

Seeing the Future of Digital Archives: A Vision Science Research Repository Pilot Project

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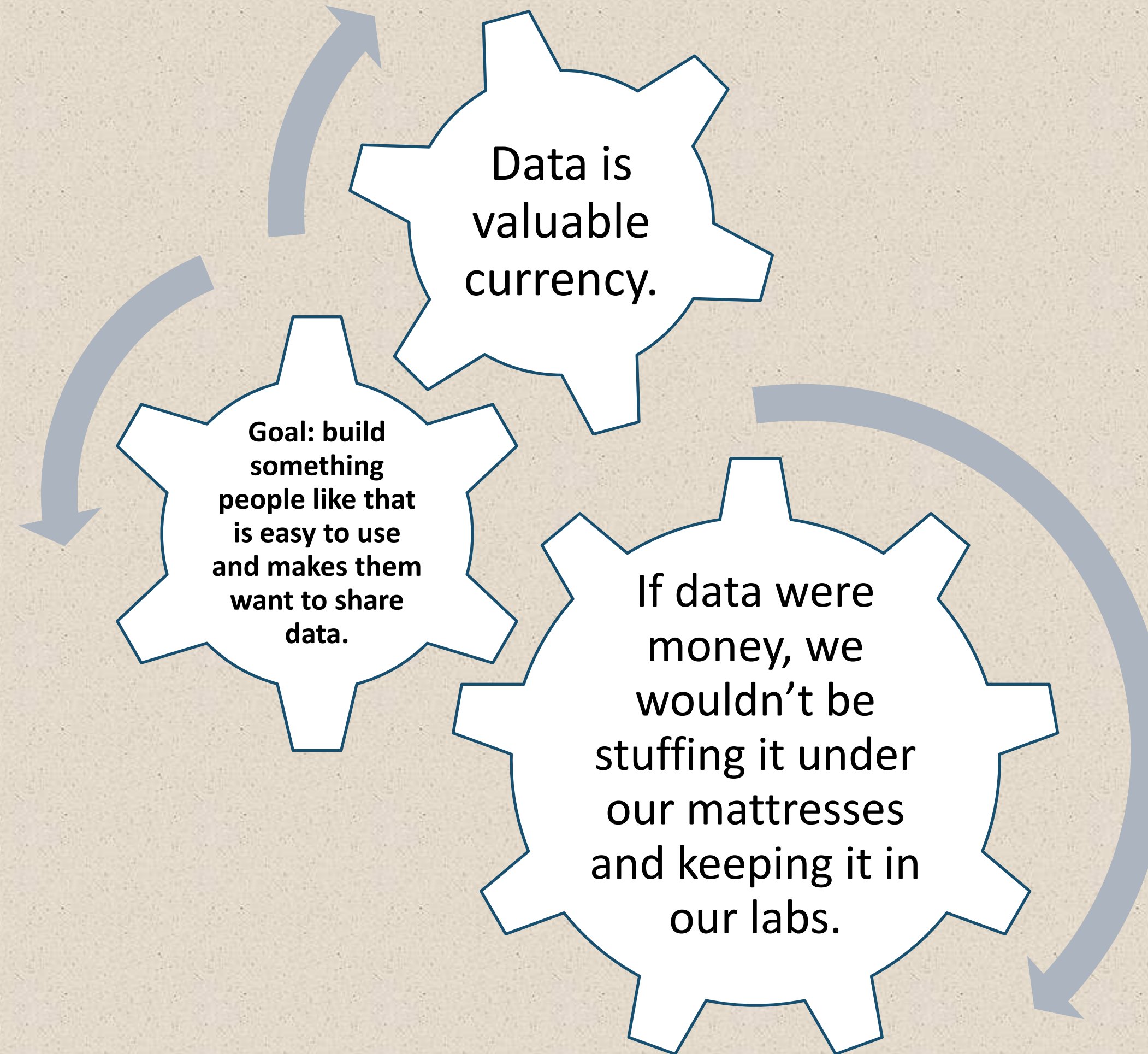
Objective:

The project's objective is to create an institutional repository using open source software to collect, share, and preserve the intellectual property of the University of Alabama at Birmingham (UAB)'s School of Optometry. The goal is to seamlessly connect the School's data, knowledge, and scholarship to the greater global health and vision community by providing online access to images, data sets, streaming media, protocols, lab notes, article preprints, works in progress, and brain-mapping data.

Purpose:

- Distribute unique data resulting from scientific pursuits in progress that cannot be found through conventional publication channels
- Share intellectual knowledge and make the information accessible to the global health community
- Provide UAB with a cohesive platform to self-archive scholarly research and materials

With a DOI, data and images can be pulled out to an e-poster or lab web site to highlight research. Scholarly publications can link to a repository with the author's datasets and bench notes so experimental data can be made open. Data needs to be social, tagged, and findable. Making this data social will allow institutional repositories to be open for the scientific community to recreate the results and will enable researchers to comment on the data's quality and validity.



