

Data Sharing Guide

Version 2, Updated May 2021

Data Sharing

1 Objective

Hello, and thank you for being a part of this amazing community driven effort. What makes it a community driven effort is that it is designed for students, by students. Members utilizing this service (yes, you) are requested to be respectful and professional to one another.

The objective of this effort is to increase collaboration between teams so that each member can have access to shared resources, thereby empowering them to push the technology envelope into uncharted waters.

Such efforts can only be sustained through your contributions as a responsible user. If you download and use any of the data provided, you are also expected to upload data (after you have collected data). This may not be possible if you are a new team, and that is okay.

Folder structure will vary with tasks and the competition (RoboBoat, RoboSub, and RobotX). Please review the [Folder Structure](#) on page 4, to learn about how the data is organized.

2 Requirements

This effort, like many others, is guided by a set of requirements that must be adhered to in order to participate.

Generic Email Account

- Teams must have a generic email account (.edu or something else) to participate in this opportunity (*for example: robonation@robonation.edu, robonation@outlook.com*).
- This generic email must be used as the primary Point-of-Contact during the competition registration process (or intent to compete process).
- This generic email must be used to create a complimentary box.com account for the team.

Data Access

- After teams have registered for the upcoming competition (or completed the intent to compete), they will receive access to the competition data sharing folder.
- Once a competition year ends, teams will be purged of access to the competition data sharing folder.
- Teams will gain access to the competition data sharing folder, only after successful registration (including the registration fee).

3 Team Access

After successfully completing the registration process (using a generic email address), teams must use the same generic email to create a complimentary Box account (on box.com). This account will be the teams main account, and the only one with Viewer Uploader access (see below for details on this access level). Access to other team members can be provided by the team's main account, through a shared link. This "secondary" access will have Viewer access only.

Viewer Uploader - upload, download, overview, share, and edit*

Viewer - download, preview, and share

** Viewer Uploader accounts do not have the ability to delete files or rename files*

After teams have created their complimentary box account, access to the data sharing folder can be requested through the respective Band group (RoboBoat, RoboSub or RobotX) on the [Band app](#).

4 FAQs and Support

Frequently Asked Questions (FAQs) have been compiled and are available on the [Data Sharing webpage](#). If you have any questions check this FAQ list, it will continue to grow and evolve as more participants use this tool.

This is a community driven effort and as such, information is provided as is. Direct support is not provided but you may post your questions on the [RoboNation Forum](#) and the Data Moderators will do their best to answer your question in a timely manner. Additionally, you can message Data Moderators within your Band group (on the [Band app](#)) for an inquiry. They are identified by the "Data Mod" tag in their name. Below image provides a visual of how a Data Moderator can be identified on Band.

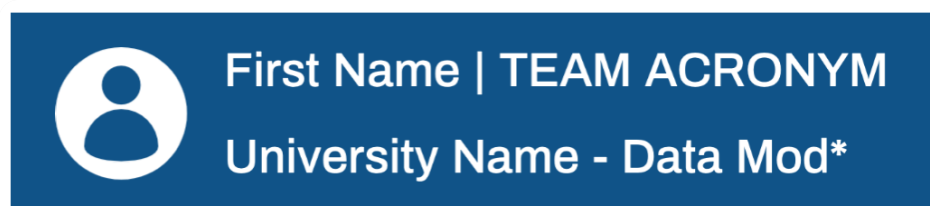


Figure 1: Data Moderator Tag

5 Data Sharing Committee

The Data Sharing Committee is comprised of individual Data Moderators that represent teams from RoboBoat, RoboSub and RobotX competitions. This promising effort would not have been possible without their continued commitment and dedication.

If you are interested in becoming a Data Moderator and joining this committee, please reach out to the Data Moderator in your respective Band or directly to RoboNation at university-competitions@robonation.org.

6 Folder Structure

To ensure maximum utilization of this tool, folders have been created and organized based on the unique data sets for the competitions. When uploading data, teams must create a “Team Folder” using their team acronym and follow a suggested naming convention when uploading and saving data.

An image of the folder architecture is provided below for your visual reference. Each folder (in the image) is linked such that when clicked, it provides more information about the contents of that folder (a ReadMe).

Teams are expected to organize their data prior to uploading. Keep in mind that the Viewer Uploader access that each team has does not allow the ability to delete files or rename files. This will ensure fellow community members can easily locate and use shared data.

