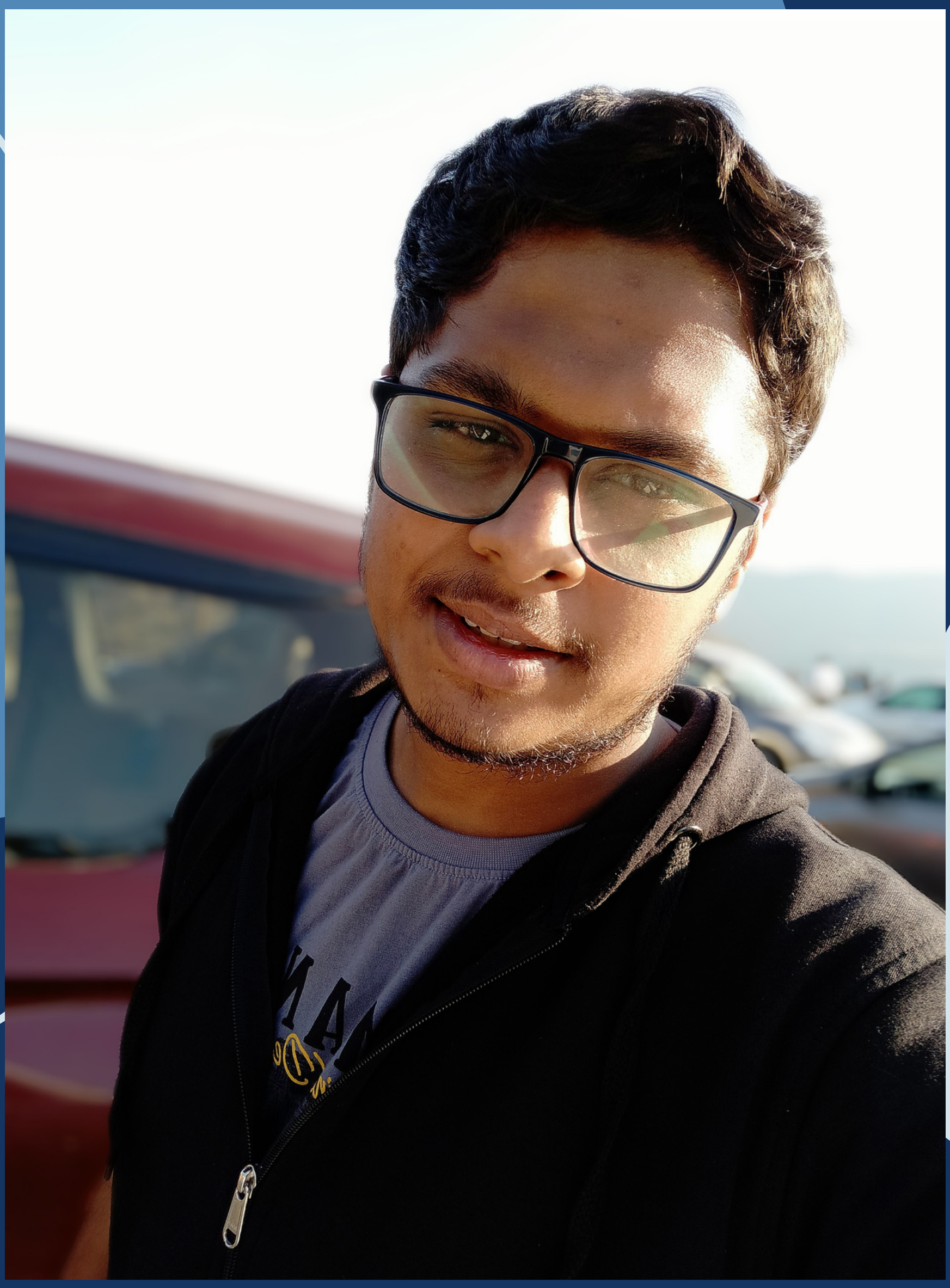
PORTFOLIO

A Collection of my Project Work in the Diploma and Degree. The portfolio shows the important projects.



