Towards Security of Additive Layer Manufacturing

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Additive [Layer] Manufacturing

- Also Known As
  - Rapid Prototyping
  - 3D Printing
  - ...

- Advantages
  - Development Time
  - Manufacturing Costs
  - Necessary Storage
  - On-Demand Production
  - ...

- Materials
  - Plastic
  - Metals & Alloys
  - Tissue
  - Food

[www.ge.com]
WiP Thrust I: Cyber-Physical Attacks

- Cyber Manipulations
  - 3D Object Specification
  - Manufacturing Properties
- Physical Consequences
  - Size/Shape
  - Weight
  - Physical Properties
- Broader Impacts
  - Physical Destruction
  - Economical Damage
  - Changed Public Opinion

Under Review:
- Mark Yampolskiy, Lena Schuetzle, Uday Vaidya, Alec Yasinsac, Additive Layer Manufacturing with Metallic Alloys: Security Challenges
- Mark Yampolskiy, Jana Ivanidze, Anthony Skjellum, Ruel Overfelt, Alec Yasinsac, 3D Printer as a Weapon

(Causal Chains, excerpt)
WiP Thrust II: IP Protections

- Business Requirements
  - Outsourcing Flexibility
  - Low Manufacturing Costs
  - Require Protection
    - Intellectual Property (IP)
      - 3D Models
      - Manufacturing Parameters
    - Restrictions
      - Licenses

Presented at PPREW:


(Current Outsourcing Model) (Proposed Outsourcing Model)
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