

FACULTY MENTOR

Mercier, Patrick

PROJECT TITLE

Ultra-miniaturized power converters for microrobotic applications

PROJECT DESCRIPTION

Microrobotics is an emerging field that will enable new and exciting applications. However, there are many difficult engineering challenges: the overall size of these robots is tiny, and we would like to maximize the battery lifetime. This means we need power converters that can efficiently convert a battery voltage to the high voltages required for actuation of electromechanical drivers (often in the 100s of volts range), all in a very small area. This requires new DC-DC converter topologies to achieve the desired specifications.

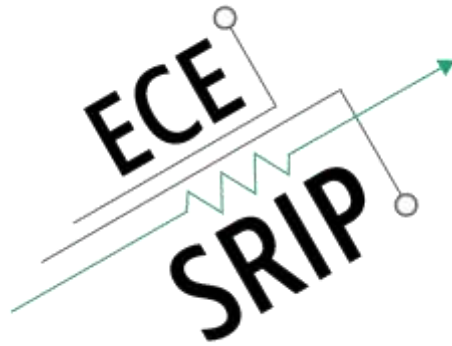
This project can accommodate both remote and in-person students

INTERNS NEEDED

1

PREREQUISITES

Senior level circuit design classes (e.g., at minimum ECE102, ideally ECE164), plus one or more of the power electronics classes is preferred.



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Mercier, Patrick

PROJECT TITLE

Wearable physiochemical sensor technologies

PROJECT DESCRIPTION

We are building wearable microneedle lab-on-skin platforms that can sense physiochemical properties in human tissue in real time. We require research and development of next-generation electronics, software applications, and more.

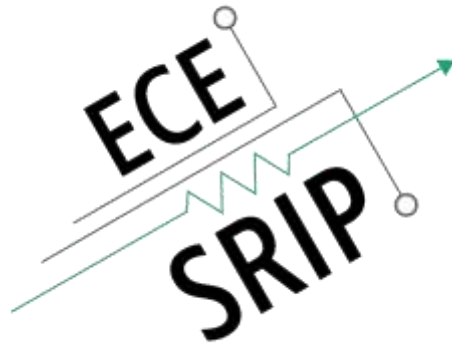
This project can accommodate both remote and in-person students

INTERNS NEEDED

2

PREREQUISITES

One of: PCB design experience, or app design experience (ideally iOS)



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Mercier, Patrick

PROJECT TITLE

Ultra-low-power wireless communication circuits

PROJECT DESCRIPTION

Next-generation IoT devices require ultra-low-power connectivity. Help us design the next-generation of Wi-Fi backscatter systems, Bluetooth Low Energy circuits, NB-IoT systems, and so on.

This project can accommodate both remote and in-person students

INTERNS NEEDED

2

PREREQUISITES

Strongly recommend as many of these courses as possible: ECE265, 166, 164, 166