

Undergraduate Research in Advanced Manufacturing

MEASURING THE SUSTAINABILITY PERFORMANCE OF HYBRID MANUFACTURING PROCESSES

Advancements in Hybrid Manufacturing

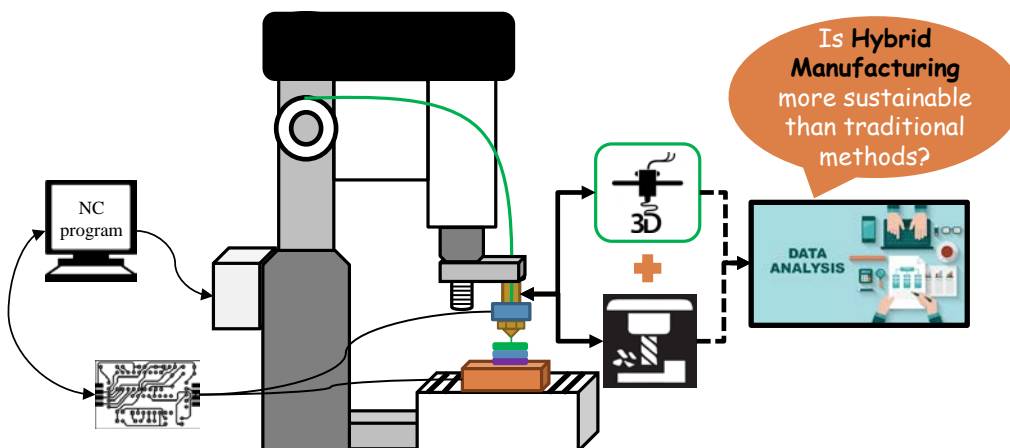
- Current advancements in the rapidly emerging field of **3D printing**, or additive manufacturing (AM), include hybrid processes, which combine both additive and subtractive manufacturing operations.
- Hybrid manufacturing process development strives to leverage the individual benefits of both operations – with a goal of enabling **efficient production** through reduced time-to-market, lower production costs, and shorter manufacturing process chains.
- The **hybrid manufacturing process** used in this research combines fused deposition modeling (FDM) - an additive process - and CNC milling - a subtractive process - to improve AM part surface finish.

Research Goal

The goal of this research is to evaluate **sustainability performance** of a hybrid manufacturing system through **experimental analysis**.

Research Tasks

Assist in designing and conducting experiments using a variety of additive, subtractive, and lab-scale hybrid manufacturing process equipment
Measure and analyze surface roughness, build time, and energy use
Evaluate the effect of various process parameters on functional and sustainability performance measures



Hybrid Manufacturing Process in the OSU Industrial Sustainability Lab

Majors

- Industrial, manufacturing, mechanical engineering
- Other engineering majors

Grade level

- Junior and senior students
- Other levels considered

Desired Skills

- CAD/CAM
- Data analysis
- MS office

Interests

- Sustainable manufacturing
- 3D printing & CNC machining
- Experimental design/analysis

Benefits

- Hands on lab experience
- Exposure to graduate research

Contact

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