LOTUS

Final Report

Student Experience Enhancement Fund (SEEF)

Faculty of Agricultural and Environmental Sciences

Kevin Kelly Vargas – Bioresource Engineering – (kevin.kelly2@mail.mcgill.ca)

Agneev Mukherjee– Bioresource Engineering – (agneev.mukherjee@mail.mcgill.ca)

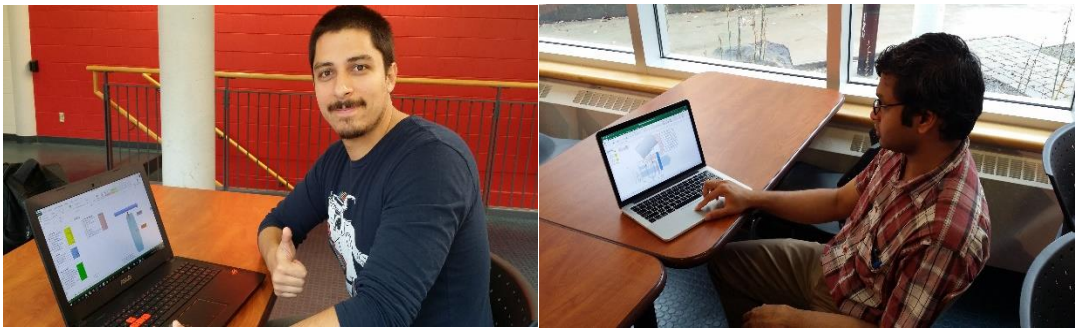
Project Overview

The Lotus project began in April 2017 as the team found an opportunity to focus our independent research efforts by participating in an industry-wide competition – the prestigious XPrize Water Abundance competition. We were the only team (out of 98 teams globally) to represent the Montreal area and McGill. The purpose was simple, “to revolutionize access to fresh water by creating a device that extracts a minimum of **2,000 liters of water per day** from the atmosphere using **100% renewable energy**, at a cost of no more than **2 cents per liter**.”

The entire process has been and continues to be, an incredible out-of-classroom learning experience. It all began with conducting thorough research on the benefits and harms of existing atmospheric water generation technologies and experimenting with numerous moonshot theories which helped us culminate in our final concept. The expertise we developed in classroom, we took it to explore new technologies.

The role of Kevin was to research and develop novel materials, while analyzing their performance in our complete process. Agneev became involved primarily in tackling the different R&D challenges of the project and addressing the cost economics necessary to meet the competition requirements. Kevin and Agneev both drove the project throughout the prototyping, testing, and iterating phases.

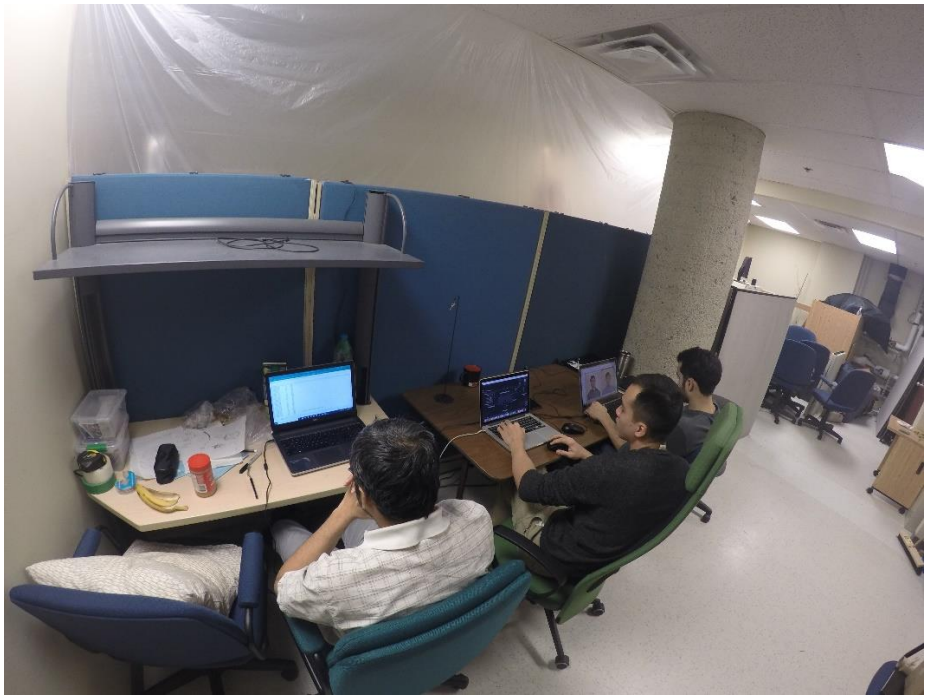
Group Photo of the Lotus Drop Team
From left to right, Tony, Jon, David, Kevin, Peter, Agneev and Pyae.



Kevin and Agneev performing desk research and working hard on theoretical postulation.

Once we felt confident enough with our final design, we set off to create a working prototype and poof-of-concept. We named him ATMOS, and this prototype would perform during the Round 1 testing phase of the XPrize competition. For this testing phase, we set up camp inside a controlled room, were we would run and monitor our machine for 72 hours straight. With some of us having to stay up for more than 40 hours straight, and others on 24-hour on-call shifts for any potential problems, it soon became an incredibly rewarding and unique experience.

Our team, getting prepped and setting up camp to begin the 72-hour testing phase.



Many hours into the testing phase, our machine ATMOS sits inside a closed chamber, where we controlled temperatures and humidities.

ATMOS working hard to produce water. To the right, our pay-off.

After months of hard work, our prototype performed flawlessly during the entire 72-hour testing period, producing water during every second of it. And although we were not fortunate enough to become one of the XPrize finalists, the learning experience has now become priceless, and the endeavour does not end here. We would like to thank McGill's Faculty of Agricultural and Environmental Sciences once again for their support. Thanks for helping us bring our idea to reality!