



10-203 Donadeo Innovation Centre for Engineering
9211 - 116 Street NW
Edmonton, Alberta, Canada T6G 1H9
Tel: 780.492.3598
Fax: 780.492.2200
www.mece.engineering.ualberta.ca

COVID-19 RESEARCH ACTIVITIES

The COVID-19 pandemic has caused major disruption and uncertainty, and has taken the lives of more than 52,000 worldwide¹. The Department of Mechanical Engineering at the University of Alberta is working with industry partners and government agencies to conduct innovative research to mitigate or prevent the transmission of the virus. Our goal is to make technology contributions to keep Canadians healthy and safe.

- Distinguished Professor Warren Finlay along with Professors Reinhard Vehring, Andrew Martin, and Jason Olfert, are providing design guidance and filtration testing for mass production of high-efficiency made-in-Alberta masks for protection against viral transmission. (**Contact: warren.finlay@ualberta.ca**)
- Professors Lexuan Zhong and Brian Fleck are developing improved HVAC systems to reduce the incidence of human-generated airborne COVID-19 transmission (ACT) in public spaces, reducing morbidity and mortality and minimizing economic impact. Meanwhile, Professor Mahdi Shahbakhti will model building air flow and develop air quality controls to minimize transmission of the virus in department stores. (**Contact: lexuan.zhong@ualberta.ca and mahdi@ualberta.ca**)
- Manufacturing expert, Professor Ahmed Qureshi with robotics expert and Electrical Engineering Professor Mahdi Tavakoli are devising robotic human-machine systems for remote intensive care unit (ICU) operations – enabling medical practitioners to work safely and effectively. (**Contact: ahmed.qureshi@ualberta.ca**)

¹ As of 2 April 2020

- Professor Rafiq Ahmad, a design and manufacturing expert along with Professor Mike Lipsett, reliability and modeling expert, are designing and prototyping personal mechanical respirators for frontline healthcare workers in intensive care facilities. They are using 3D printing, machining, and mass production strategies to fabricate safe, robust, and made-in-Canada respirators. (**Contact: rafiq.ahmad@ualberta.ca and mike.lipsett@ualberta.ca**)
- Meanwhile, Professor Dan Sameoto is developing methods to rapidly reproduce 3D printed masks with high resiliency. Professor Cagri Ayranci can use additive manufacturing, electrospinning and melt electrospinning to fabricate functionalized respirator masks, such as N95. (**Contact: sameoto@ualberta.ca and cayranci@ualberta.ca**)
- MEMS sensory expert Professor Walied Moussa has engaged companies to embed and package sensor technology into 3D printed mobile ventilators – accelerating production of equipment that we desperately need. (**Contact: walied.moussa@ualberta.ca**)
- Sensors and monitoring are needed to identify those in our community who are ill and facilitate physical distancing. Professor Hossein Rouhani and Dr. Rashid Mirzavand are developing wearable wireless sensor systems to enable electronic tracking of physical distancing in hospitals, nursing homes, or the workplace, while allowing healthcare workers to check patients with sensors. (**Contact: hrouhani@ualberta.ca and mirzavan@ualberta.ca**)

We are motivated by our contributions and excited for the next generation of rapid solutions that we are currently developing. We welcome your input and support as we work together to use scientific principles and engineering skills to develop solutions to prevent spread and protect our frontline workers and communities. We invite you to contact us.