USC's Dornsife Neuroimaging Center Uses Flywheel to Improve Data Sharing and Collaboration

The Dornsife Neuroimaging Center uses Flywheel's research data platform to support research productivity across the University of Southern California community.

A New Solution for Data Access and Distribution

The Dana and David Dornsife Cognitive Neuroimaging Center (DNI) is a resource for USC scientists seeking to understand the relation between neural and mental phenomena in humans. The Center serves the neuroimaging needs of researchers across the university as they seek to disseminate knowledge about the brain, mind, and imaging practices to students and the public.

A few years ago, the Center's leadership recognized the need for a better mechanism to distribute data to researchers across the USC community. After lab partners used the scanners at the center, the data from those scans then had to be transferred to DVDs and delivered to individual researchers. In other cases, the data was pushed from the scanner onto the researcher's own DICOM server. These processes sometimes resulted in delays and quality concerns because they were manual.

At the same time, Dr. Jonas Kaplan, Assistant Research Professor of Psychology at USC's Brain and Creativity Institute and Co-Director of the DNI, was looking for a new platform to manage his own lab's data. He was seeking a way to more quickly and accurately access and curate his data while also providing a mechanism for securely sharing data with collaborators and students.

Delivering Value Added Services and Improving Productivity for Lab Partners

Dr. Mara Mather, a professor of Gerontology and Psychology, introduced Dr. Kaplan to Flywheel, a comprehensive data management platform for imaging research. After learning more about the capabilities of Flywheel, including the ability to ingest data from disparate sources, curate data to common standards, automate processing and provide for secure collaboration, the DNI chose to install Flywheel to help manage and distribute the Center's data.

With Flywheel, the Center is able to provide value-added services to research labs across the university and support improved productivity through faster, secure delivery of data. Center administrators can also ensure quality control with automated checks and support remote access. Research on the USC campus was halted during the 2020 spring and summer semesters. With Flywheel as the DNI's research data platform, users had uninterrupted access to their prior scans and could proceed with analyzing their data.

> "Now more than ever, when our in-person research is interrupted and we are collaborating remotely, our ability to quickly access a shared set of data in Flywheel is a huge benefit to our research community. Flywheel provides us with a platform so we can continue to support our researchers across the university and they can remain highly productive in driving important research studies forward,"
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> — Dr. Jonas Kaplan, Co-Director of the DNI

Cloud-Scale Processing and Reproducibility for Imaging Researchers

In addition to using Flywheel to manage the Center's data, Dr. Kaplan uses the lab version to manage his own research on consciousness, self, empathy, social relationships, action perception and creativity. With Flywheel's capabilities to automatically convert data from DICOM to NIfTI and support consistent data curation, Dr. Kaplan was able to spend much more time analyzing the data and disseminating findings instead of having to spend his time managing and processing data.

Additionally, since Flywheel is a cloud-scale solution, data can be processed much faster and more reliably than previously possible with an on-premise solution. Dr. Kaplan chooses from Gears on the Gear Exchange, which run anything from basic pre-processing to complex algorithms. With Flywheel's exceptional provenance capabilities, Dr. Kaplan can quickly and easily find all the components of a research project to identify code versions, inputs, and outputs and support reproducibility.

Ensuring Secure Collaboration

Data sharing and collaboration on larger and larger data sets will enable greater heights of discovery in neuroscience. Dr. Kaplan is excited to be supporting broader connectivity to data at USC and at external institutions with Flywheel's custom access controls and support for common standards. Dr. Kaplan easily shares real data and code with students in his MATLAB and fMRI courses, enhancing their learning experience.

> "With Flywheel, we simply expect our data to exist in the cloud. We have empowered our community of researchers with comprehensive data management and analysis tools. The Flywheel team is responsive to our needs and is always improving the software based on how we are using it."
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> — Dr. Jonas Kaplan, Co-Director of the DNI