ENGR 491-513: DEVELOPING A SETUP TO MASS PRODUCE NANOFIBERS WITH APPLICATIONS IN WATER PURIFICATION

Our Grand Challenge

Lack of access to clean water is the cause for more death than wars. According to the National Academy of Engineering, 1 out of every 3 people do not have access to basic sanitation means for which clean water is needed, and about half of that need more clean water than they have access to.

Key challenges:

- Identify and engineer the cross talks between different electric fields in melt electrospinning.
- Reducing the diameter of melt electrospun fibers

Impact to Society

- Scalable manufacturing of nanofibers paves their way into the society for a wide range of applications, including water purification, which is the major focus of this effort.
- Nanofibers, when produced in large quantities, can also be used as the building blocks of multifunctional nanocomposites.

Project Goals

Our goal is to establish an affordable and environmentally friendly approach to make water purification systems (WPS), including the water filter and housing, by combing the merits of 3D printing and melt electrospun processing of nanofibers.

The objectives are: (1) developing a scalable method to produce nanofibers based on melt electrospinning, (2) Study the fabrication of melt electrospun fibers as a function of processing parameters, and (3) study the water purification efficiency of electrospun filters.

Desired Engineering Majors

- Aerospace Engineering
- Mechanical Engineering
- Chemical Engineering
- Electrical Engineering
- Materials Science and Engineering
- Civil Engineering

Faculty Mentors

Mohammad Naraghi (AERO & MSEN)
naraghi@tamu.edu
Micah Green (CHEL & MSEN)