



## **Meet the GREI Repositories**

### October 12, 2022 GREI Collaborative Webinar Series





### **Meet our Speakers**







Ishwar Chandramouliswaran GREI Program Director, NIH ODSS

Sonia Barbosa, Manager of Curation, Harvard Dataverse

Jennifer Gibson, Executive Director, Dryad





Ana Van Gulick, PhD, Government and Funder Lead, Head of Data Review, Figshare







### **Meet our Speakers**



Luca Belletti, Product Manager, Digital Commons Data/Mendeley Data

MENDELEY DATA



Eric Olson, Product Manager, Center for Open Science (Open Science Framework)





Ida Sim, MD, PhD, Professor of Medicine and Computational Precision Health, UCSF, Vivli





Sara Gonzales, Senior Data Librarian, Northwestern University, Zenodo



## **Generalist Repository Ecosystem Initiative**



# GREI Program – Include GR's in the NIH Data Ecosystem via the Concept of "Co-opetition"



## **GREI Fact Sheet**

#### **NIH Generalist Repository Ecosystem Initiative**

The mission of GREI is to establish a common set of capabilities, services, metrics, and social infrastructure; raise general awareness and facilitate researchers to adopt FAIR principles to better share and reuse data.

This initiative will further enhance the biomedical data ecosystem and help researchers find and share data from NIH-funded studies in generalist repositories.

Goals of the Generalist Repository Ecosystem Inititative



#### Objectives



- Catalog Use Cases Supported
- Implement Open Metrics
- Prepare Training Materials
- Conduct Outreach
- · Commit to 'Coopetition'

- · Implement Best Practices for Data Repositories
- Support Discovery of NIH Funded Data
- · Adopt Consistent Metadata Models
- Facilitate QA/QC
- Connect Digital Objects



### https://doi.org/10.6084/m9.figshare.21318270

## **Generalist Repository Features**



### **NIH Research Data Ecosystem**





### **Desirable Characteristics of Data Repositories**

When choosing a repository to manage and share data resulting from Federally funded research, here are some desirable characteristics to look for:



Guidance set forth by NIH And by <u>The National Science</u> and Technology Council, cited in OSTP guidance



### Generalist Repository Comparison Chart

doi: 10.5281/zenodo.3946720

This chart is designed to assist researchers in finding a generalist repository should no domain repository be available to preserve their research data. Generalist repositories accept data regardless of data type, format, content, or disciplinary focus. For this chart, we included a repository available to all researchers specific to clinical trials (Vivii) to bring awareness to those in this field.

https://fairsharing.org/collection/GeneralRepositoryComparison

TOPIC	HARVARD DATAVERSE	DRYAD	FIGSHARE	MENDELEY DATA	OSF	VIVLI	ZENODO
Brief Description	Harvard Dataverse is a free data repository open to all researchers from any discipline, both inside and outside of the Harvard community, where you can share, archive, cite, access, and explore research data.	Open-source, community-led data curation, publishing, and preservation platform for CCO publicly available research data Dryad is an independent non-profit that works directly with: - researchers to publish datasets utilizing best practices for discovery and reuse - publishers to support the integration of data availability statements and data citations into their workflows - institutions to enable scalable campus support for research data mangment best practices at low cost	A free, open access, data repository where users can make all outputs of their research available in a discoverable, reusable, and citable manner. Users can upload files of any type and are able to share diverse research products including datasets, code, multimedia files, workflows, posters, presentations, and more. With discoverable metadata supporting FAIR principles, file visualizations, and more impactful and more impactful and more research further faster.	Mendeley Data is a free repository specialized for research data. Search more than 20+ million datasets indexed from 1000s of data repositories and collect and share datasets with the research community following the FAIR data principles.	OSF is a free and open source project management tool that supports researchers throughout their entire project lifecycle in open science best practices.	Vivili is an independent, non-profit organization that has developed a global data-sharing and analytics platform. Our focus is on sharing individual participant- level data from completed clinical trials to serve the international research community.	Powering Open Science, built on Open Source. Built by researchers for researchers, Run from the CERN data centre, whose purpose is long term preservation for the High Energy Physics discipline, one of the largest scientific datasets in the world
Size limits	No byte size limit per dataset. Harvard Dataverse currently sets a file size limit of 2.508.	300GB/dataset	Soft limit of 20GB/file for free accounts. System limit of 5000GB/file. Unlimited storage of public data but 20GB storage for private data for free accounts. Email info@figshare.com to have upload and storage limits raised.	10GB per dataset	Projects currently have not storage limit. There is a 5GB/Hie upload limit for native 05F Storage. There is no limit imposed by 05F for the amount of storage used across add-ons connected to a given project.	If more than 10GB per study data, reach out to us	SOOB per dataset, contact us via https:// zenodo.org/support for higher limits
Storage space per researcher	1 TB per researcher	Nolimit	Nolimit	Nolimit	No limit	No limit	Nolimit
Persistent, Unique Identifier Support	DOI, Handle	DOI	DOI	DOI	DOI	DOI	DOI

