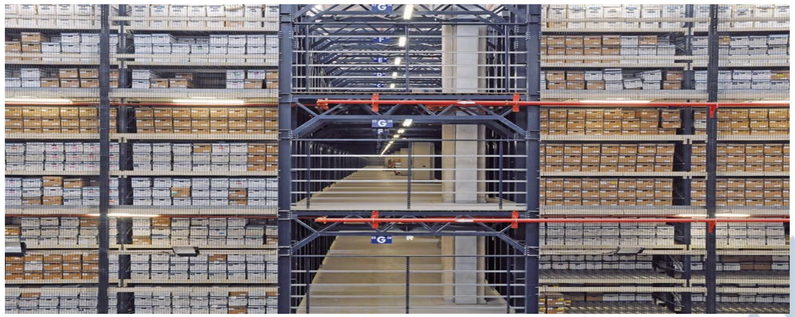
Olin College of Engineering

Automation of Document Preparation for High-speed Scanning

IRON MOUNTAIN®

Project Background

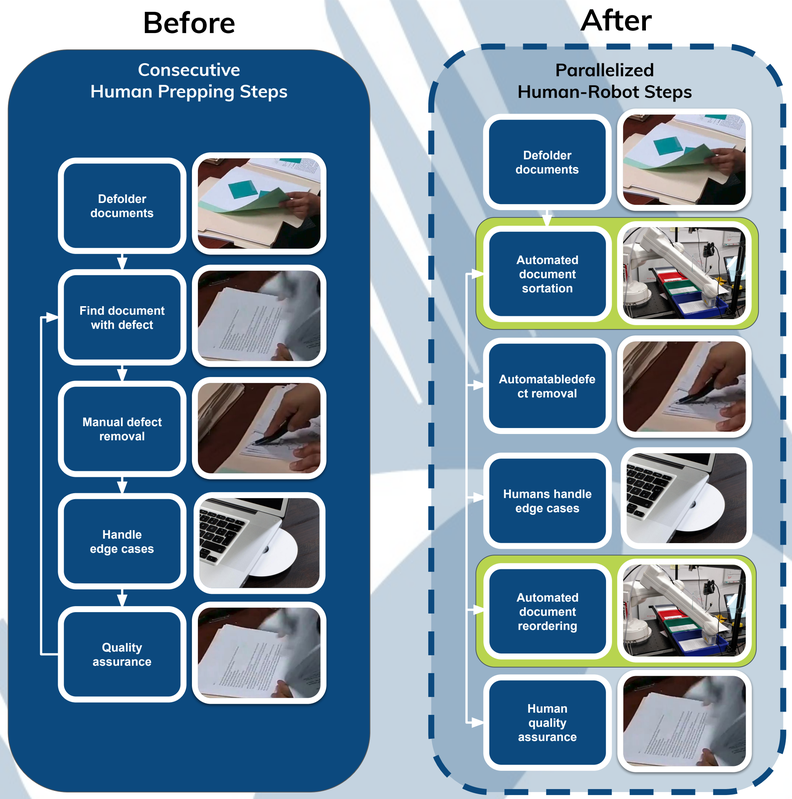
Iron Mountain is a document storage company serving numerous FORTUNE 500 companies. As part of their transition into the digital age of document storage, they are now uploading their customers' documents as well as storing them.
We were tasked with making the upload scanning process as painless as possible.



Why scanning is hard

Before high-speed scanning can take place, many documents that are stored at Iron Mountain facilities need to be prepared by removing staples and fixing tears, a process that is currently **slow**, **manual**, and **expensive**.

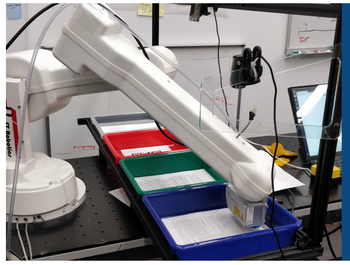
Our Proposed Change



Will humans be replaced?

No! We interviewed current workers and learned they value the variety of cross-training, not the challenge of removing certain defects.
Our work is targeted towards increasing worker efficiency and time spent on other, more interesting tasks, like cross-training.

Engineering Prototypes

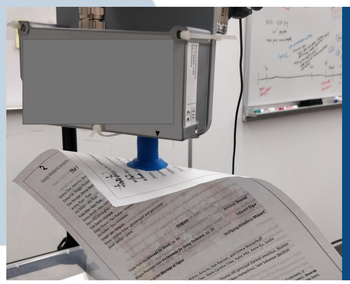


Document Transport

We use a robot arm to provide a fast and modular prototype for dexterous manipulation of documents across various stages of our processing pipeline. All motion is additionally simulated to avoid expensive collisions.

Document Sorting & Reordering

We use depth sensing to locate staples to remove. Using QR codes, we are able to keep track of the order of stapled packets, then reorder them correctly once defect removal is complete.



Gripping

An critical part of the sortation process is the ability to reliably pick up and move single sheets of paper.
Our prototype solution utilizes a suction system optimized for thin materials.

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