Beginner's Guide

Mayank Mittal, Manish Kumar, Akash Jain
AUV-IITK

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1 SolidWorks- CAD Software

Installation of SolidWorks

SolidWorks takes 7 GB of space on standard installation. A minimum of 1GB disk space is recommended on the system running SolidWorks for storing all the files. The software and a parallel three tab Google Chrome (for tutorials) was found to run without glitches on a laptop with the following specs:

1. 1.9 GHz Intel Core i5 (4th gen) processor
2. 4GB DDR3 RAM
3. 512 MB Intel Integrated Graphics

SolidWorks does not work on Unix based platforms such as OSX or Linux.
For greater ease of use it is advised to use a mouse, although it is not impossible to use just a keyboard and a track-pad.
If you are using windows 10 do not install SW electrical because it leads to error while installation.

SolidWorks Tutorials

Specific needs of the mechanical designing team has been kept in mind while selecting tutorials to do.

1. Basics Sketching
   https://www.youtube.com/watch?v=C9Oc0wl-nVY
2. Designing of an Engine Piston
   https://www.youtube.com/watch?v=ebOc08Fscvw
3. 3-D Modeling and Rendering
   https://www.youtube.com/watch?v=vufILF2_DNs

4. Modifying Sketches (try to do this in 2nd part)
   https://www.youtube.com/watch?v=C9Oc0wl-nVY
5. Making Orthographic views from 3-D model (try to do this in 2nd part)
   https://www.youtube.com/watch?v=WEkF8oINyKY
6. Sheet Metal
   https://www.youtube.com/watch?v=EYogvIvkQMM
7. https://www.youtube.com/channel/UCCnuNT5grwRIzY4XHfFgnhA
8. https://www.youtube.com/channel/UCtwaWPOXEBysZLh1rrPzwFw

