



ASME-CIE Hackathon 2022

Hackathon Problem 2: Digital Manufacturing
Cybersecurity Strategies for Protecting
Valuable Information in Design Files

Gary Mac
08.13.2022



Organizers & Mentors



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Hammond Pearce
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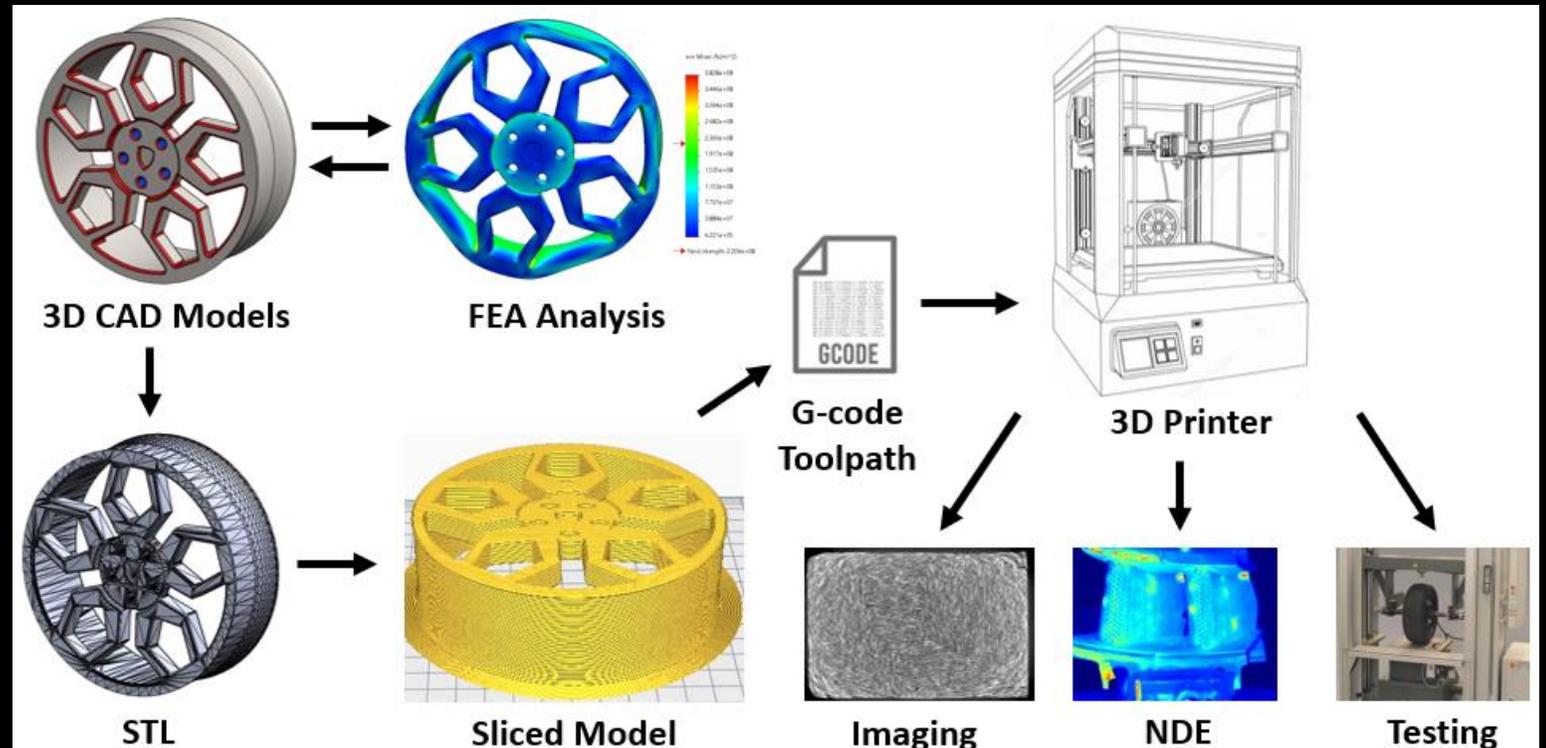
Yan Lu
Information Modeling and Testing
Group Leader
National Institute of Standards and
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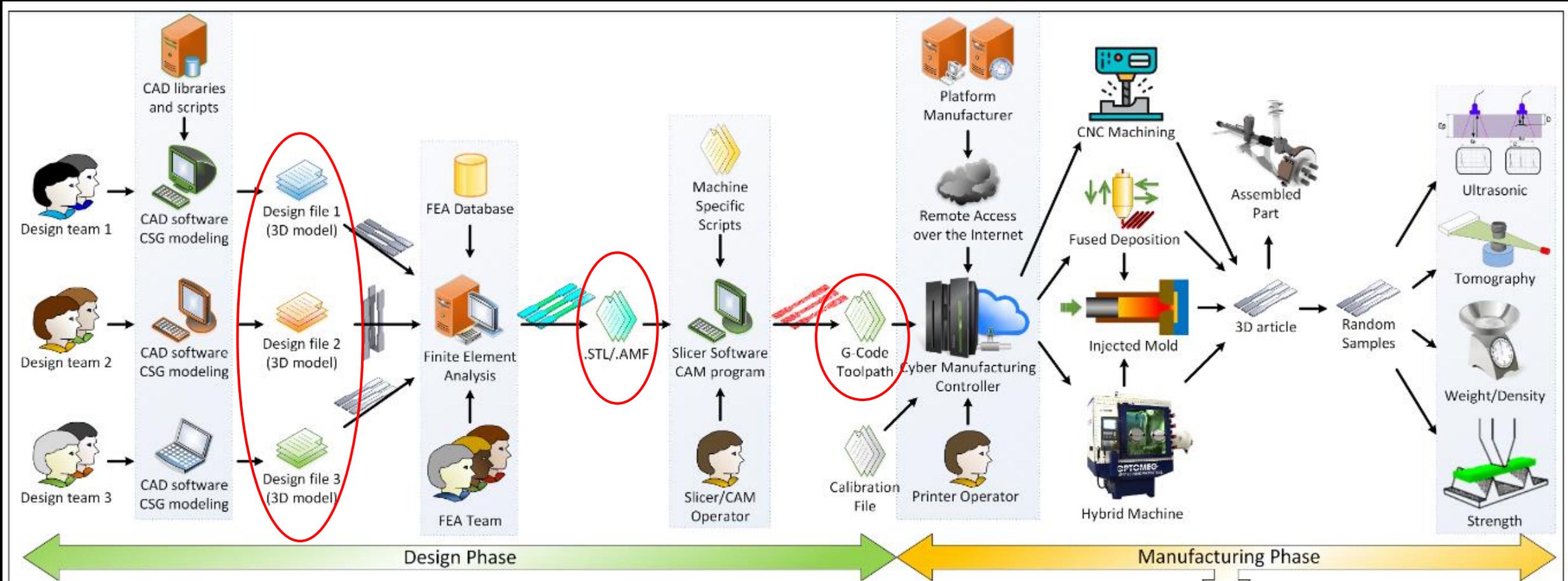
Additive Manufacturing

