

**Master's Thesis Defense Announcement**  
**Mechanical and Aerospace Engineering Department**  
**University of Texas at Arlington**

**Electroextraction Across Droplet-Droplet Interface**

By

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2 P.M., Wednesday, April 24 2019

Woolf Hall, 413

**Abstract**

Extraction of analytes from solvents is a crucial part of many medical, clinical, industrial and refinery processes. It is required for preconcentration of analytes into other solvents, purification of solvents and detection of harmful or toxic molecules. One of the very important methods of extraction in microfluidics is liquid-liquid extraction (LLE). LLE involves the use of two immiscible liquids for diffusion of analytes across the interface. Recently there has been a growing interest in the coupling of external electric field with LLE to enhance the extraction of charged analytes. This has led to the birth of a new extraction method known as electroextraction. Although electroextraction has been mostly studied in continuous microfluidics, no significant efforts have been made to integrate it with digital microfluidics. As an initiation towards such integration, this thesis addresses the dependence of electroextraction across two stationary immiscible droplets on various factors (voltage, time, etc.). This study will aid the designing of lab-on-chip devices using electrowetting-on-dielectric (EWOD).