### https://doi.org/10.5281/zenodo.3946719

(Updated version 2!)

## Common features and unique features

**Common:** Core Metadata Persistent Identifiers Discoverable Flexibility Open access, FAIR Metrics

Unique: Output types Storage, size limits Licenses Review Controlled Access Visualization Costs



## A few questions for you: A Zoom Poll





- 1. What is your role in NIH Data Sharing?
- 1. Have you published data in a repository previously?
- 1. What do you feel are the biggest barriers to data sharing for you?





## Let's meet our GREI repositories



## **Dataverse**







### Dataverse



### Dataverse World-wide Community (dataverse.org)

- Open-source software
- Two bi-weekly Community calls
- Annual Community meetings (since 2015)
- Global Dataverse Community Consortium (GDCC)



#### Open source research data repository software



Enjoy full control over your data. Receive web visibility, academic credit, and increased citation counts. A personal Dataverse collection is easy to set up, allows you to display your data on your personal website, can be branded uniquely as your research program, makes your data more discoverable to the research community, and satisfies data management plans. Want to set up your personal Dataverse collection?



Seamlessly manage the submission, review, and publication of data associated with published articles. Establish an *unbreakable link* between *articles in your journal* and *associated data*. Participate in the open data movement by using a Dataverse collection as part of your journal data policy or list of repository recommendations. Want to find out more about journal Dataverse collections?



Establish a research data management solution for your community. Federate with a growing list of Dataverse repositories worldwide for increased discoverability of your community's data. Participate in the drive to set norms for sharing, preserving, citing, exploring, and analyzing research data. Want to install a Dataverse repository?



Participate in a vibrant and growing community that is helping to drive the norms for sharing, preserving, citing, exploring, and analyzing research data. Contribute code extensions, documentation, testing, and/or standards. *Integrate research analysis, visualization* and *exploration taols*, or other research and data archival systems with the Dataverse Project. Want to contribute?







### **Current Features**

#### **Dataverse Collections**

- Own administration
- Own branding (and can be embedded anywhere)

#### **Datasets**

Files

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- Citation •
- Metadata
- Versioning
- Private URL
- Custom Terms/Multiple License/Permissions
- Guestbooks
- **Publishing Workflows** •

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Ingest Preview/Explore •

Citation

- Metadata .
- Versioning
- Permissions/Embargo/Re . strictions

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Author Name Buckner, Pandy L. (1) Rofman, Joshia L. (1) Smolec, Social X (1)			
Author Affiliation Havard University (1)			





### **Current Features**



Installations



Collections

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#### Datasets



Files

### NIH OTA Adds...

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### Datasets

- New Workflows for Large Data Support (Globus, demo)
- **Remote** Data Support (TRSA)
- Flexible Biomedical Metadata Support through External • Vocabularies and Data Dictionaries (UMLS, CEDAR, MeSH)

#### Files

- Additional Metadata for **Code files** (Codemeta) •
- Support for **Replication Packages** through Workflows and Containers
- Sensitive Data Support through Differential Privacy • (OpenDP, DataTags, PSIprivacy)
- Encryption
- **Usage Metrics** •
- UX/UI Enhancements
- New APIs
- Interoperability

- Metadata Harvesting •
- **Curation Services**
- Training and Outreach







### **Current Features**

#### Dataverse Collections

- Own administration
- Own branding (and can be embedded anywhere)