- Cyber-physical system that includes design files, computers, and 3D printers

Research Focus:
 Digital manufacturing
 Cybersecurity
 Cyber-physical systems
 Reverse engineering
 File manipulation
 CAD/STL/G-code
 Software and hardware



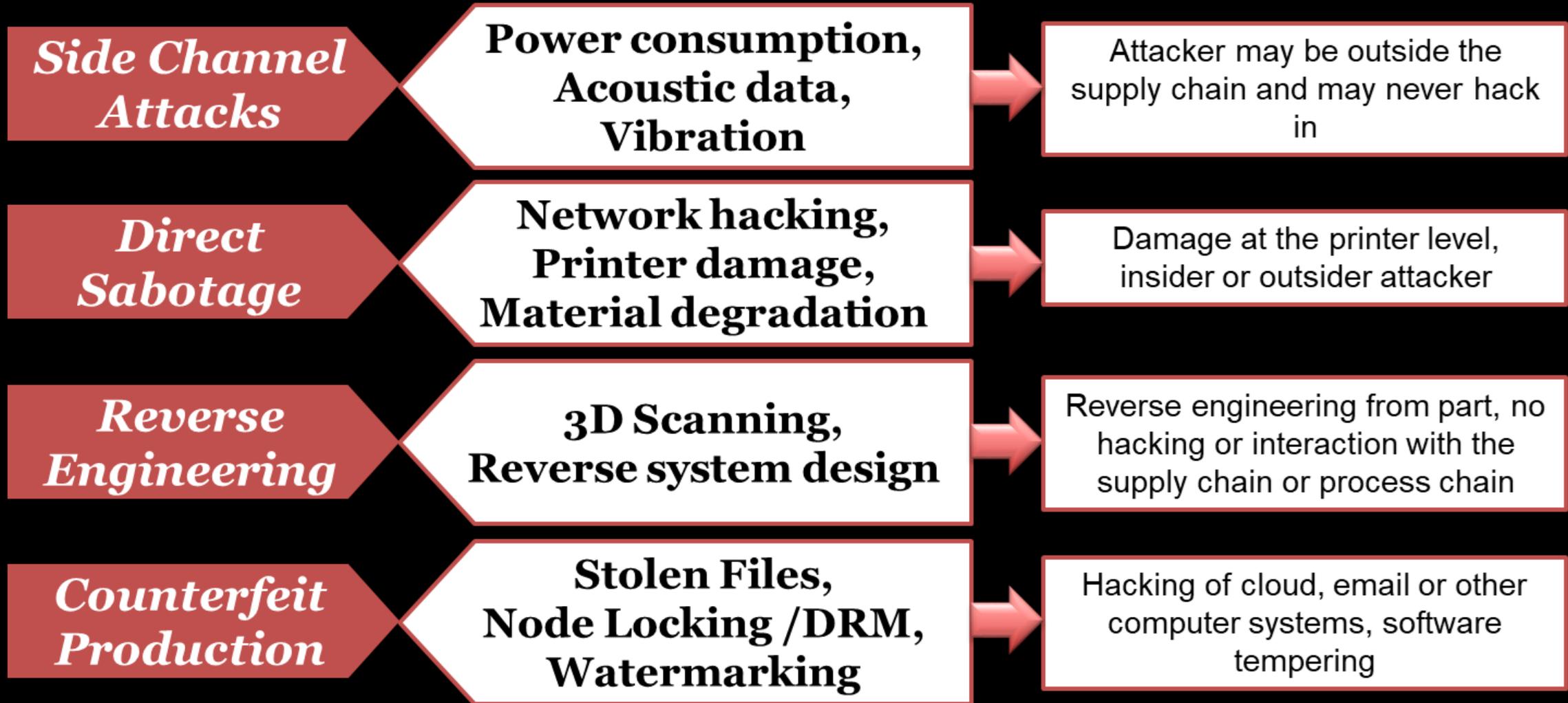
Digital Manufacturing Process



Digital design files are vulnerable to cybersecurity threats

