REVOLUTIONISING MINERAL SEPARATION USING ADDITIVE MANUFACTURING

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Gravity Separation Spirals

- Used in mining industry to separate minerals from slurry
Challenges in Traditional Manufacturing

1. Time consuming
2. Labour intensive
3. Hazardous
4. Difficult to customise
R&D Project Objectives

- Develop a 3D printer to print spirals
- Integrate IoT capabilities

Flow rate
Temperature
Wear
Strain
IoT Enabled Smart Spirals

- 3D print or embed sensors to measure spiral operation conditions:
  - Wear
  - Flow rate
  - Strain
  - Temperature
Benefits to the Industry Partner

• Ship a printer rather than spirals
  > Reduce transportation cost
  > Reduce damage during transportation
• Easily customisable for different minerals
• Troubleshoot issues remotely
• Fault prediction
• Provide feedback to optimise output
Applications in Other Industries

- Printing helical pattern
- Printing large-scale real-world equipment
  - Current printer: 0.015m³ (Build 200mm diameter 500mm height)
  - Planned printer: 0.77m³ (700mm diameter 2000mm height)
  - 13th largest 3D printer in the world (Source: https://www.aniwaa.com/largest-3d-printers/)
- Embedding sensors inline with the printing
Thank You!