Design Phase:

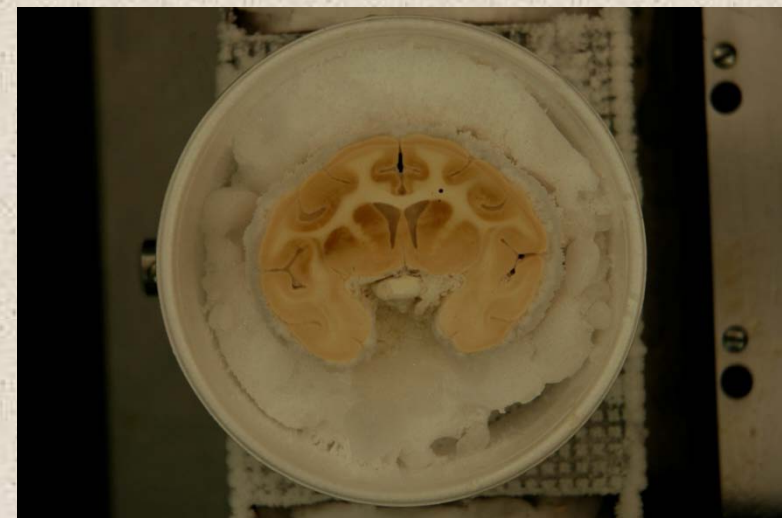
For the pilot, the investigators looked at three platforms:

- DSpace
- Islandora (Fedora)
- Alfresco

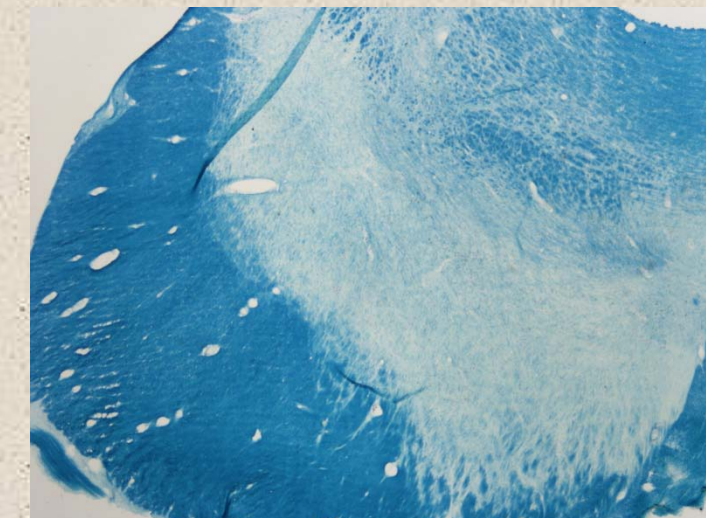
Initially, the investigators planned to utilize DSpace, a reputable and tested open source repository system. However, DSpace was unable to ingest and properly display such large image sets.

From there, the investigators moved on to Islandora which could ingest images, but it was unable to ingest large batches of images. This meant our researchers would have to upload images individually and not in sets.

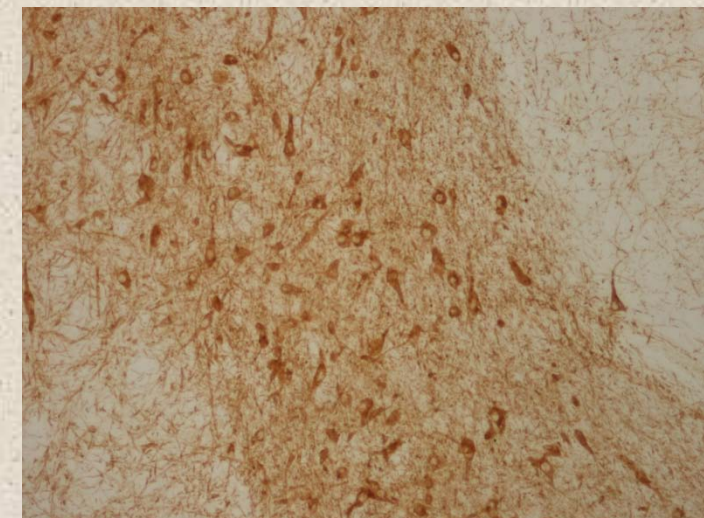
Out of the three platforms, the best to handle biomedical data is Alfresco, an open source content management system. Initial testing showed that Alfresco can ingest and display neuroimage and behavioral datasets. We are still testing Alfresco to ensure the system meets all of our needs.



