The Department of Mechanical and Materials Engineering is pleased to offer the following research project for the summer of 2016. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE: 3D PRINTING OF SHAPE MEMORY ALLOY

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Project Description

Shape memory alloys (SMA) are “smart” metals that “memorize” their original shape. The deformed SMA returns to the original shape upon heating. SMA has extensive applications in aerospace and biomedical areas. Meanwhile, 3D printing is an advanced manufacturing technology that builds up arbitrarily complicated components by layers. Employing 3D printing to produce functional metal parts has been identified as a major research field, in which the printing of SMAs is very challenging.

In this project, student(s) is required to tackle the challenge. The state-of-the-art equipment at UC-UCRI joint Additive Manufacturing Center will be made available. The research tasks are (1) review literature and develop the suitable NiTi composition for SMA; (2) design experiments for using a metal 3D printer; (3) characterize the NiTi based SMA; (4) develop a technical report, which serves a base for a conference or journal paper. In this process, the mentor or graduate students in the mentor’s team will have a regular meeting (e.g., twice a week) with the student. Training on using the equipment will be provided. We strive to help the student(s) learn the advanced manufacturing technology and material development, and nurture them to gain valuable research experience.