

2024 Sandia Additive Manufacturing Competition



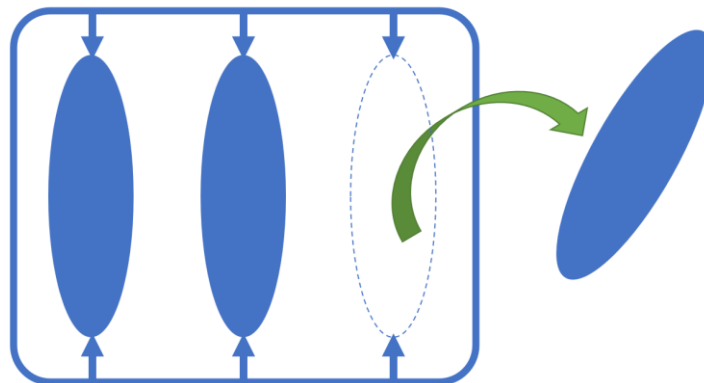
Sandia National Laboratories announces the 2024 Sandia Additive Manufacturing Challenge with the Society of Manufacturing Engineers at UC Davis. The goal of this challenge is to encourage students to think about how they can overcome current manufacturing limitations by taking advantage of 3D printing technologies. This competition is open to any UC Davis students (graduate and undergraduate) interested in additive manufacturing (AM) who are registered SME members at UC Davis. To be a registered SME member students must join the email list and register on Aggie Life. Teams must have 3-5 members and will receive mentoring from Sandians with expertise in additive manufacturing.

Join email list: <https://lists.ucdavis.edu/sympa/subscribe/sme-members>

Register on Aggie Life: https://aggielife.ucdavis.edu/feeds?type=club&type_id=39538&tab=home

Prompt

Create a “flat pack” snap-out (similar to those that come in model kits) design that can be manufactured in a vertical orientation to allow for multiple flat packs to be 3D printed at once. The piece parts of a single snap pack will be used to assemble a toy car with wheels that can spin freely.



2D visualization of removing a piece part from a flat pack snap-out

Stretch Goal

Analyze how thermal stresses during the manufacturing process may deform the part to be out of geometrical tolerance.



Relevance

One key advantage to AM is the ability to fabricate geometries that are otherwise impossible using conventional tools. However, one limitation of AM is the throughput and relative cost per part. Being able to intelligently design parts to a larger assembly that can also maximize the productivity of a printer's build volume helps reduce cost and improve manufacturing productivity. A "flat pack" snap-out design is easier when built atop a single build plate, but more challenging when produced in a vertical and nested configuration to fill a printer's entire build volume. This is more relevant in powder-based technologies than Filament Deposition Method (FDM), but the concepts remain the same.

Rubric

	1	2	3	Total
Demonstrate flat pack can be printed vertically	Flat pack cannot be printed vertically	N/A	Flat pack can be printed vertically	
Amount of post-processing required	Requires a large amount of post-processing	Requires a moderate amount of post-processing	Minimal to no post-processing required	
Fit & finish of pieces into final assembly	Pieces do not fit into final assembly	Pieces fit poorly into final assembly	Pieces fit well into final assembly	
Creativity	Design is unexceptional	Design is acceptable with some innovations	Design is innovative and thoughtful	
Presentation	Presentation lacks focus	Presentation is relevant to prompt	Presentation is well articulated, focused, and relevant	

Stretch goal: up to 5 extra points: _____

Total Score: _____

Contact Information

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