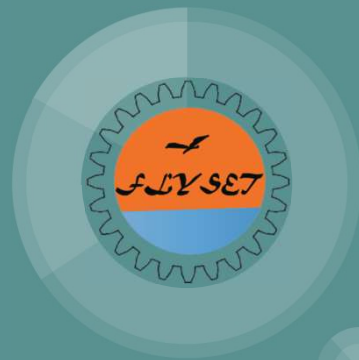


2018 FLYSET FTC Workshop

- CAD Tips and Tricks

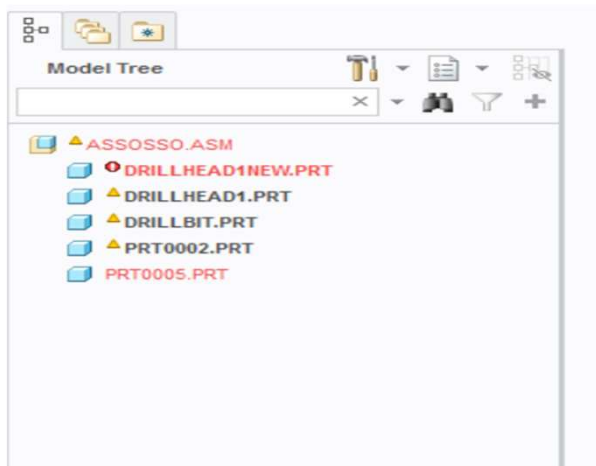
(9/3/2018)



Windchill



Missing Components



Common problem where PTC requires you to retrieve missing components.