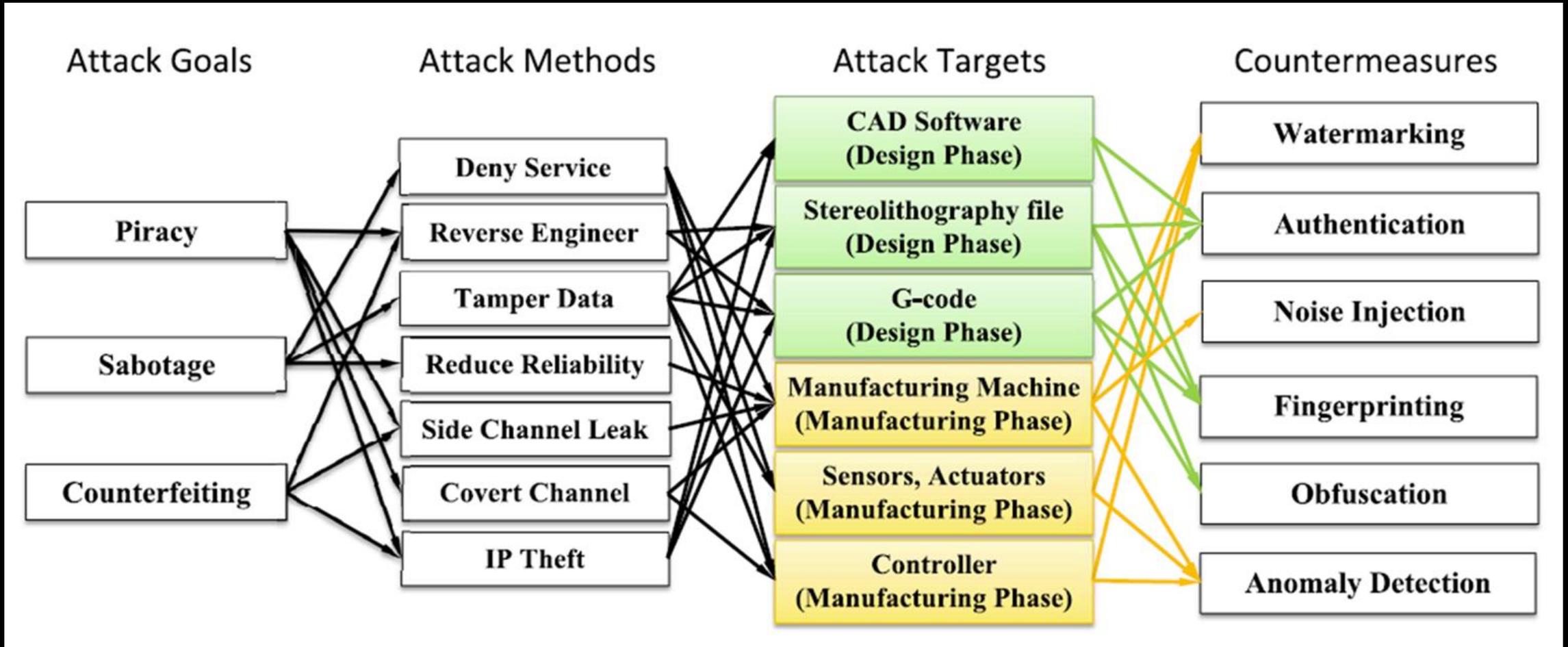


Threat Vectors



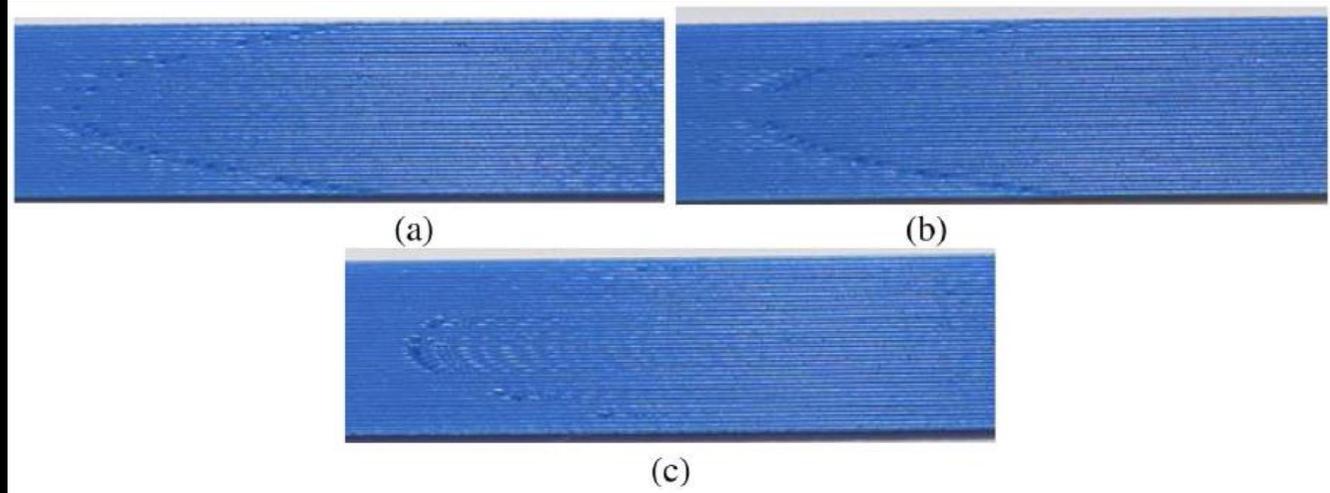
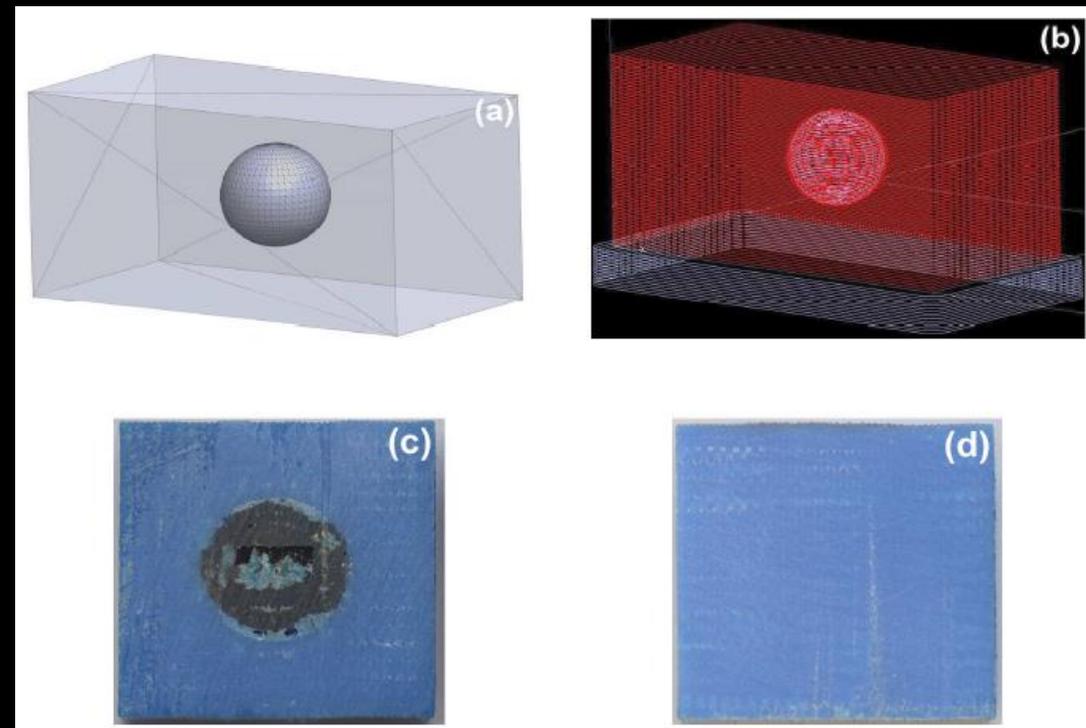
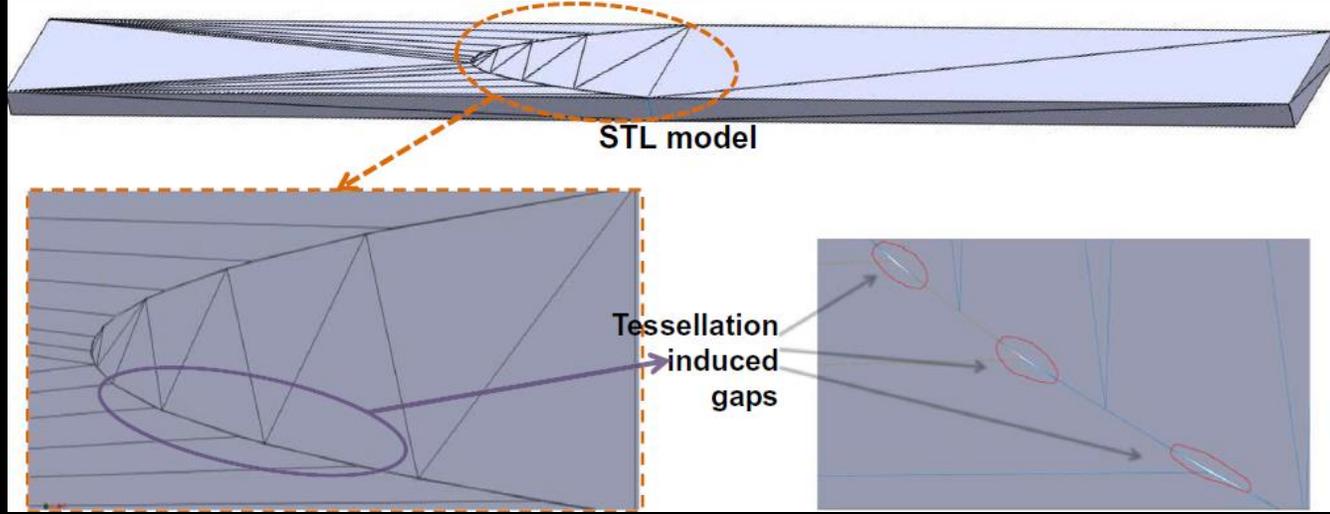