ABOUT ME

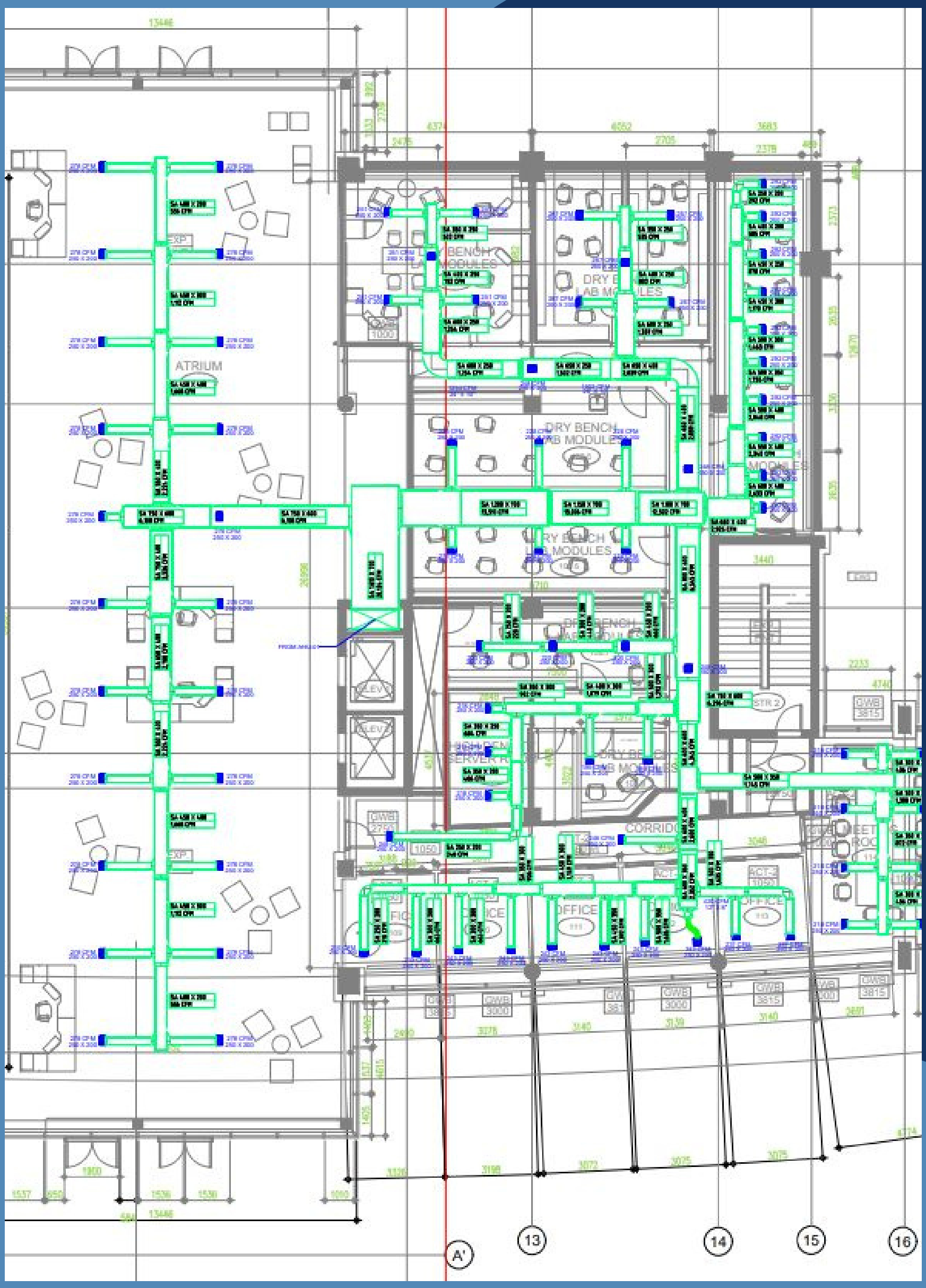
Welcome to Saad Khan's Engineering Project Portfolio, a testament to innovation, dedication, and expertise in the field of mechanical engineering. As a proficient B.Tech graduate with a diploma in the same domain, I have continuously nurtured a profound passion for Computer-Aided Design (CAD), driving me to embark on a diverse range of projects that showcase my proficiency and creativity in this dynamic field.

