

Date: May 12, 2006  
To: Intel Foundation  
From: Chris Kuryak, University of Texas at Austin  
Re: Undergraduate Research Project Progress Report 1

### Project Overview

The project I will be working on over the next couple of months involves the creation of three-dimensional (3D) objects using microstereolithography ( $\mu$ SL). The overall purpose of  $\mu$ SL is to create complex microstructures for use in micro electro-mechanical systems (MEMS). For example,  $\mu$ SL can produce extremely small springs to be used in microscopic machinery. My project over the next two months is to modify the current  $\mu$ SL system at the University of Texas at Austin as to expand its capabilities in the production of 3D microstructures.

### Work Completed

So far, I have visited the lab in which I will be working and inspected the  $\mu$ SL machine that I will be modifying. I read some of the background information on  $\mu$ SL to ensure I have some knowledge before entering the lab and beginning any experimentation. To sum up how a  $\mu$ SL works, one must think of a normal projection system used in classrooms or in business meetings. The image that is produced from a projector is usually cast upon a screen or wall for easy viewing. In the case of  $\mu$ SL, the image is cast upon a curable resin surface. A UV light is then exposed onto this surface causing the exposed area of the resin to solidify, while the dark area remains a liquid. This process is performed several times on top of itself to create a 3D object. The following image shows the overall setup of a  $\mu$ SL system.

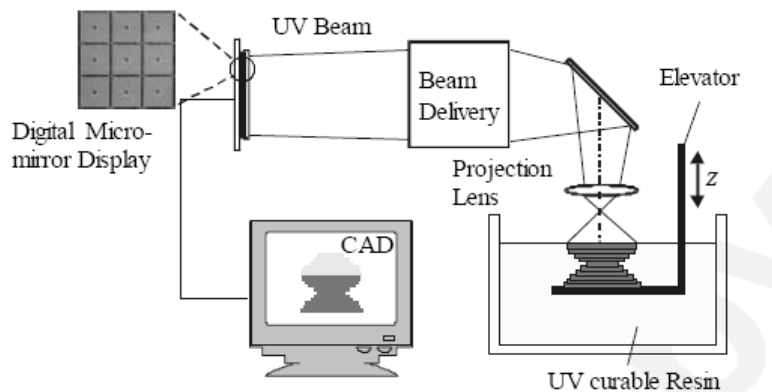


Figure 1. Cheng Sun, et. al., "Projection Microstereolithography Using Digital Micro-mirror Dynamic Mask", *Sensors and Actuators A*

### Current Work

Currently, I am finishing my research on the background of  $\mu$ SL and how the system works. I will meet with my graduate advisor more often this month to begin my manipulation of the  $\mu$ SL system. Hopefully I will obtain significant results by the end of the month.

### Schedule For Next Month

1. Finish the research and experimentation on modifying the  $\mu$ SL system
2. Create a poster summarizing the work I have performed and the results I have found
3. Present my results to the appropriate personnel

### Current Thoughts on the Project

I am excited to be working on this project. This is an area of engineering that I feel will be very important in the future. I am sure there is knowledge I can give to this project as well as take away from it.