Attack Taxonomy

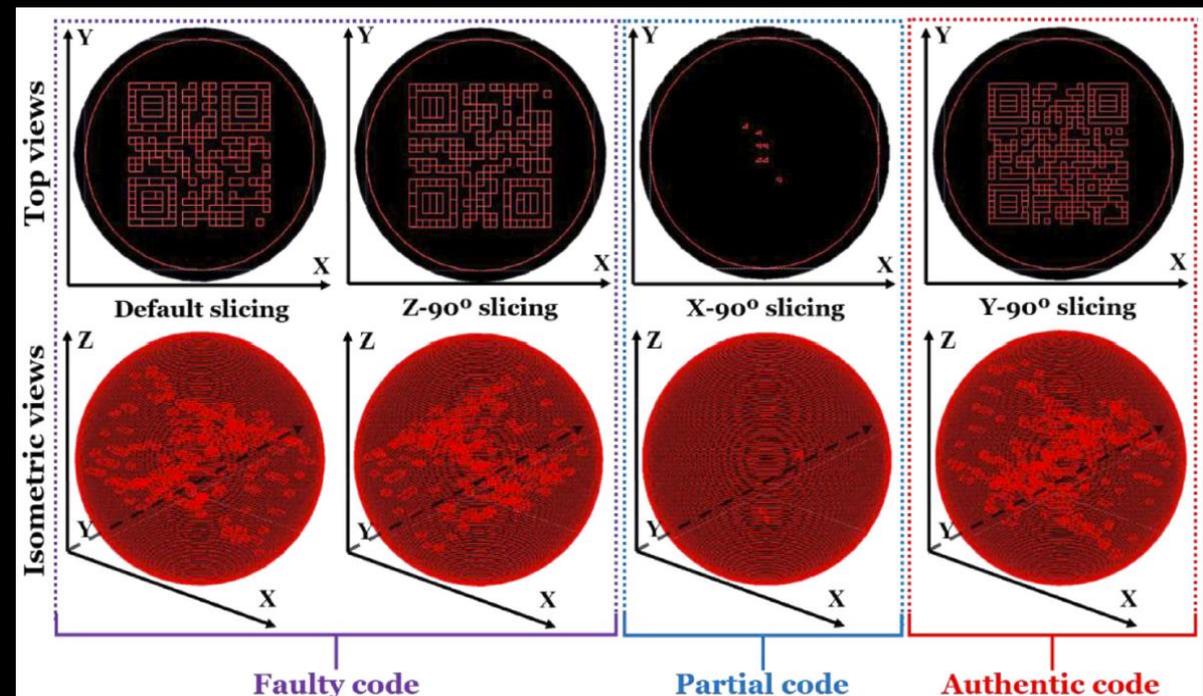
