Data Sharing Guide

Version 1, Updated September 2020

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. As this is a community driven effort, any competition related data can be shared. 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.

For the purposes of this guide, 2017 is used as an example year. Folder structure will vary with tasks and the competition. 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 in this effort.

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.
- This generic email must be used to create a complimentary box.com account for the team.

Data Access
- Only once teams have registered for the upcoming competition will they be given access to the upcoming competition year's data sharing folder.
- Once a competition year ends, registered teams will maintain access to the competition year's folder.
- New teams will gain access to previous competition year's data, 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). Other team members can be provided access by the teams main account through a shared link. This "secondary" access will be Viewer access only.

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

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

4   FAQ's

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

5   Support

This is a community driven effort and any 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 (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.

Person's Name
School Name/Team Name | Data Mod

Figure 1: Data Moderator Tag

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. Rather than uploading the data in the appropriate folder, teams must create a folder with their team name 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).
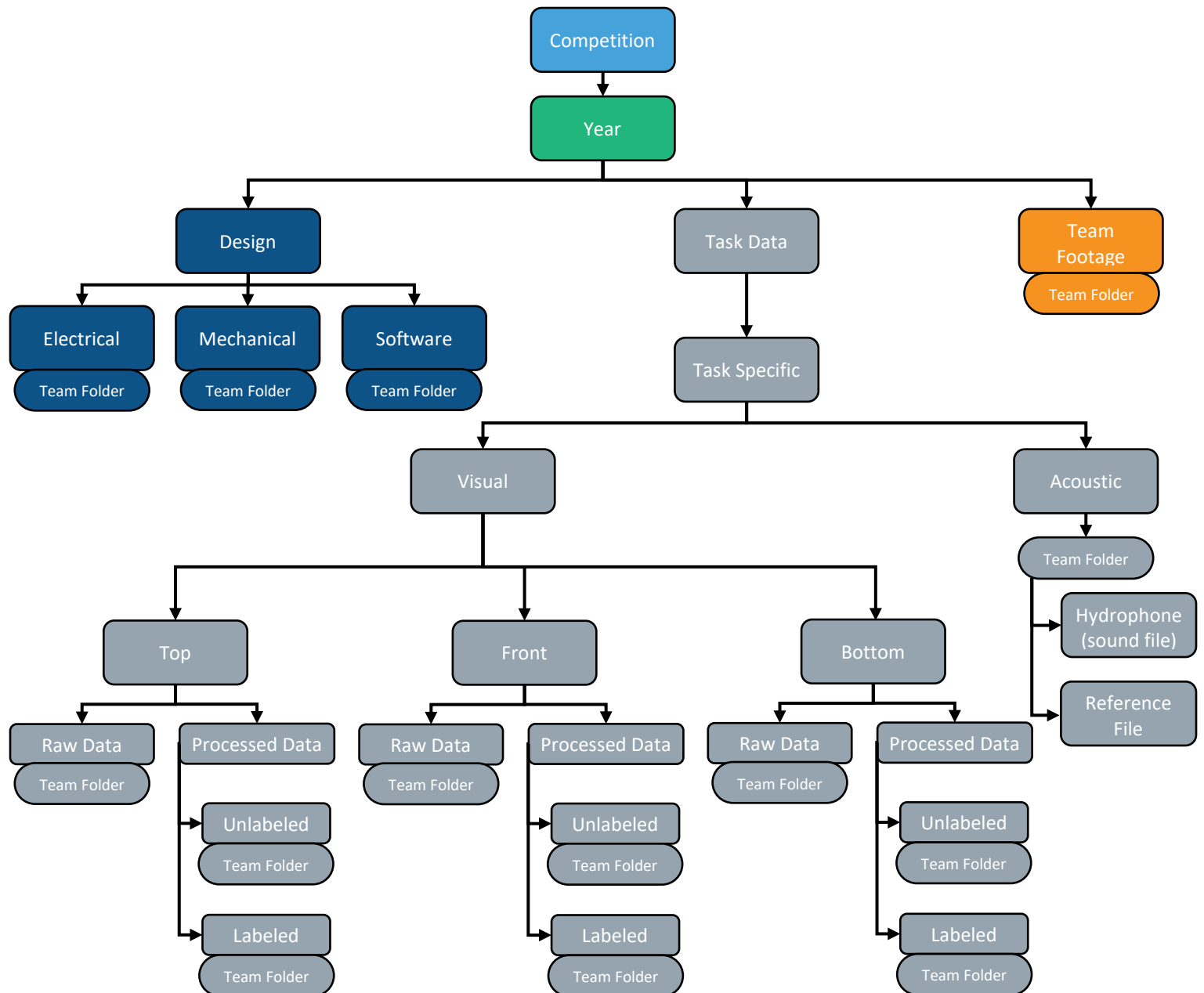

