

UNDERGRADUATE SUMMER RESEARCH PROGRAM PROPOSAL

- Project title

Investigation of honey-based resistive switching memory for neuromorphic computing

- Faculty advisor

Feng Zhao

- One-paragraph description

Resistive random-access memory (ReRAM) is a promising technology for a new generation of nonvolatile memory devices and neuromorphic computing. A variety of inorganic, organic and natural materials have been studied as the switching materials with promising memory switching behaviors reported. Among these materials, natural organic materials such as honey have emerged, with benefits of environmentally-friendly, biocompatible, and biodegradable. In this project, nonvolatile memory properties of honey thin film as the resistive switching material will be investigated, and memory and synaptic properties will be characterized. By participating in this project, the student will gain hands-on experience in microfabrication processes in our clean room, and electronic device testing. Such knowledge and experience will benefit the student to pursue career path in semiconductor industry in Portland/Vancouver areas, such as TSMC, Intel, ADI, ASML, Linear Technology, etc.

- Deliverables

- 1) Working saccharide nonvolatile memory devices
- 2) A final report summarizing design parameters, microfabrication process, and test results.
- 3) A poster to present results in ENCS Research Showcase.

- Time requirements

- 1) 240 hours
- 2) Flexible Mon-Fri, 8am-5pm, May 16 – Aug 5.

- Constraints

No constraints on the project.

- Required skills and knowledge

Knowledge in memory devices and microfabrication is desirable, but not required since student will learn and get training during the summer research.

- Preferred qualifications

Interest in microelectronics and microfabrication is a must.