My passion for the CAD field was ignited during my academic years, and it has only grown stronger ever since. Proficient in utilizing cutting-edge CAD software, I have effectively transformed conceptual ideas into realistic, functional designs. From intricate machine components to complex structural assemblies, my expertise in CAD has enabled me to engineer sophisticated solutions that transcend the boundaries of imagination.

Within this portfolio, you will find a diverse array of projects that exemplify my capabilities as a mechanical engineer. Each project embodies a unique set of challenges that demanded innovative solutions, pushing me to think outside the box. My commitment to delivering excellence shines through in every design, analysis, and simulation conducted throughout the projects.

PROJECTS

01



HVAC System Design for a Research Laboratory situated in Cairo, Egypt

ASHRAE®

What?

- Designing a HVAC System for Research Lab in Egypt.
- **ASHRAE Design Competition 2023**
- Biological Facility
- Building Area - **2,515 Sq. m**

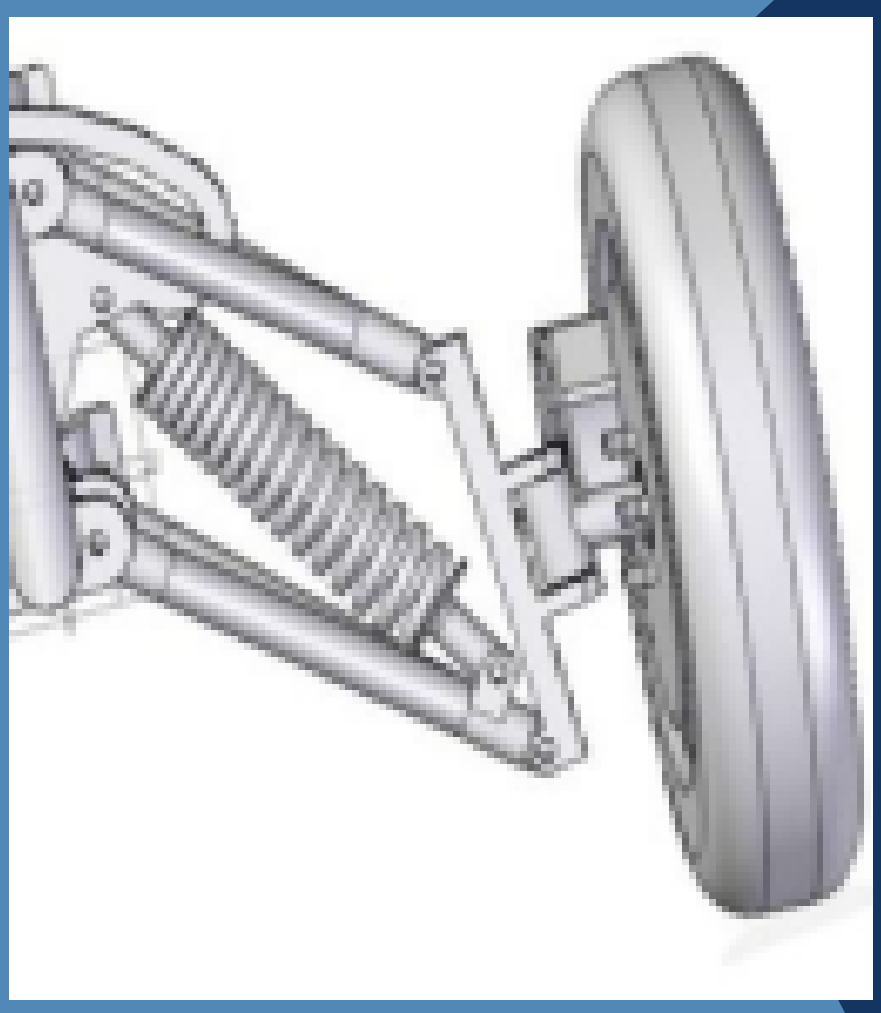
Awards:

- **First Prize** in ASHRAE Mumbai's Regional Level Paper Presentation Competition
- **Third Prize** in ASHRAE International Level Paper Presenation

How?