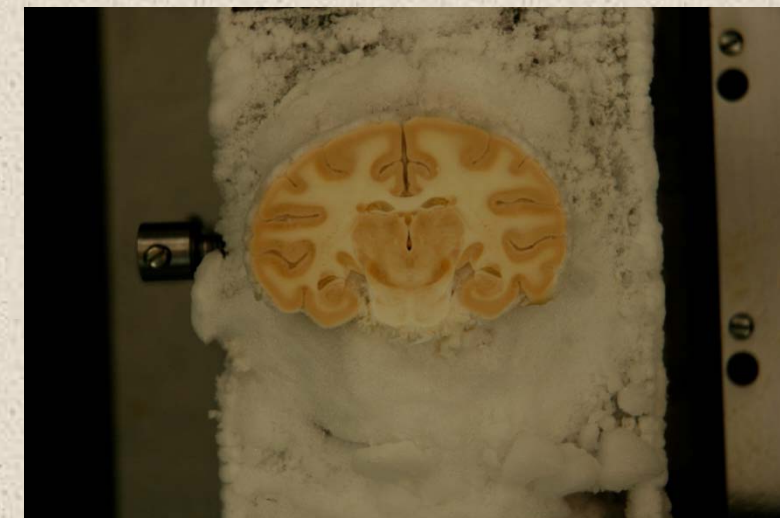
Coronal block-face brain image from macaque during sectioning at the level of the optic chiasm. Natural contrast: white matter white and grey matter is tan.



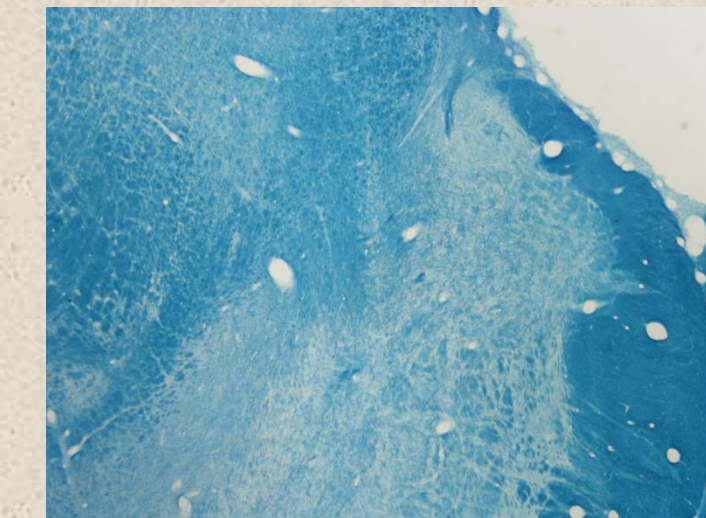
Midbrain cross-section (macaque) using Klüver-Barrera myelin stain. Note the cerebral peduncles (darker blue) at the bottom of the image.



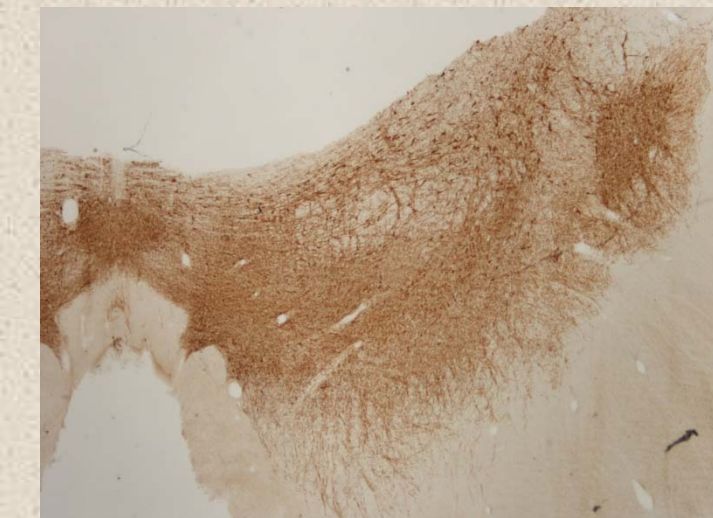
Midbrain cross-section (macaque) using tyrosine hydroxylase stain for dopaminergic and noradrenergic neurons. This image shows detail from the substantia nigra pars compacta.



Coronal block-face brain image from macaque during sectioning at the level of the geniculate nucleus of the thalamus. Natural contrast: white matter white and grey matter is tan.



Midbrain cross-section (macaque) using Klüver-Barrera myelin stain. Note the cerebral peduncles (darker blue) at the right of the image.



Midbrain cross-section (macaque) using tyrosine hydroxylase stain for dopaminergic and noradrenergic neurons. Note the ventral tegmental area (small brown patch on the far left) and substantia nigra pars compacta (crescent shaped patch through much of the center of the image).