Manually select where those pieces are stored on your PC



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PTC Windchill



windchill®

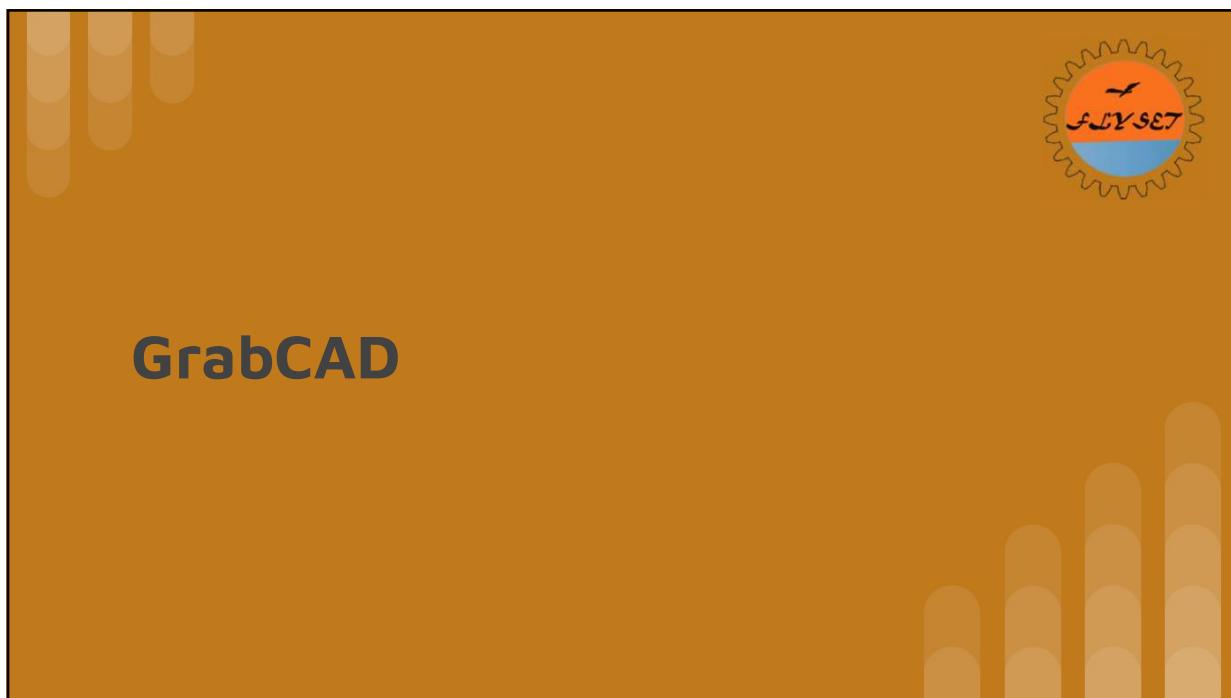
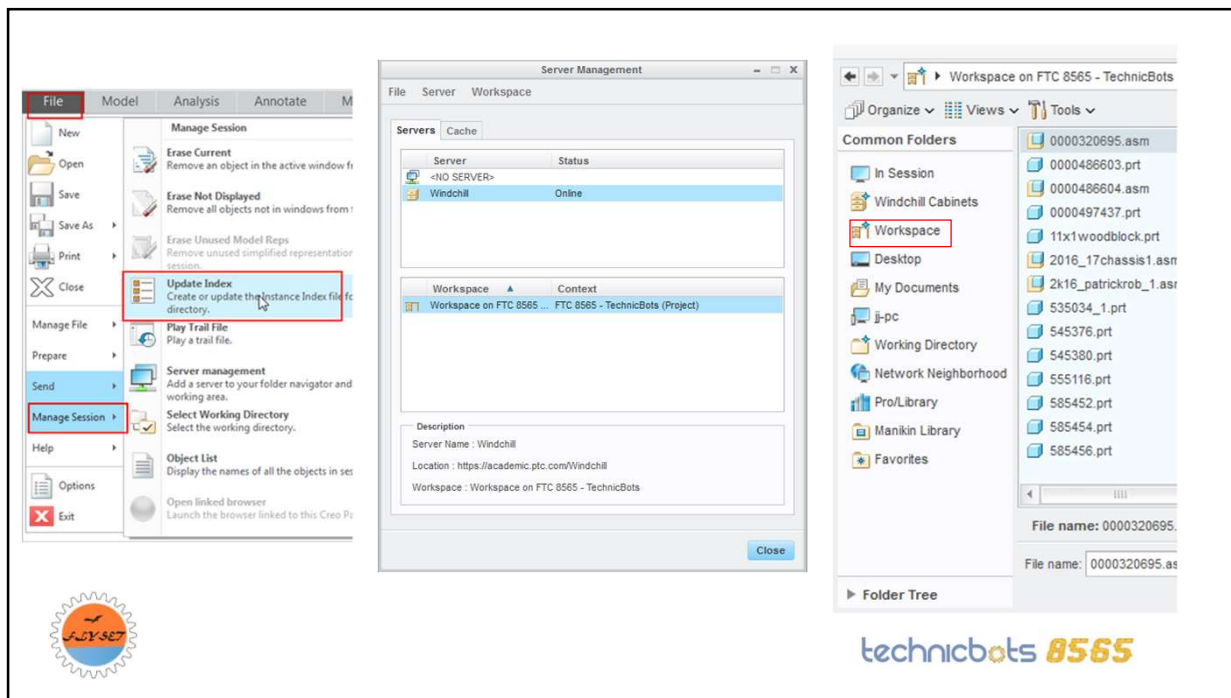
A [Product Lifecycle Management](#) (PLM) software product that is offered by [PTC](#).

A similar project manager like GrabCAD, but more advanced.

Apply for an account on Windchill server on the PTC Windchill website.