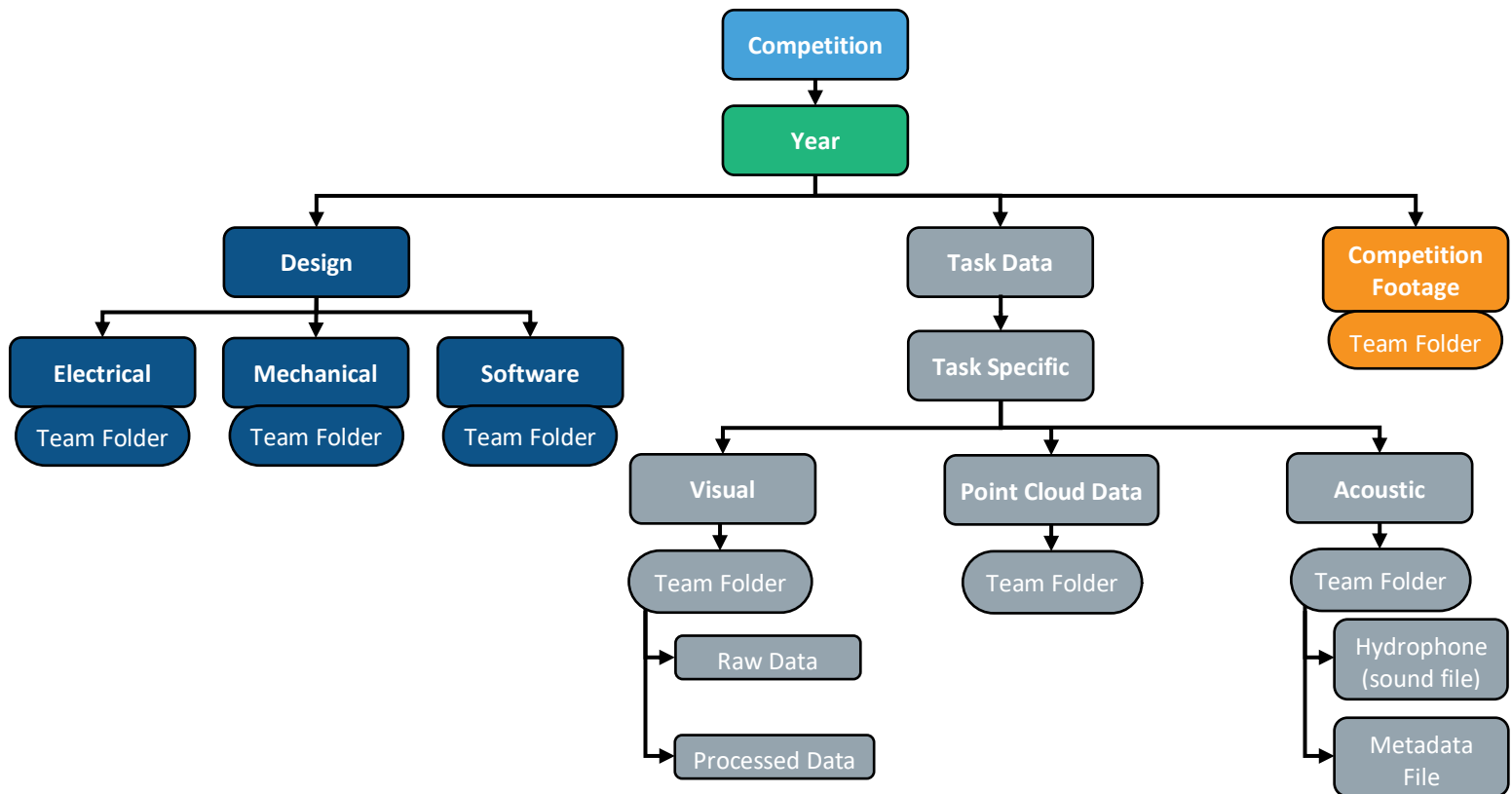


Figure 2: Folder Architecture

6.1 Competition

This data sharing effort is designed to address the need of test data for student competitors participating in the RoboBoat, RoboSub and RobotX competitions.

Data is organized by competition and year. Within the appropriate folders, teams are requested to create a team folder and upload their data.

6.2 Year

The Year folder and its subfolders contain data gathered from the identified year and competition. Tasks are listed based on the tasks/mission for that year.

6.3 Design

The Design folder, and its subfolders, contain data about overall robot design, and any other information that cannot be directly associated with other folders. Such information can include, but not limited to, electrical design and documentation, CAD files, bill of materials, source code, driver files, software documentation, and simulation related data.

6.3.1 Electrical

Only files related to electrical design are allowed in this folder.

Team Folder

During the registration process, teams were asked to provide an abbreviation for the School/Organization name. To upload data in any folder, teams must first create a folder with their Team Abbreviation (not team name). Using this Team Abbreviation will allow other teams to identify the owner of the data.

Once this folder is created, data on electrical ideas, design and implementations can be uploaded, in this folder.

Sharable Content:

PCB design files, schematics, wiring guide, electrical load calculations, motor sizing, and other files of such nature. Any supporting documentation (team processes, read-me, box notes, bill of materials) could also be shared in this folder.

File Type Examples:

gerber files, IPC-2581, ODB++, .pdf

Naming Convention (required):

Description of File_Number in series

Ex: powerDistBoardSchem_1.sch

Note: File name cannot be modified once the file is uploaded.



6.3.2 Mechanical

Only files related to mechanical design are allowed in this folder.

Team Folder

To upload data in any folder, teams must first create a folder with their Team Abbreviation. Once this team folder is created, data on mechanical ideas, design and implementations can be uploaded, in this folder.