#### **Datasets**

- Citation
- Metadata
- Versioning
- Private URL/\*Anonymous Peer Review
- Custom Terms/\*Multiple Licenses/Permissions
- Guestbooks
- Publishing Workflows

# 

- Files
  - Citation
  - Ingest
  - Preview/Explore
  - Metadata/Provenance
  - Versioning
  - Permissions/Embargo/Re strictions







- Support for FAIR Data Principles
- Data citation for datasets and files
- OAI-PMH (Harvesting)
- APIs for interoperability and custom integrations
- API client libraries
- DataCite integration
- Login via Shibboleth
- Login via ORCID, Google, GitHub, or Microsoft
- Login via OpenID Connect (OIDC)
- Internationalization
- Versioning
- Restricted files
- Embargo
- Custom licenses
- Custom terms of use
- Publishing workflow support
- File hierarchy

- File previews
- Preview and analysis of tabular files
- Usage statistics and metrics
- Guestbook
- Fixity checks for files
- File download in R and TSV format
- Faceted search
- Customization of collections
- Private URL
- Widgets
- Notifications
- <u>Schema.org</u> JSON-LD
- External tools
- External vocabulary
- Dropbox integration
- GitHub integration
- Integration with Jupyter notebooks

- User management
- Curation status labels
- Branding
- Backend storage on S3 or Swift
- Direct upload and download for S3
- Export data in BagIt format
- Post-publication automation (workflows)
- Pull header metadata from Astronomy (FITS) files
- Provenance
- Support for rsync
- Auxiliary files for data files









An open data publishing platform & community committed to the open availability and routine re-use of all research data



- $\rightarrow$  Not for profit
- $\rightarrow$  Started by researchers
- $\rightarrow$  Connected to the publishing workflow
- $\rightarrow$  Supported by institutions





- $\rightarrow$  Serving all research domains
- → Leader in research data
- → Interconnected
- → Fully curated





Dryad is best for data that:

- 1. Doesn't have a home in a specialist repo
- 2. Can be released under a CC0 license
- 3. Is intended for reuse





## Focus on reuse

https://bit.ly/dryad-reuse



Not-for-profit and online since 2008. Learn more: datadryad.org











### *10 years of figshare*

4 million+ research outputs

### 500,000+ users

100s of TBs of data stored

100,000+ citations

80+ Research Organizations



#### simplify your research workflow

Upload > Manage > Share > Publish





a freely available generalist repository for all research disciplines and outputs

#### Flexibility

- ▲ Share any research output or file type
- Files up to 20GB, Support for big datasets
- Preview files in the browser
- Collections

### Researcher Workflows Per

Open API and FTP

GitHub, GitLab, BitBucket Integrations

Laborative spaces

Restricted Access

#### Persistent Metadata

- doi Unique DOI for each output, reservable
- ORCID integration
- Link to publications
- Link Funding via Dimensions

#### **Open Access**

- Open Access to all public files and metadata
- CC0 and CC-BY Licenses
- Discoverable across search engines, indexes
  - FAIR commitment

#### Impact

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Public Author Profile

figshare.com

- Views, Downloads, Citations, Altmetrics
- Citations from full text literature
- Taceted Search

Fublish datasets over 20GB+ to 5TB or more
 File sizes up to 5TB
 Cne-time data publishing charge





### Many item types, any file, group as items & collections







### **Describe your work**









Read the associated publication

natural behavior eve tracking

CATEGORIES

KEYWORDS

LICENCE

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Select an option w

Necroscience

Ratinal optic flow during natural locomotion



#### Retinal Optic Flow During Natural Locomotion - Videos

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Store of the videos associated with the publication titled "Retinal Optic Flow during Natural Locemotion" published in PLoS Computational Biology https://doi.org/10.1371/journal.pcbi.1009575

See related dataset at: https://doi.org/10.25452/figshare.plus.17113883

#### Author Summary

Saitch View 14 files

We recorded the hit floop/ kinematics and binocular galo of human wahing through nealword natural reninvents and estimated with anyolino policy. Boylino computational video analysis will geometric simulation. Contrary to the established themses of the nin and petch main the contrast of the human structure movement from, hand centric update flow in highly unstable due to the compare planet trajectory of the human due to the structure structure and the system movement from the adding structure location, rendering ta multiples. The structure and the structure structure and the system structure structure of collesing nution centreric of the System. Reliable applications the policy consolition of collesing nution centreric of the System. Reliable applications the policy chards the system structure policy. The search adding of the site structure of collocations and provide powerful, introduction and the system structure to the system and collesing nution. The search adding of the location is also and controls long parts and any nutional bandwark.