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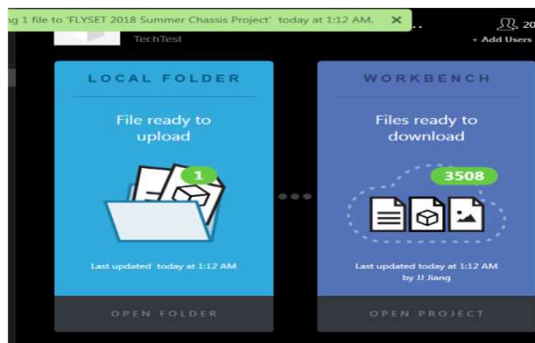




GrabCAD

Benefits-

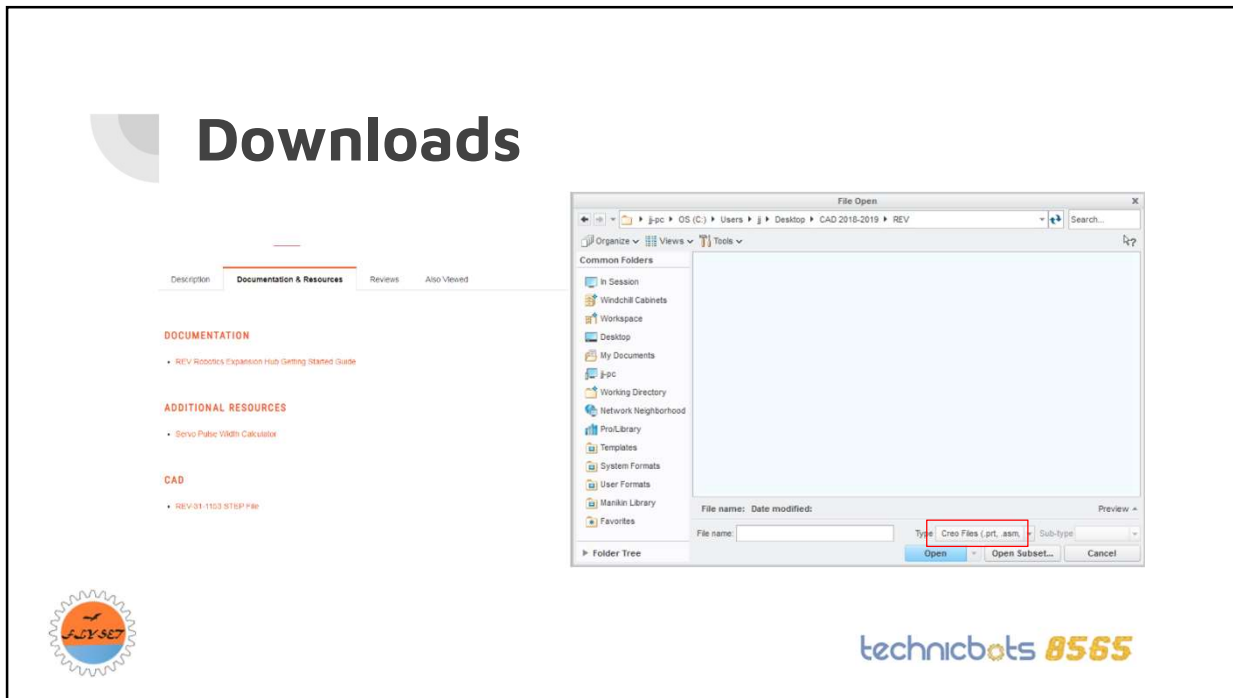
- Instantaneous upload and automatic updating of any changed files
- Increased collaboration between team members
- Easily shows who edited a file and how that file was changed
- Dropbox of CAD





