CERE
Center for Energy Resources Engineering

CERE - SEMINAR

Thursday 15 February 2024
09:15 to 10:30 a.m.
Building 229, Room 003
(Light breakfast is served from 9:00, please bring your own coffee/tea)
Online from link in calendar invitation

"TomoPrint - A Video Generator for 3D Tomographic Volumetric Printing"

By

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Abstract
The landscape of 3D printing technology is experiencing a paradigm shift, with the advent of tomographic volumetric printing (TVP), a technique that stands in stark contrast to the traditional layer-by-layer approach. This talk will introduce "TomoPrint," a pioneering software specifically developed to harness and optimize the capabilities of TVP.

Traditional layer-by-layer 3D printing, while revolutionary, faces some significant challenges and limitations. The printing duration scales with the size and complexity of the 3D models, leading to longer production times for larger or more intricate designs. Additionally, this method often results in printed workpieces with a 'stair-stepping' appearance, reflecting the layered nature of the construction process. In contrast, TVP redefines these boundaries. It operates independently of the object's size or complexity, facilitating the swift production of detailed designs in a fraction of the time. This rapid manufacturing process not only accelerates production but also delivers products with remarkably smooth surfaces, devoid of the characteristic layer-by-layer textural imprints.

Nevertheless, the widespread adoption of TVP has been limited due to the absence of a dedicated software solution that can efficiently manage its complex computational requirements. Addressing this gap, we have developed TomoPrint, a software specifically designed to unleash the full potential of TVP. At the core of TomoPrint is a real-time, physics-based ray tracer, empowered by GPU acceleration, drastically reducing the rendering time, and expediting the process well beyond the capabilities of current methodologies. The software also excels in system integration ensuring seamless coordination between the various components such as the projector(s), rotation stage, and the camera, centralizing control and paving the way for sophisticated feedback mechanisms and scalability in the printing process.

This seminar will delve into the technical nuances of TomoPrint, explore its transformative impact on TVP, and discuss its potential to redefine manufacturing standards by facilitating precision, speed, and versatility in 3D printing.