#### Abstract

We examine the structure of the visual motion projected on the retina during natural locomotion in real world environments. Bipedal galt generates a complex, rhythmic pattern of head translation and rotation in space, so without gaze stabilization mechanisms such as the vestibular-ocular-reflex (VOR) a walker's visually specified heading would vary dramatically throughout the gait cycle. The act of fixation on stable points in the environment nulls image motion at the forea, resulting in stable patterns of outflow on the retinse centered on the point of fixation. These outflowing patterns retain a higher order structure that is informative about the stabilized trajectory of the eye through space. We measure this structure by applying the curl and divergence operations on the retinal flow velocity vector fields and found features that may be valuable for the control of locomotion. In particular, the sign and magnitude of foveal curl in retinal flow specifies the body's trajectory relative to the gaze point, while the point of maximum divergence in the retiral few field specifies the walker's instantaneous overconund velocity/momentum. vector in refinotopic coordinates. Assuming that walkers can determine the body position relative to gaze direction, these time-varying retinolopic cues for the body's momentum could provide a visual control signal for locomotion over complex terrain. In contrast, the temporal variation of the eve-movement-free, head-centered flow fields is large enough to be problematic for use in steering towards a goal. Consideration of optic flow in the context of real-world locomotion therefore suggests a re-evaluation of the role of optic flow in the control of action during natural behavior.

FUNDING CPS Training Grant National Eye Institute Find out more...

Vision in Natural Tasks National Eye Institute Find out more...

GAZE AND THE VISUAL CONTROL OF FOOT PLACEMENT WHEN WALKING OVER ROUGH TERRAIN National Eye Institute

Find out more ...

GAZE AND THE VISUAL CONTROL OF FOOT PLACEMENT WHEN WALKING OVER ROUGH TERRAIN

### Author Profiles Metrics

### **Associated Paper**

### Description for discovery & reuse

#### License



A Show footer



## **Mendeley Data**





### Mendeley Data supports research data management workflow

Mendeley Data is a secure, cloud-based generalist repository where you can store data, ensuring it is easy to share, access and cite, wherever you are.



### Ensuring compliance and supporting open data

Mendeley Data complies with FAIR data principles to ensure compliance to funder mandates. Metadata for all datasets published in Mendeley Data are available in an open format to facilitate large-scale acquisition and analysis of records—underscoring our commitment to open science.

#### **Secure Storage**

To ensure security, data is stored on Amazon's S3 servers. Our service was extensively penetration tested and received certification. Additionally, your valid published datasets are archived in perpetuity to preserve your data long-term. This ensures that the DOIs we provide for datasets will always resolve to a web page, where the dataset metadata and files will be available.

#### **Easy Curation**

The Mendeley Data team supports the curation process before datasets are published. Datasets that do not meet the requirements for validity (scientific in nature and consisting of research data) will not become publicly visible. By reviewing your datasets prior to publication, and approving, editing, or returning datasets with comments, the Mendeley Data team helps to keep the quality of your content high.

#### **Improving impact**

Published dataset metadata is aggregated to DataCite's metadata index and to the OpenAIRE portal. Metrics on downloads, views and data citations, sourced from DataCite and Crossref, are displayed on each dataset, as well as metrics capturing social media attention.