Sharable Content:

Mechanical design, CAD (images, drawings, 3D models), machining techniques, analysis (structural, fluid, dynamics), material selection, and other files of such nature. Any supporting documentation (team processes, read-me, box notes, bill of materials) could also be shared in this folder.

File Type Examples:

sldprt, dwg, STEP, IGES, .prt

Note: For 3D CAD files, consider saving the part as a neutral file type so that teams using different CAD programs may easily access shared files.

Naming Convention (required):

descriptionOfFile_Number in series

Ex: hydrophoneMount_1.step

Note: File name cannot be modified once the file is uploaded.

6.3.3 Software

Only files related to software design and architecture are allowed in this folder.

Team Folder

To upload data in any folder, teams must first create a folder with their Team Abbreviation. Once this team folder is created, data on software design, architecture, code and implementations can be uploaded, in this folder.

Sharable Content:

On-board and off-board programs and scripts, software flowcharts, state diagrams, localization/navigation techniques, research documentation, simulation files, and other files of such nature. Any supporting documentation (team processes, read-me, box notes, Universal Robot Descriptor File) could also be shared in this folder.

File Type Examples:

foo.py or baz.cpp.

Note: For code files, please keep the extension of the programming language in the filename.



Naming Convention (required):

descriptionOfFile_Number in series

Ex: gateDetectionCV_1.py

Note: File name cannot be modified once the file is uploaded.

6.4 Task Data

The Task Data folder and its subfolders contain data unique to tasks for the identified year and competition.

6.4.1 Task Specific

Only files related to specific tasks for a particular year are allowed in this folder.

These task data folders will differ with competition as well as the year.

Visual

This folder contains visual media that was captured by the vehicle during operation.

Team Folder

To upload data in any folder, teams must first create a folder with their Team Abbreviation. Once this team folder has been created, data on tasks can be uploaded in this folder. Any supporting documentation (team processes, metadata file, box notes) could also be shared in this folder.

Raw Data (*Suggested sub-folder*)

This folder contains data that was collected from the vehicle and has not been processed yet.

File Type Examples:

jpeg, png, mp4, bag

Naming Convention (required):

Something appropriate _Number in series.jpeg

Ex: front_buoys_1.jpeg

Note: File name cannot be modified once the file is uploaded.

Processed Data (*Suggested sub-folder*)

This folder contains data that was collected from the vehicle and has been post-processed. This processed data can be binned in two categories: Unlabeled and Labeled.

File Type Examples:

jpeg, png, mp4, bag

Naming Convention (required):

Camera Location_Task Element__Number in series.jpeg

Ex: front_buoys_image_1.jpeg

Note: File name cannot be modified once the file is uploaded.

Point Cloud Data

Only point cloud data files, and reference files associated with Light Detection and Ranging (LIDAR), and Sound Navigation and Ranging (SONAR) are allowed in this folder.

Team Folder

To upload data in any folder, teams must first create a folder with their Team Abbreviation. Once this team folder has been created, data sets from point cloud sensors, as well as any metadata files can be uploaded in this folder. Any supporting documentation (team processes, metadata file, box notes) could also be shared in this folder.

File Type Examples:

pcd, bag, XYZI, XYRIR

Note: Please provide additional information (as metadata file) that may serve as a guide for those using this data.

Naming Convention (required):

Task Element_Number in series.bag

Gate_1.bag

Note: File name cannot be modified once the file is uploaded.

Acoustic

Only acoustic (sound) files and associated reference files are allowed in this folder.

Team Folder

To upload data in any folder, teams must first create a folder with their Team Abbreviation. Once this team folder has been created, data on acoustic data as well as the Metadata file (reference file) can be uploaded, in this folder.

Hydrophone *(Suggested Sound sub-folder)*

To ensure sound files are identified with their frequencies, naming convention (as listed below) should be adhered to.

File Type Examples:

.wav

Naming Convention (required):

frequency_datanumber.ext

Ex. 25kHz_13.wav

Note: File name cannot be modified once the file is uploaded.

Metadata File (*Suggested Reference sub-folder*)

Without a reference file, acoustic data can often be hard to decipher (a maelstrom). This reference file should contain location of hydrophone on vehicle (from vehicle origin), with units (mm or in). It should also contain sampling rate, voltage of each of the hydrophones and any filters that may be applied to the data stream.

File Type Examples:

.txt, .docx, .pdf

Naming Convention (required):

Reference File_datanumber.ext

Ex: ReferenceFile_13.txt

Note: File name cannot be modified once the file is uploaded.

6.5 Competition Footage

The Competition Footage folder contains videos recorded during competition, provided by RoboNation. These videos are recorded by divers or videographers in the water and focus primarily on capturing vehicle maneuvers and vehicles interacting with a task element (crossing gate, touching buoys, surfacing and so on).

6.5.1 Team Folder

Video files will be sorted in folders by School/Organization name (when possible). Contents in that folder will only have a numeric naming scheme. (Ex. 1.mp4).