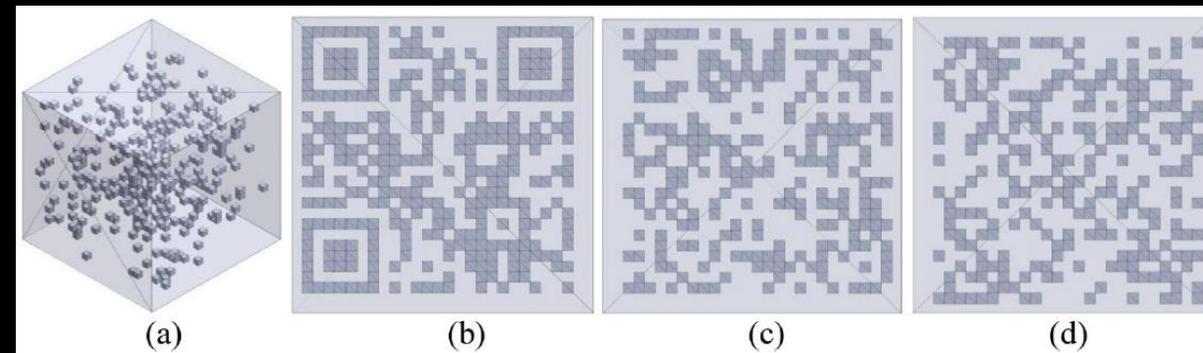
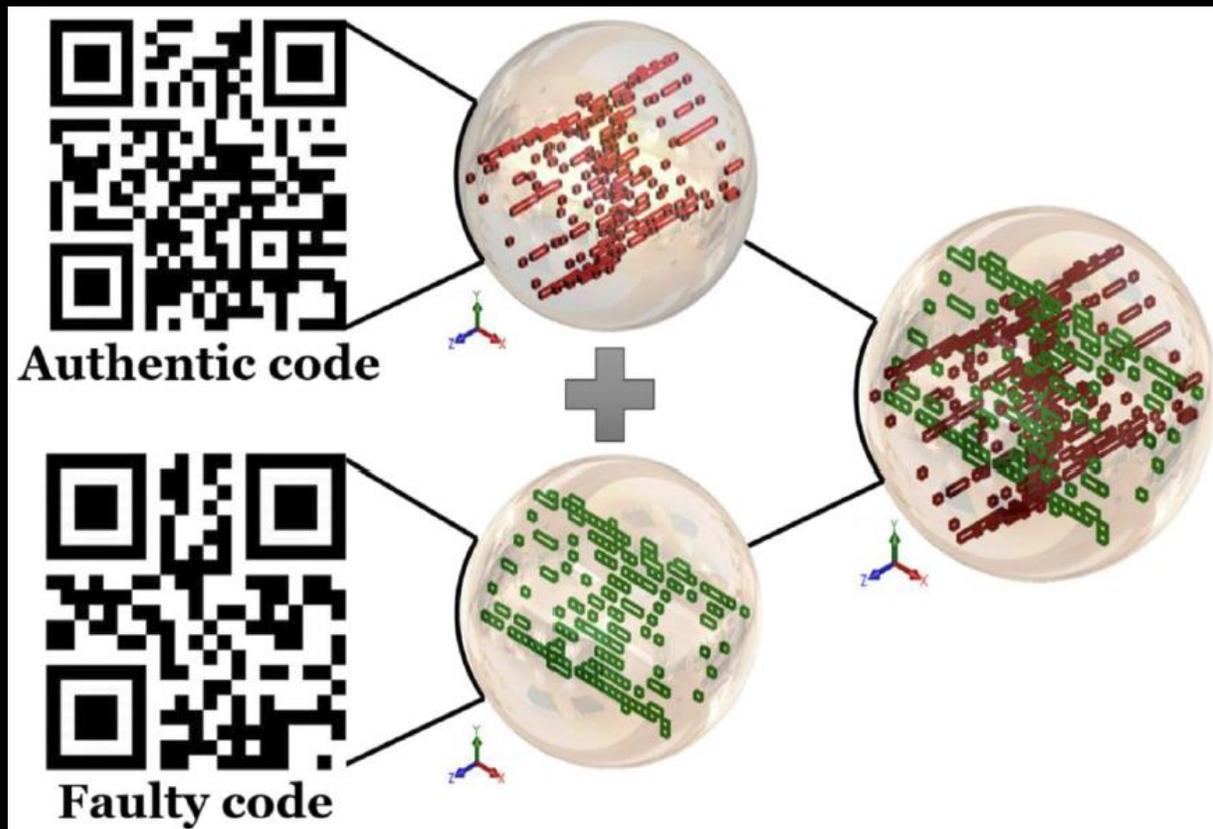