- Data Interpretation
- Heat Load Calculation
- Equipment Selection
- Life Cycle Cost Analysis
- HVAC System Drafting
- Duct Design
- Hydronic System Design

02



Design and Fabrication of Electric Tilting Trike

What?

- Tilting trike with Electric Bike Arrangement
- In order to counter the problem of cornering in Road Accidents
- Aid Handicapped People.

Results:

- Was Able to attain a lean angle of 45 degrees at the front side
- The Electric Bike System was a success
- The Testing of the model of successful

How?

- Designed the CAD Model of the Parallel link Model
- Procured the Materials
- Fabricated the Model
- Attached the EV Bike Set to the Bike
- Attached Suspension system

03

77516	Bachelors	13	Never-married	Adm-clerical
83311	Bachelors	13	Married-civ-spouse	Exec-managerial
15646	HS-grad	9	Divorced	Handlers-cleaners
34721	11th	7	Married-civ-spouse	Handlers-cleaners
38409	Bachelors	13	Married-civ-spouse	Prof-specialty
84582	Masters	14	Married-civ-spouse	Exec-managerial
60187	9th	5	Married-spouse-absent	Other-service
09642	HS-grad	9	Married-civ-spouse	Exec-managerial
45781	Masters	14	Never-married	Prof-specialty
59449	Bachelors	13	Married-civ-spouse	Exec-managerial
80464	Some-college	10	Married-civ-spouse	Exec-managerial
41297	Bachelors	13	Married-civ-spouse	Prof-specialty
22272	Bachelors	13	Never-married	Adm-clerical
05019	Assoc-acdm	12	Never-married	Sales
21772	Assoc-voc	11	Married-civ-spouse	Craft-repair
45487	7th-8th	4	Married-civ-spouse	Transport-moving
76756	HS-grad	9	Never-married	Farming-fishing
86824	HS-grad	9	Never-married	Machine-op-inspc
28887	11th	7	Married-civ-spouse	Sales
92175	Masters	14	Divorced	Exec-managerial
93524	Doctorate	16	Married-civ-spouse	Prof-specialty
02146	HS-grad	9	Separated	Other-service
76845	9th	5	Married-civ-spouse	Farming-fishing
17037	11th	7	Married-civ-spouse	Transport-moving
09015	HS-grad	9	Divorced	Tech-support

Development of Regression Model to predict fatigue crack growth

What?