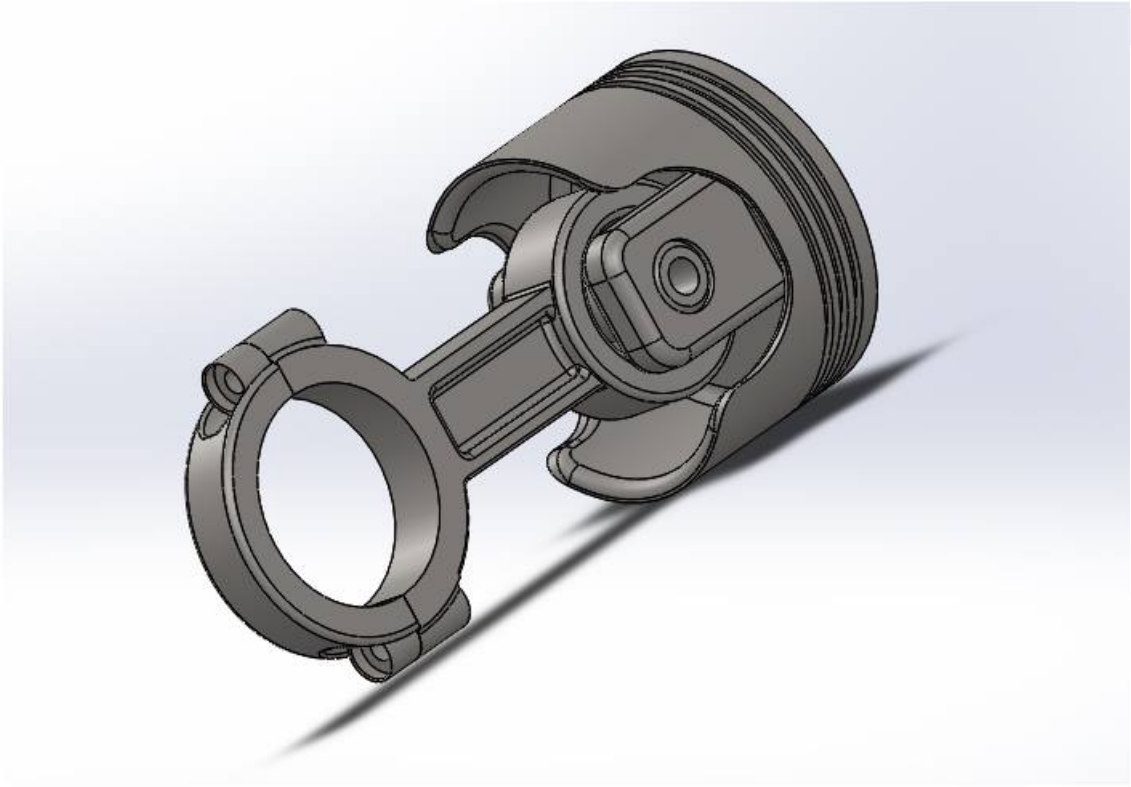

Figure 1: Tutorial 2: Engine Piston

2 Git Version Control

Git is a wildly-used version control system in for software development. It is a distributed revision control system with an emphasis on speed ,data integrity, and support for distributed, non-linear work flows. Git was initially designed and developed in 2005 by Linux kernel developers for Linux kernel development.

To simplify the above rather formal definition we can say Git allows groups of people to work on the same documents (often code, in our case we are going to use it for designing too) at the same time, and without stepping on each other's toes. It's a distributed version control system.

Installation

To start with, open a new termincal on Linux and type the command:

```
$ sudo apt-get install git
```

This creates the required Git environment in our Linux distribution.

For working in a team we use a common git repository in www.github.com and there we create our own branches and work on our part of the system. When the final decision is taken we merge the desired branch to the master and thus we can build our main working tree. Other works or suggestions remain in the branches always for testing and for using as other options. We can clone the master in our personal repositories and go on working with it.

Those who would be using Windows for their main work need to get familiar with Git Shell and the GUI available for Windows.

Git Tutorials

1. https://try.github.io/levels/1/challenges/1
2. http://rogerdudler.github.io/git-guide/
3. https://guides.github.com/
4. https://github.com/AUV-IITK/learning_git/blob/master/README.md

```
Create a account on github

Join AUV-IITK on github

Apply for student developer pack

Fork this repo https://github.com/AUV-IITK/learning_git to your account.

Clone the repo to your machine

Make a new branch called "add/your-name"

Make a new file named "your-name"

Commit it.

Make a new directory with "your-name" and some random files in it.

Commit it.

At this point you must have added a new branch and made 2 commits in it.

Now push this branch to your fork on your github account.
```

Figure 2: Tutorial 4 `README.md` File

Frequently Used Commands

Now for future convenience following is a compilation of useful Git commands and their applications which may be helpful for future in the project:

`add`	Add file contents to the index
`bisect`	Find by binary search the change that introduced a bug
`branch`	List, create, or delete branches
`checkout`	Checkout a branch or paths to the working tree
`clone`	Clone a repository into a new directory
`commit`	Record changes to the repository
`diff`	Show changes between commits, commit and working tree, etc
`fetch`	Download objects and refs from another repository
`init`	Create an empty Git repository or reinitialize an existing one
`log`	Show commit logs
`merge`	Join two or more development histories together
`pull`	Fetch from and integrate with another repository or a local branch
`push`	Update remote refs along with associated objects
`rebase`	Forward-port local commits to the updated upstream head
`reset`	Reset current HEAD to the specified state
`show`	Show various types of objects
`status`	Show the working tree status
`tag`	Create, list, delete or verify a tag object signed with GPG

3 LaTeX- Document Preparation System

LaTeX (pronounced ”Lah-tech” or ”Lay-tech”) is a high-quality typesetting system. It includes features designed for the production of technical and scientific documentation. LaTeX is the de-facto standard for the communication and publication of scientific documents.

As a part of this assignment, open the folder here and read the documentation of LaTex in the file `Introduction.pdf`. You would have to submit this assignment in form of a softcopy documentation with template as available here.

4 i3wm- Tiling Tool For Linux

In this, you have to install i3 window manager. It is a cool window manager tool for Linux in which you can tile all terminals, editor, browsers on your workspace screen. It is very handy during coding and testing purposes. However, there are too many shortcuts which you need to remember.

Basically the tasks as this part of tutorial is to:

1. Install i3 window manager on your linux platform
2. Configure the function keys and other utilities (such as changing IP settings,volume, brightness etc) by writing bash scripts for the same.

Here is a nice documentation for your reference.