vancouver