CHEMISTRY Departmental Seminar

Fall 2018
CHEM 285/191 Schedule
Tuesdays at 4:30-5:45PM
Room Duncan Hall 250

September 25th, 2018

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Carbon, Inc
and
University of North Carolina at Chapel Hill
and
North Carolina State University

Digital Light Synthesis to Drive Manufacturing:
Convergence of Hardware, Software and Molecular Science

In many ways, manufacturing processes define what’s possible in society. The opportunities to make things that can improve the health and well being of society are central to our interests to develop scalable methods that can make complex structures more economically than in the past. This lecture will describe a new advance in additive manufacturing, referred to as Digital Light Synthesis, that is rapid, uses materials that have the requisite properties to yield final parts and is economically competitive. Our approach promises to advance industry beyond basic prototyping, which is what 3D printing has primarily been limited to, to truly enable 3D manufacturing. Digital Light Synthesis (DLS) harnesses light and oxygen to grow objects from a pool of resin instead of printing them layer-by-layer. DLS capitalizes on the fundamental principle of oxygen inhibited photopolymerization to generate a continual liquid-interface of uncured resin between the growing part and the exposure window. The DLS technology raises the state-of-the-art in additive manufacturing in three ways:

- **GAME-CHANGING SPEED:** 25-100 times faster than conventional 3D printing
- **COMMERCIAL QUALITY:** produces objects with consistent mechanical properties
- **MATERIAL CHOICE:** enables a broad range of polymeric materials

The combination of performance and speed has enabled many important use cases to emerge including large scale manufacture of mass-customized running shoes by Adidas (FutureCraft 4D) and numerous parts in the automotive, consumer electronics, aerospace and medical fields.

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Revised 08/17/2018