

CAD

Learn everything you need to be a competent CADDER on 3506 YETI Robotics!

- Getting Started with Robot Design
 - What you need to install
 - Creating a Gearbox
- Getting Started With CacheCAD

Getting Started with Robot Design

This chapter details what software you need to install to design our robots and some basic exposure to CAD Software

What you need to install

SOLIDWORKS

SOLIDWORKS is a popular CAD (computer-aided design) software used for product development. We use SOLIDWORKS to design, simulate, and manufacture our robots. You can download SOLIDWORKS using the instructions in the pinned message of the CAD channel in the YETI discord.

CacheCad

Created by FRC team 8096 Cache Money this software allows FRC teams to collaborate and share CAD files via Google Drive. This greatly speeds up the design process. You can [download CacheCad here](#).

Read this if you use a mac or Linux machine.

Unfortunately you can only run SOLIDWORKS on Microsoft Windows operating systems so if you are currently using a Mac Machine you need to use bootcamp until you are ready to purchase a windows laptop. If you are currently running Linux you need to download a Microsoft Windows operating system like Windows 10.

Next Steps

Learn basic CAD skills from [Solid Professor](#). Also learn FRC specific skills in the next chapter of creating a gearbox.

Creating a Gearbox

Find a 2x1 from WCP

Go to the [Punched Tubing](#) tab in the WCP website. Navigate to WCP-1025 in the CAD & Drawings section. Then click the grey link called "STEP".

Find other parts

Using the same search method find the following and put all of the files into a folder named: "Stage 1 - Gearbox"

- 1.) Kraken X60 Powered by TalonFX
- 2.) 50t Aluminum Spur Gear (20 DP, 3/8" Hex Bore) (WCP-0698)
- 3.) 12t Steel Spur Gear (20 DP, 8mm SplineXS Bore) (WCP-1010)
- 4.) .159" ID x .500" OD Rounded Hex Stock (36") (WCP-0914)
- 5.) 0.500" Hex ID x 1.125" OD x 0.313" WD (Flanged Bearing) (WCP-0783)

If you are having trouble finding parts just search (ctrl-f) the parts number (EX:WCP-0000).

-IN PROGRESS-

Getting Started With CacheCAD

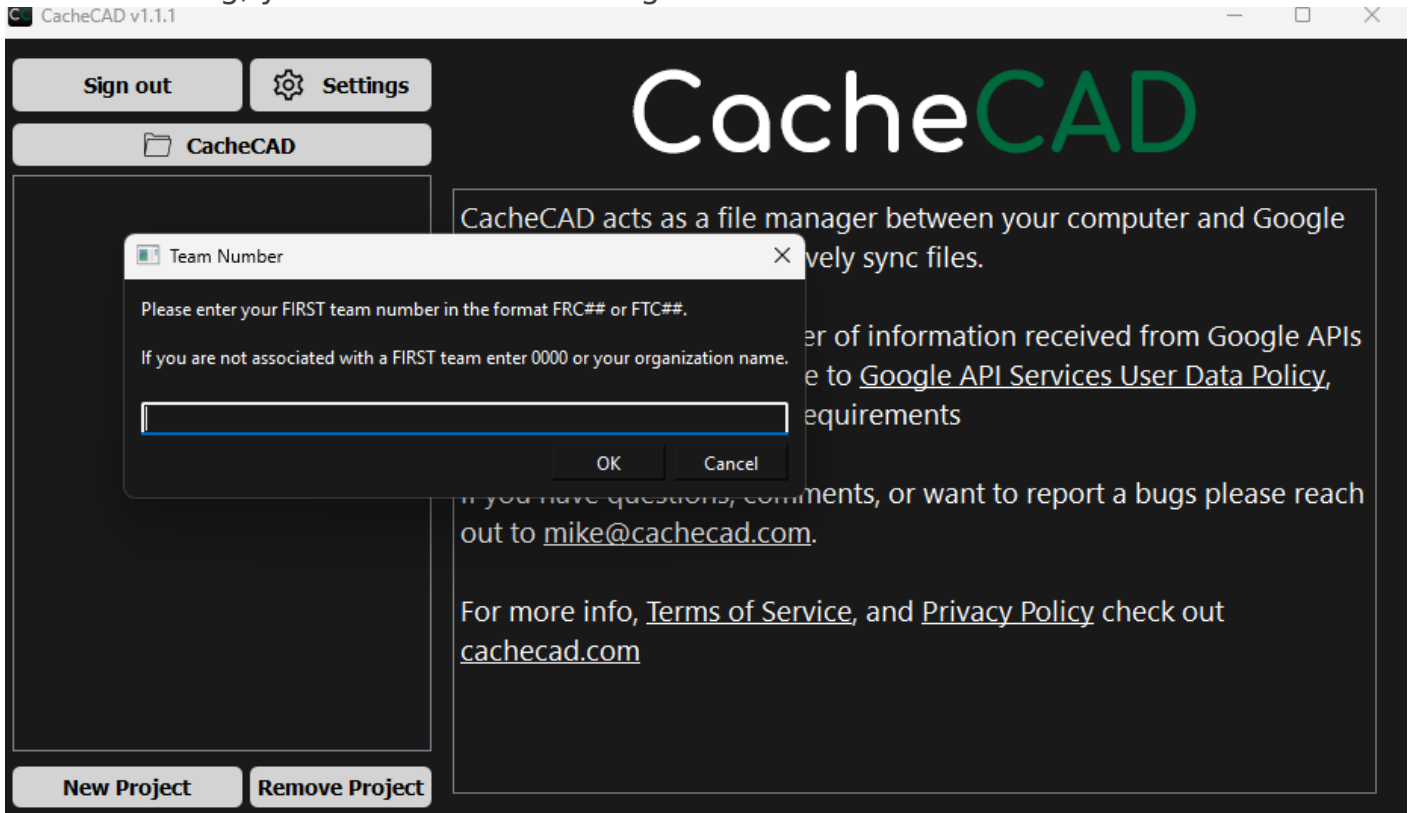
CacheCAD is what we use to manage our files in solidworks. Here is how to use it effectively.