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REV Robotics Assembly

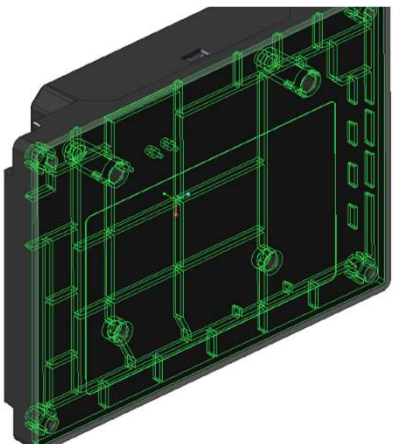
Downloads



The image shows a website interface with a 'Downloads' section. The website has a navigation bar with 'Description', 'Documentation & Resources', 'Reviews', and 'Also Viewed'. Under 'Documentation & Resources', there are three categories: 'DOCUMENTATION' with a link to 'REV Robotics Expansion Hub Getting Started Guide', 'ADDITIONAL RESOURCES' with a link to 'Servo Pulse Width Calculator', and 'CAD' with a link to 'REV-01-1103 3TREP Pkg'. To the right, a 'File Open' dialog box is open, showing a file explorer view of the 'REV' folder on the desktop. The dialog box has a search bar, a file list, and a 'File name' field. The 'File name' field contains 'Type: Creo Files (.prt, .asm)' and 'Sub-type'. The 'Open' button is highlighted.





Invalid Constraints

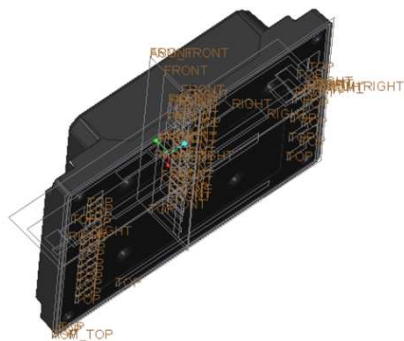



Irregular design of REV components results in "constraint invalid errors"

The image shows a 3D model of a REV component, likely a servo motor or expansion hub, with a complex internal structure. The model is rendered in a dark color with green lines representing constraints. The text to the right of the model states: "Irregular design of REV components results in 'constraint invalid errors'".



Plane View



Under the  Select plane view only. This will allow you to see the specific planes to constraint.

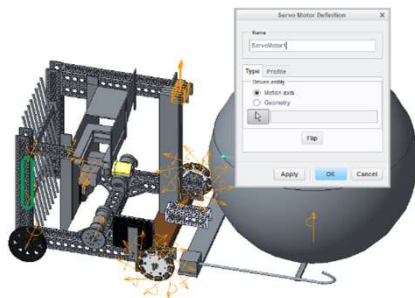


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Animation



PTC Animation - Servos



Every moving piece in an animation is a **Servo**.

