SaTC-Edu: Collaborative: Developing a Comprehensive Education and Training Initiative for Cybersecurity Risks in Additive Manufacturing (AM) Processes

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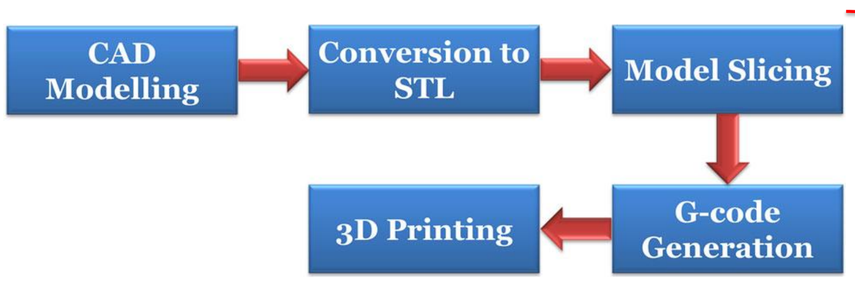
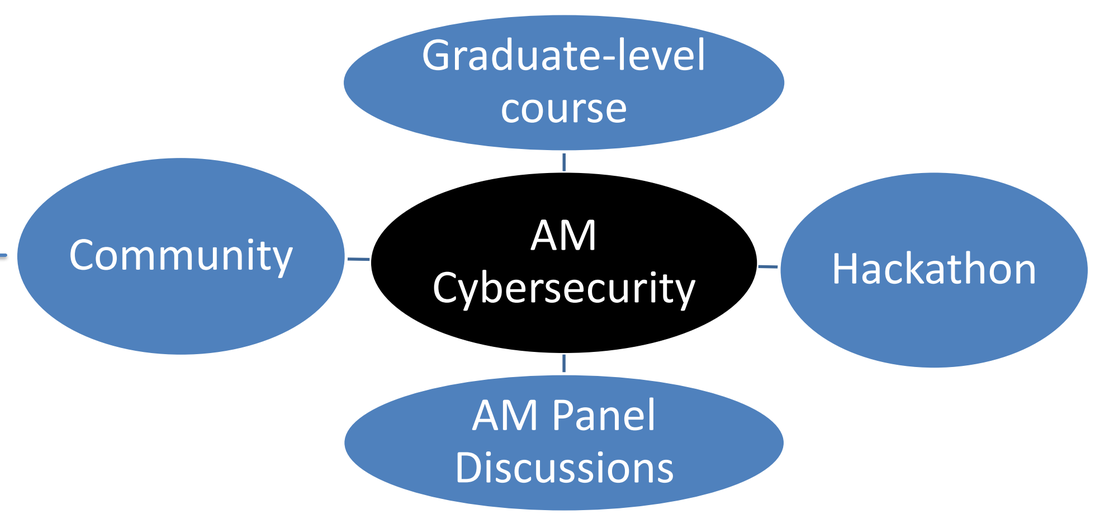
https://wp.nyu.edu/cmml/amseceducation/

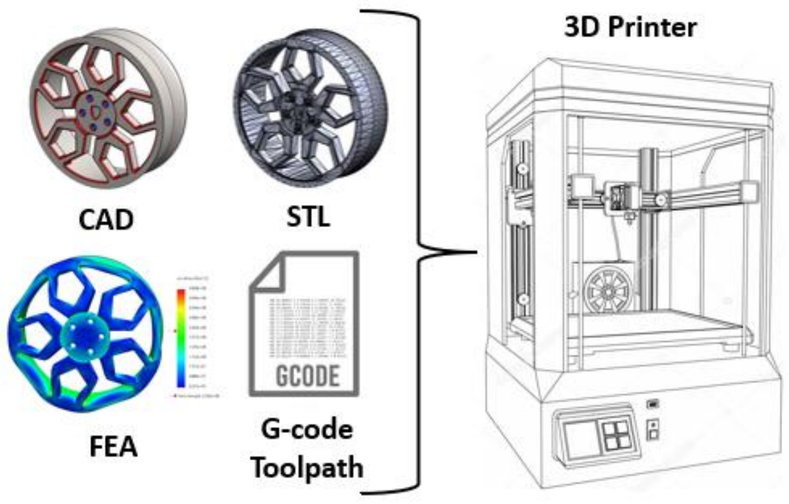
Digital workflow of the AM process



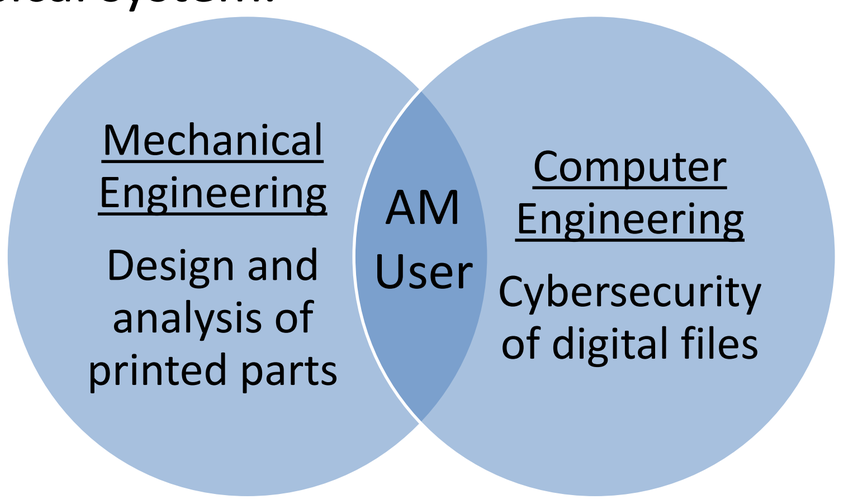
Cyber threats hidden in workflow



Challenge: AM process chain faces a unique set of cyber-physical risks. Project goal is to train a multidisciplinary community of students and professionals in AM cybersecurity.



Scientific Impact: As AM continues to be adopted in various industries, additional training needs to be developed to bridge the gap between mechanical and computer engineers when working in the AM cyber-physical system.



Hack3D (18'-21') – global student cybersecurity competition on additive manufacturing and computer aided design

CSAW'21 Hack3D

Hack3D Year	2020	2021
# of students	86	1377

Virtual Panel Discussion (20'-22') – Networking webinar to gather a manufacturing cybersecurity community from all fields to address the trends and limitation in AM.

AM Panel Discussions

Security Webinars	Panelists	Attendees
8	29	743

Broader Impact: Traditional mechanical engineering curriculum does not cover security risks of cyber-physical systems. This project aims to create educational resources for students and professionals to prepare them for future challenges in cybersecurity for AM.

Education: A graduate level course on AM Security offered in Fall 2020 and 2021. Total enrollment of 22 students with diverse backgrounds. Collaborative effort with NY City Tech in course offerings.

Outreach: Recordings of panel discussion and training programs are available on YouTube for public viewing.

Participation: Obtained a contact list of 2000 people through multiple events on AM cybersecurity.

From 2020 to 2021:

- 7 hackathon competitions
- 8 virtual panel discussions
- 2 semesters of AM Security graduate course offering