

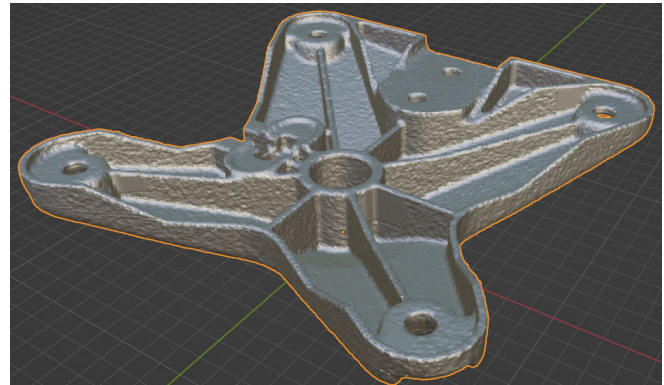
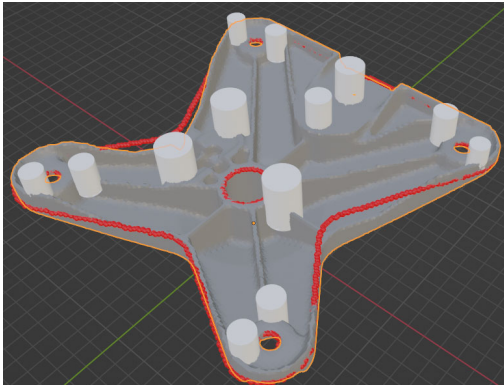


Summary: Unexpected process and manufacturing challenges can delay production and delivery of quality castings to the Defense Logistics Agency (DLA) / Department of Defense (DoD). Under AMC's Innovative Casting Technologies (ICT) program, the University of Alabama (UA), coordinating with the Steel Founders' Society of America (SFSA), acted on an opportunity to enhance net-shape casting manufacturing by identifying manufacturing routes, improving production speed, quality, and cost-efficiency. UA also developed a visualization method for cost estimation in metalcasting. The project contributes to efficient manufacturing processes, benefiting the DLA in estimating costs for legacy weapon systems' spare parts.

SUCCESS STORY

Problem: At times, casting suppliers are unable to deliver net-shape casting components with desired quality due to process complexity and manufacturing difficulties.

Solution: Under AMC's ICT program, UA created an open-source geometry analysis approach with distance transformation and watershed algorithms to optimize the manufacturing process for castings and estimate variable costs. Using this methodology, UA developed open-source software for manufacturability analysis.



A method for predicting and visualizing real metal casting part quality and costs

Benefits for DLA / DoD

- Methodology to evaluate cost realism of bids
- Reduced part costs and lead times through improved production design and process

Benefits for Industry

- Identifying alternative manufacturing routes
- Improving the speed, quality, and predictability of production
- Minimizing operation and sustainment costs through better reliability of replacement parts

"This tool has the potential to improve collaboration between design engineers and producers more effectively to improve manufacturability and create total cost success." --Shawn Martin, Harrison Steel