Learn more about the benefits of Mendeley Data here: https://data.mendeley.com/ <u>Mendeley Data</u> Support for institutions is also available! More information here: https://www.elsevier.com/solutions/digital-commons/data

### Mendeley Data at a Glance





Support for institutions is also available! More information here: https://www.elsevier.com/solutions/digital-commons/data



### Mendeley Data at a Glance

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Tabular Data (1292) Decamere (A18) Softwart/Code (1297) File Set (155) Test (136) Image (121) Other (%b) Video (20) Sequencing Data (11) Stelds (% Georgani Data (8) Audio (% SURCE TYPES ^ Data Repositories (1022) SOURCES ^ Mendeley Data (2029)	Published 29 December 2021 (Mendely Data COVID-19 Ceed-19 Survey without 9 or 1.cov Provide Instein Data Departure Mark Anta de Ward Dublished 21 August 2361 (Mendely Data Photone Dublished 21 August 2361 (Mendely Data Photone Data Photone Data Departure CovID-19 Research Environment Photone Data Departure CovID-19 Research Environment Photone Data Departure CovID-19 Research Environment Photone Data	CVUD-19 outbreak, marging such a hig became interested or intelligence voice sas deal with this random prediction accuracy, to ourcoming any characteristic out of that random prediction accuracy, to ourcoming any characteristic out of that random prediction accuracy, to ourcoming any characteristic our of that random prediction accuracy, to ourcoming any characteristic our of that random prediction accuracy, to our our of that random prediction accuracy, to our our our prediction accuracy, to our our of that random prediction accuracy, to our our our prediction accuracy, to our our our our prediction accuracy, to our our our our our our our our our our	occurred from China which spreads between people through close contact of the infected person. In this pandemic, gh number of patterns is difficult. Already, 5.3 million people have died. For this disease, people from all over the world in telemedicane. The low lobs of people solved many providems using telemedicate that's why we are proposing and finded aistant that can help whether a particular person is COVID-19 suppected or not. Our artificial vice Assistant to help people forcematance. We applied several machine learning algorithms like Gini Index, Random Forest, Entropy, KINA, Decision Tree, forest provide solve high provide, whether that particular user might have COVID Our ont. We took a survey and collected 513 peoples. We applied several machine learning algorithms like Gini Index, Random forest algorithm, we had 9235, which was reasonable. So, our ultimate goal is during this kind of epidemic, medical wice assistant, assists people in which was reasonable. So, our ultimate goal is during this kind of epidemic, medical wice assistant, assists people in been step without 0 or Losv. 21 KB covID-19	Views:     353       Downloads:     364       OPLUTIX     Veexedatals:       Version 1     29 Dec 2021       DOI:     10.17613/pmmong/J7mk.1       Cite this dataset     Antificial Voice Assistant for COVID-19       Subjects:     Antificial Voice Assistant for COVID-19       Subjects:     Antificial Voice Assistant for COVID-19       Subjects:     Nendeley Data, VI, doi:       10.17633/pmmamg8/mk.1     Copy to clipboard
	Amanasio Damalia, Athanasio Damain Published 8 March 2021   Mendeley Data COVID-19	CC BY 4.0	Learn more	



Support for institutions is also available! More information here: https://www.elsevier.com/solutions/digital-commons/data



## **Open Science Framework**





### Why We Build Infrastructure

**COS Mission:** to increase openness, integrity, and reproducibility of research

**COS Infrastructure Vision**: To empower communities, institutions, and funders to advance rigor and transparency of research.



### OSF and Supporting Research Across the Lifecycle

A free, open source online research platform, designed to support researchers to openly, and transparently share their work at all stages of the research lifecycle.



### OSF and Supporting Research Data Across the Lifecycle

#### Discover

Find data, papers, protocols, and project plans from across the OSF and additional providers.

#### Plan

Preregistration enables researchers to describe their hypotheses, variables, and more in a timestamped document before gathering data.

#### Manage

Bundle your data, files, protocols, narrative and other project dependencies into customizable directories.

#### Integrate

Connect the storage, preservation, citation, and identifier tools that you already use.

### Collaborate

Control access by collaborators or make work open to the public, while relating your outputs with one another.

#### Document

Use wikis to keep notes or provide context to readers, with version control for wikis and files. Modifications to materials logged and identified.

#### Share

Share what you want, when you want, with the appropriate license, and with fine-grained control over which aspects of your work are made public.

Public content is indexed Google Scholar, European PubMed, and more.

#### Report

Gain impact insights beyond citation rates including how many people are accessing and downloading your research materials.

Services for communities enable activity aggregation across stakeholders.



### Enabling Connections Across the Research Lifecycle



OSF connects the valuable tools researchers and stakeholders use, across the research lifecycle to maximize efficiency and advance openness, transparency, and reproducibility of research.