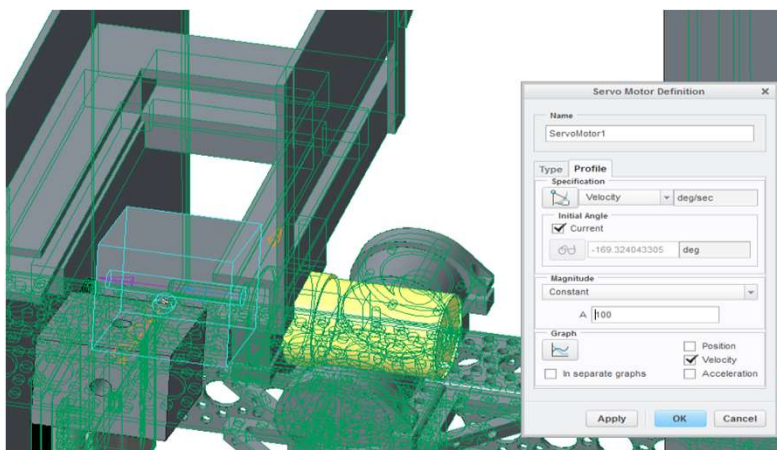
Defining servos

- Velocity, acceleration, position
- Positive/Negative



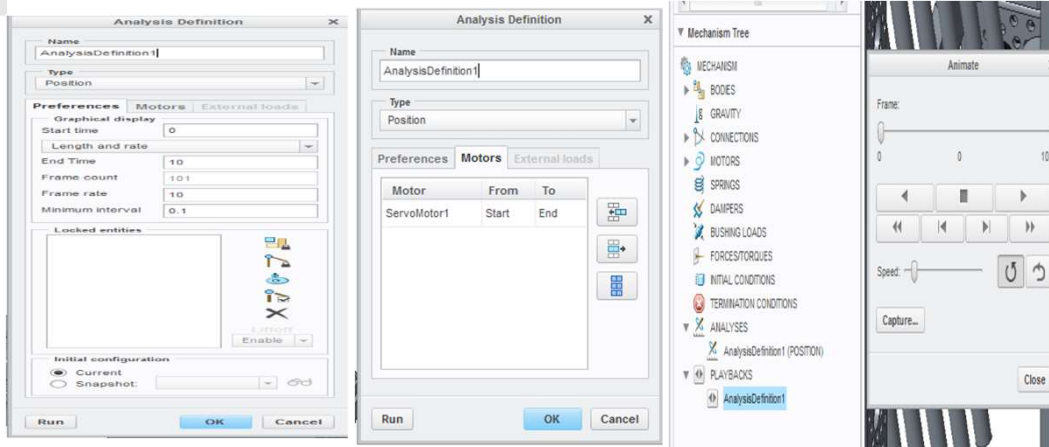
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PTC Animation - Servos



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PTC Animation - Mechanism Analysis

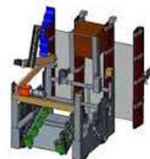


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PTC Animation - Servos



Fig. 113



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Autodesk 3DS Max



Advanced in comparison to Creo

Movement is much more fluid and intuitive

Difficult to use-

- Assembling Issue
- Re constraining



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8565 CAD Resources on Dropbox





Visit our Dropbox for CAD resources

<https://tinyurl.com/8565CAD>

- REV converted KOP for PTC Creo
- Actobotics converted KOP for Actobotics
- Cable Box Model
- Phone Holder Model



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Chassis Model in Fusion 360



Amanda He

- Joined 2013
- Senior at Plano West Senior High School
- Has been a part of programming, building, and CAD modeling
- Currently focused on CAD
- Scouting Lead
- Career aspirations: Product Designer



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CAD Tool Comparisons

PTC, Fusion 360, Autodesk inventor

PTC Creo	Autodesk Inventor	Fusion 360
<ul style="list-style-type: none"> → Compatible with Creo parts → Multiple, concise constraints → Most advanced features, used more in higher level design 	<ul style="list-style-type: none"> → Compatible with Creo and STEP parts (may have issue with Creo) → Simpler constrainting 	<ul style="list-style-type: none"> → Compatible with Creo and STEP parts (may have issue with Creo) → Simpler constrainting → Most user-friendly → Aesthetically appealing → Collaborative



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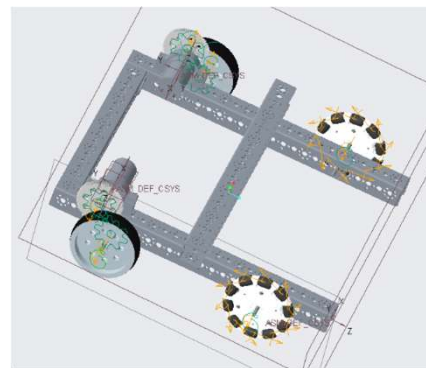
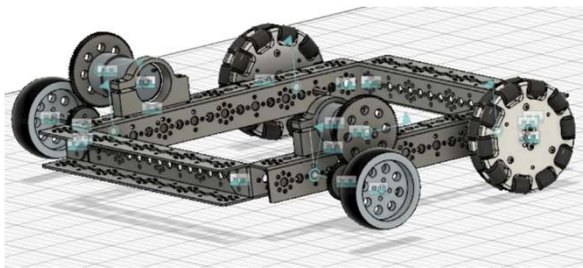
Basic Fusion 360 Essentials for Chassis Modeling

- STEP file KOP on Vendor's websites
- Joints: Rigid, Revolute
- Quick simulations: animate joint, animate model



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2 Wheel Geared Drive Chassis



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Autodesk Geared Drive with Omni Issues Still Open

- Autodesk Inventor
 - Inability to see thumbnails
- Autodesk Fusion 360
 - Inability to see thumbnails
 - Issue with moving parts after enabling contact



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