- Develop a Model to predict Fatigue Crack Growth
- Test the Data

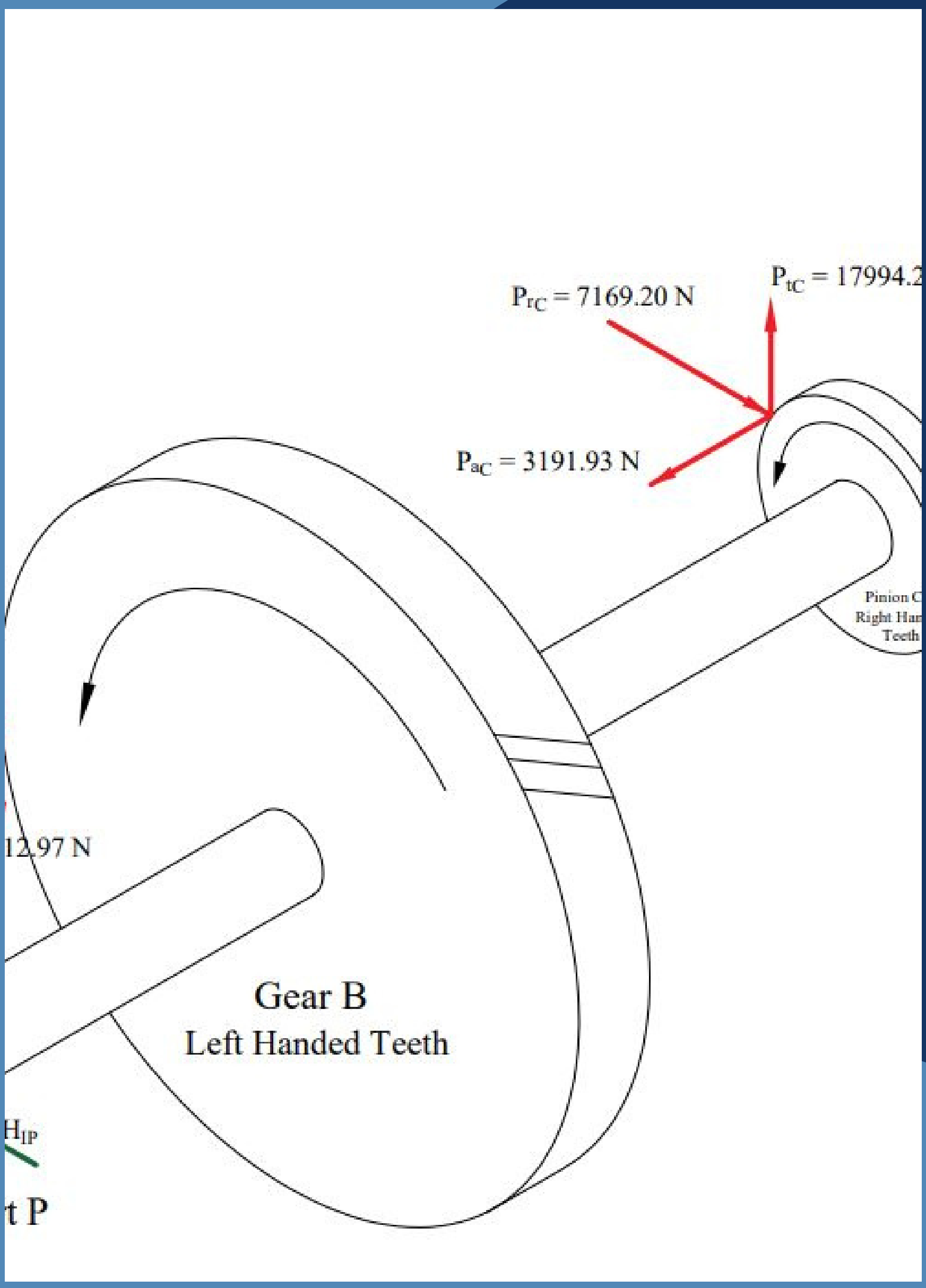
Awards:

- **Second Prize** in the class of "Fundamentals of AI and ML" for showing brilliance in making the accurate model to predict the Crack Gro
- **Third Prize** in ASHRAE International Level Paper Presenation

How?