### Enabling Connections Across the Research Lifecycle

#### Preregistration

Use DOIs to reliably connect research inputs and outputs including data, code, materials, and other supplements generated as well as resulting publications



Provide attribution to all of your collaborators. Acknowledgement will be synced with their ORCID iD if provided

Preregistration timestamp

Preregistrations are backed up on Internet Archive

Verified contributor affiliations





ORCID Connecting Research and Researchers



RORX











### Vivli – The Organization

Non-profit membership organization

 Sharing individual participant-level data from 6,800 studies

 43 members from industry, academia, and NIH (BioLINCC, ImmPORT, etc.)







### Vivli – The Platform

✓ A user-friendly, secure, state-of-the art platform that meets all NIH Desirable characteristics

- We make it as easy as possible to share and analyze NIH-funded human subjects data
  - Submitted data must be anonymized
  - Managed access: data requesters submit request and sign DUA



 In 2023, we will be implementing CRedIT for research teams who share their data on Vivli



**Contributor Roles Taxonomy** 



### **Vivli's NIH Data Sharing Model**

### **Current NIH model**

1) Vivli supports discoverability of NIH domain repositories

Promotes discoverability of NIH domain repository studies (NCT-IDs) for those datasets available for cross-listing on Vivli (BioLINCC, ImmPort, NIAID, etc.)

2) NIH grantees can directly share their data on Vivli



If no domain repository exists, Vivli will support NIH grantees to share their anonymized data to meet their grant commitments.

3) Data Aggregation



NIH-funded datasets may be aggregated with industry and other datasets on Vivli through either a secure environment or via download









## ZEOCO Research. Shared.

### Upload

- All file formats accepted
- 50GB per deposit
- GitHub integration

### Publish

- Data citation
- Control access levels
- Usage statistics / metrics
- DOI versioning
- File previews
- Link to related research



### Describe

- DataCite Metadata Schema
- Custom metadata fields
- Funder integration
- Communities feature
- Wide license selection

## Compliance with sharing mandates

- Deposit data files and supporting materials
- Restricted files / embargo
- Private record sharing

### Persistent Metadata

- DOIs for all deposits
- Reserve DOI
- PID-enabled metadata fields: ORCiD, subject vocabularies
- FAIR data

### **Common Formats**

- DataCite
- OAI-PMH
- DublinCore
- JSON
- Schema.org
- REST API
- CSL



### Multi-disciplinary - custom metadata



10.5281/zenodo.5497144 (Figure)

Custom keywords: Genus 🔽 Pliolestes Species C venetus Kingdom 🗹 Animalia Order 🖸 Paucituberculata Scientific name authorship Goin Phylum 🕑 Chordata

#### Locations:

R / V Alis, EBISCO Expedition, st. DW 2613, Plateau des Chesterfield (-19.616667, 158.7 C) NEW CALEDONIA: 42.5 × 19.4 mm, R/V Alis, EBISCO Expedition, st. DW 2613, Plateau des Chesterfield, 19°37' S, 158°42' E, 519-522 m (MNHN IM-2007-30854; Fig. 9A; GenBank accession number (cox1 sequence): KJ550158). R / V Alis, EBISCO Expedition, st. DW 2610, Plateau des Chesterfield (-19.566668, 158.68333 C) 16.3 × 13.0 mm, R/V Alis, EBISCO Expedition, st. DW 2610, Plateau des Chesterfield, 19°34' S. 158°41' E. 486-494 m (MNHN IM-2000-30789; paratype 2; Fig. 9D; fragment of the spire, well preserved).

Coral Sea (-19.616667, 158.7 C) NEW CALEDONIA: Coral Sea, Plateau des Chesterfield, 19°37' S, 158°42' E, 519-522 m (EBISCO st. DW 2613).





### **Communities**



submissions are welcome too, includin

### Projects, Subjects, Institutes, Nations, Conferences, ...





### GitHub integration

Making Your Co     0 10 minute read	ode Citable		November 13, 2019 COBMO - Control-oriented Building Model Sebastian Trotzach, Torimaso Mori, Anthony Vautin New features - Demand side flexibility evaluation. - Data reference socian in documentation.	g	27 1	
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Contact the GREI program at <u>GREI@nih.gov</u>







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