Programming of Collaborative Robot (Cobot) to Selectively Disassemble Products to Obtain Critical Materials

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Opportunity and Significance
End-of-life products that contain critical materials, such as rare earth magnets, are often discarded even though there is remaining value that can be fed back into a remanufacturing process.

- Critical materials exist in products today
- Scarce supply for materials and highly controlled
- Essential materials in advanced technologies

Technical Objectives
The overall objective is to diversify the supply of critical materials by mining salvaged electric machines. This will lead to additional value streams to maximize accessibility. This research aims to assist the project in developing high throughput and economic value recovery from electric machines.

- Recover products that contain critical materials
- Automation is required for this process to be cost effective
- Creation of flexible automation line by using cobots to train the line

Technical Approach, Accomplishments and Results
A virtual collaborative robot cell was created in the ROBOGUIDE program by FANUC.

- CR-4IA collaborative robot (Figure 1)
- Design of workcell setup based on Figure 4
- Simulation created using workcell
  - To model real robotic movements and possible collisions with workstation, part, or human
- Trajectory pulled from simulation
  - Models a screw being removed and discarded

References

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