ENGR 491-505: SUPERHYDROPHILIC FILTER PAPER FOR EFFECTIVE OIL RECOVERY FROM OIL CONTAMINATED WASTEWATER

Our Grand Challenge

With the ever-increasing industrial oily wastewater and frequent oil spill accidents from tankers or pipelines, clean water is becoming a rare commodity in the world. Water pollution has now caused severe environmental and ecological damage to human and nature. Oil-water separation is an effective area for water pollution treatment and has already aroused full public concern.

Key challenges:

- Reduce high economic cost and improve low efficiency of the conventional single functional oil-water mesh separators.
- Fabricate different reversible mesh systems and evaluate longtime durability and functionality.

Project Goals

In this project, we will be developing a convenient and controllable reversible smart mesh separator to acquire oil-water separation process. This smart mesh separator should have longtime reversible wettability and can easily transfer from superhydrophobicity to superhydrophilicity, and vice versa.

Impact to Society

2.6 billion people live in areas with threats to water security and more than 3900 children worldwide left us in a day due to unclean water today. Our smart reversible oil-water mesh separator would provide an easy, attractive alternative to selectively separate oil or water and to mitigate pollution from oil contaminated wastewater.

Faculty Mentors

Dr. Zhengdong Cheng (CHEN, MSEN, ENGY)

Desired Engineering Majors

Chemical Engineering, Ocean Engineering, Petroleum Engineering, Mechanical Engineering, Biomedical Engineering, Electrical & Computer Engineering and other engineering