Research – Surface Markings & Embedded Code



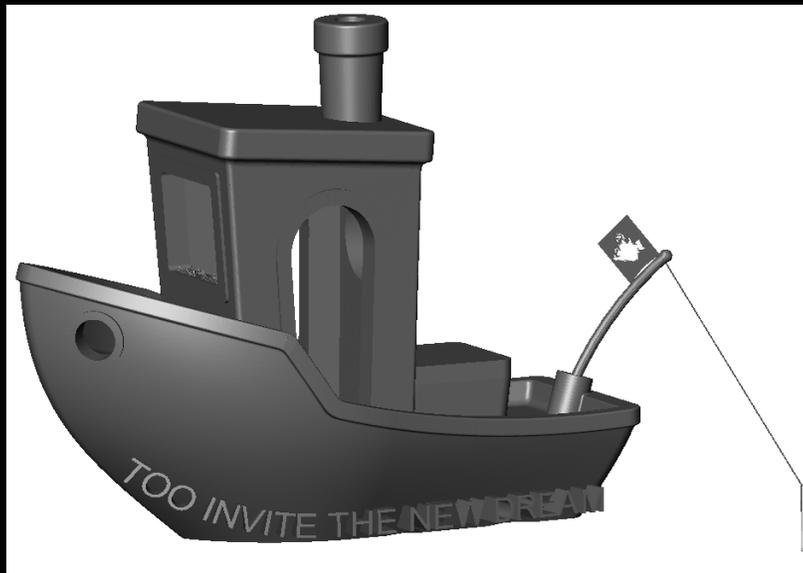
Embedded QR Codes





Hackathon Problem 2

- A digital model of a boat (STL file format)
- Determine the location by decoding all 5 clues in the file

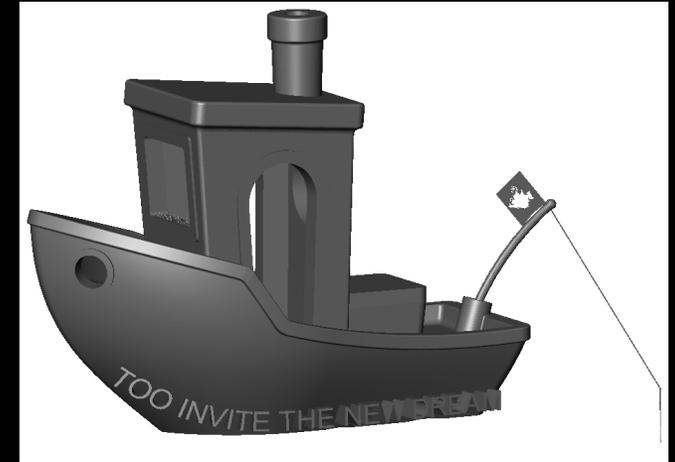


Hint #	The location provided by the hint	Brief description of the hint and solution method
1	?	
2	?	
3	?	
4	?	
5	?	



Hackathon Problem 2 - Submission

1. A detailed word document
 - i. Submission table for each of the 5 hints
 - ii. A description of the brainstorming process
 - iii. A summary of any other approach attempted
2. The presentation slides
3. Any supplementary file to support your report



Hint #	The location provided by the hint	Brief description of the hint and solution method
1	?	
2	?	
3	?	
4	?	
5	?	



Hackathon Problem 2 - Judges



John Hoyt
Lead Cybersecurity Engineer
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Michael P. Bourque
Director of Digital Manufacturing
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Junfeng Ma
Associate Professor
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