1. Installation

Use this installation link:

https://drive.google.com/file/d/1BaY2dzd9njdK8UrvhdGPG2CIQ6J_iNNR/view

After installing, you should see this image:

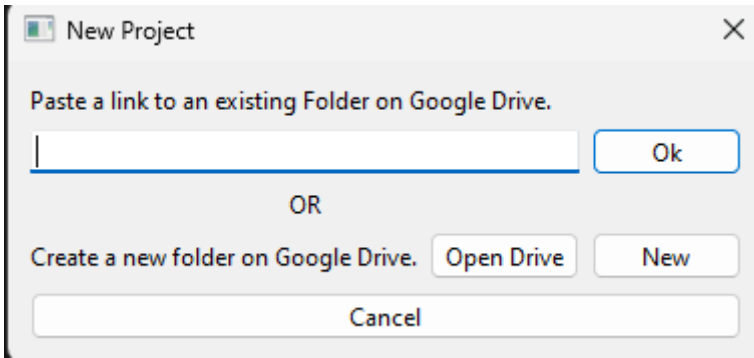


Type "FRC3506" in the field (or FRC{your team number} if you are not on YETI Robotics).

Make sure to sign in with your google account in the top left or when prompted.

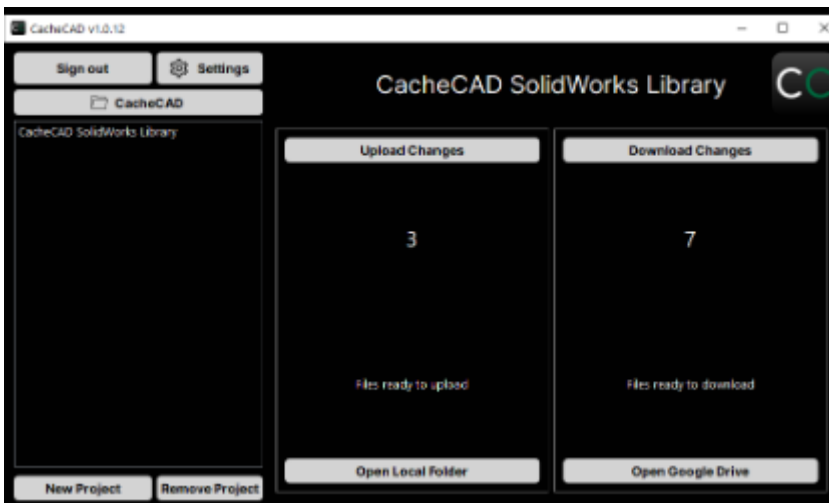
2. Making Projects

A project allows us to manage our files with google drive. In order to make a project, click "new project" and paste a google drive folder link to the field here:



3. Managing Projects

After making a project, it should appear in your left menu. Double click it to see something like this:



Upload Changes - Changes that you have made in Solidworks and have not gone to the Google Drive yet.





Download Changes - Changes other people have made and you have not downloaded yet.

Before working, **ALWAYS DOWNLOAD CHANGES!** This prevents your work from being overridden by others, which is incredibly frustrating. If you can, download at home to save bandwidth at robotics.

In order to save something to CacheCAD, it must be saved locally in your CacheCAD folder, then your Project folder! To access this, click the "[CacheCAD]" button in the top left of the CacheCAD UI, which will take you to the main CacheCAD folder.

To access an individual project's folder, click "Open Local Folder" in the bottom middle. When saving from SOLIDWORKS, always "save as" and navigate to this project folder when saving, or it will not upload it when you upload changes!

When clicking upload and download changes, you can select which changes you would like to make by ticking the boxes. There will be 4 icons next to the changes, which are the following:

	New Item	This is used when you are uploading an item that doesn't exist on Google Drive, or downloading an item that doesn't exist on your computer.
	Revision	This is used when you are uploading a revision to Google Drive or downloading a revision to your computer. This overwrites the file you currently have in that location. Google saves previous versions of your files on drive for 30 days by default but this can be changed to keep forever.
	Delete	In the upload menu, CacheCAD will show items to delete when a file you have previously uploaded or downloaded with CacheCAD is removed from your computer. Similarly, a file that has been deleted from Drive but not your computer will show on the download menu.
	Mismatch	CacheCAD can't determine whether the files on your computer or the files on Google Drive are newer. This shows up on both upload and download menus the same. These files are unchecked by default so you won't accidentally overwrite.

Double check the symbols before messing with files.

If it was not clear before, **ALWAYS DOWNLOAD YOUR CHANGES BEFORE WORKING!** I cannot stress this enough, work will be deleted when you do not download changes.

When in doubt, ask a veteran, mentor, or see the user guide [here](#).