Figure 2: Folder Architecture

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, CAD files, source code, driver files, software documentation, electrical design and documentation.

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/University name. To upload data in any folder, teams must first create a folder with their abbreviated School/University name (not team name). Using this abbreviated School/University name versus team name 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.

File Type Examples:
gerber files, IPC-2581, ODB++, .pdf

Naming Convention (suggested):
Description of File_Number in series
Ex: powerDistBoardSchem_1.sch

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 abbreviated School/University name (not team name). 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.

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 (suggested):
descriptionOfFile_Number in series
Ex: hydrophoneMount_1.step

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 abbreviated School/University name (not team name). 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, and other files of such nature.

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 (suggested):
descriptionOfFile_Number in series
Ex: gateDetectionCV_1.py

6.4 Task Data

The Task Data folder and its subfolders contain data unique to tasks for the identified year and competition. Though the format of the data may be different, all subfolders within the Task Data folder only contain visual, audio and text files (pinger related).

6.4.1 Task Specific

Only files related to specific tasks for a particular year are allowed in this folder. These task data folders can range from 'Gate' to 'Octagon' (and anything in between).

Visual

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

Top – Front – Bottom *(Camera Perspective)*

This folder contains data that was collected by the respective camera from the vehicle (front, bottom, or top).

Raw Data

This folder contains data that was collected from the vehicle and has **<u>not</u>** been processed yet.

Team Folder

To upload data in any folder, teams must first create a folder with their abbreviated School/University name (not team name). Once this team folder is created, raw data on tasks can be uploaded, in this folder.

File Type Examples:
jpeg, png, mp4, bag

Naming Convention (suggested):
Something appropriate _Number in series.jpeg
Ex: front_buoys_1.jpeg

Processed Data

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

Unlabeled

This folder contains stills (or video) that contains the object of interest in the frame.

Team Folder

To upload data in any folder, teams must first create a folder with their abbreviated School/University name (not team name). Once this team

folder is created, unlabeled processed data on tasks can be uploaded, in this folder.

File Type Examples:
jpeg, png, mp4, bag

Naming Convention (suggested):
Camera Location_Task Element__Number in series.jpeg
Ex: front_buoys_image_1.jpeg

Labeled
This folder contains stills (or video) that contains the object of interest in the frame, while also containing a label identifying this object.

Team Folder
To upload data in any folder, teams must first create a folder with their abbreviated School/University name (not team name). Once this team folder is created, labeled processed data on tasks can be uploaded, in this folder.

File Type Examples:
jpeg, png, mp4, bag

Naming Convention:
Camera Location_Task Element__Number in series.jpeg
Ex: front_buoys_image_1.jpeg

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

Team Folder
To upload data in any folder, teams must first create a folder with their abbreviated School/University name (not team name). Once this team folder has been created, data on acoustic data as well as the hydrophone reference file (location of hydrophone on vehicle) can be uploaded, in this folder.

Reference File (Specification File)
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 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 (suggested):
Reference File_datanumber.ext
Ex: ReferenceFile_13.txt

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

File Type Examples:
.wav

Naming Convention:
frequency_datanumber.ext
Ex. 25kHz_13.wav

6.5 Team Footage

The Team 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/University name (when possible). Contents in that folder will only have a numeric naming scheme. (Ex. 1.mp4).