Internship Projects Proposal @ Venture R&D

## Introduction

Venture is trusted partner for many fortune 500 corporations and leading technology companies. Venture has R&D domain expertise and critical knowhow in various product categories and ecosystems.

If you are a keen and an enthusiastic learner, and eager to work in a real world product development environment to create the next generation Life science equipment , Venture offers you internship opportunities and you can take part in the work ongoing in our R&D department.

Currently we are looking for graduate/undergraduate students with strong academic background and interest in the field of Biomedical, Mechanical, and Electrical and Computer engineering. You will have opportunity to work with the Venture R&D team to work on latest technologies and algorithms driving digital PCR machines to robotic grippers. The different sub projects are listed below

## List of Projects and Scope

## PCR Thermo-cycler development (ME, ECE, 1~2 students)

1. **Project brief**
   1. Develop a high performance thermocycler system used in PCR
2. **Objectives**
   1. To support in the development of a fast ramping thermocycler with specified performance requirements
3. **Scope**
   1. Understand design and modeling of Peltier based thermocycler system
   2. Characterize and identify parametric influences on the performance of the system
4. **Deliverables/Learning Opportunities** 
   1. System thermal modeling using Solidworks flow simulation
   2. Detailed testing and evaluation of development units. Report and recommendations
   3. Modeling of different controller designs like Feedforward, model predictive etc. and comparison with PID
   4. Algorithms and codes for controller design

## Machine learning in Fluorescence imaging (Mechanical, Electrical, Computer science – 1 student)

1. **Project brief**
   1. Fluorescence imaging and characterization
2. **Objectives**
   1. Image capture, analysis and design of algorithms for characterization
   2. Explore and machine learning/deep learning techniques for image characterization
3. **Scope**
   1. Image capture and optics fundamentals
   2. Algorithm and coding for characterization
4. **Deliverables/Learning Opportunities** 
   1. Understanding image acquisition
   2. Understanding Characteristics of different fluorescent images
   3. Image analysis and characterization

## Biomimetic universal gripper design studies (Mechanical/ Robotics – 1 student)

1. **Project brief**
   1. Investigate potential gripper designs and characterize performance
2. **Objectives**
   1. To support in the development of a universal gripper design
3. **Scope**
   1. Understand different types of gripper designs
   2. Support design and proto fabrication of selected gripper designs
   3. Characterize the proto samples against requirements of holding force, accuracy and other gripper parameters
4. **Deliverables/Learning Opportunities**
   1. Work on a design support , Proof of concept set up
   2. Support set up proto system including pneumatics and controllers and measurement system
   3. Support testing of different concepts and characterization

The students can apply the internship via NUS Talent Connect.

Below are the Job posting ID for the respective project.

Project for PCR Thermo-cycler development:

Faculty Internships – Engineering

ID: 46512

Project for Machine learning in Fluorescence imaging:

Faculty Internships – Engineering

ID: 46513