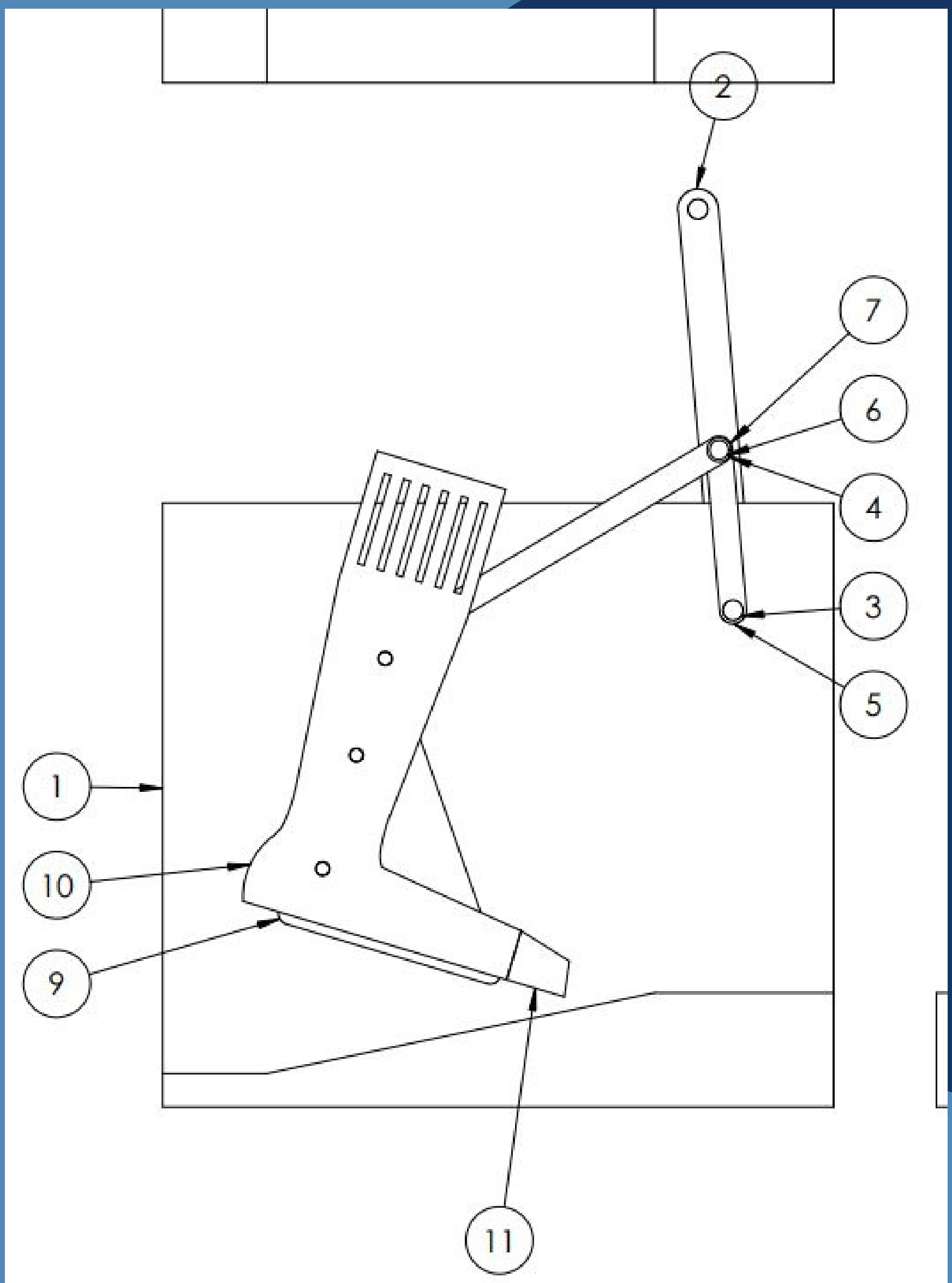
- Using Polynomial Variate Regression Model, pointed out different parameters

04



Design and Modelling of Differential Gearbox

05



Design and Modelling of Army Footwear Testing Mechanism

06

Bevel Gear Design Calculation

Name	Saad Khan
Registration Number	M2020001

Given

r No.	Item	Symbol	Units	Pinion	Gear
1	Module	m	mm	6	
2	Shaft Angle	Σ	Degree	90	
3	Pressure Angle	α	Degree	20	
4	Power	P_w	KW	6	
5	Speed	N_p	RPM	600	
6	Tensile Strength	UTS	MPa	750	750
7	Bending Strength	σ_b	MPa	250	250
8	Face Width	b	mm	50	
9	Surface Hardness	BHN		350	
10	Teeth	z		30	45
11	Dynamic Load Capacity	C	MPa	11400	
11	Pitch Circle Diameter	D	mm	180	270
12	Service Factor	C_s		1.5	

Bending Strength

1	Pitch Cone Angle	ϒ	Degree	33.69006753
2	Virtual Number of Teeth	z'		36.05551275
3	Cone Distance	A_o	mm	162.2498074
4	Lewis Form Factor	γ	mm	0.376694295
5	Bending Strength	S_b	MPa	**19545.72213**

Wear Strength

Spreadsheet to Calculate Stresses on a Bevel Gear

07

MS-Excel Spreadsheet to Calculate Stresse

By Khan Saad Sameer - M202020001 | Secon

Write the Values of the Following: | *Magnitude of Tr*

3-

σx (Normal Stress in X-Direction)	100.00
σy (Normal Stress in Y-Direction)	-50.00
σz (Normal Stress in Z-Direction)	-50.00
τxy (Shear Stress in XY-Direction)	100.00
τxz (Shear Stress in XZ-Direction)	100.00
τyz (Shear Stress in YZ-Direction)	100.00

$|Tn_x|$

$|Tn_y|$

$|Tn_z|$

|Tn|

Tn

Direction Cosines	*Value*
nx	0.5773
ny	0.5773
nz	0.5773
Sum of Squares of	1.0

Magnitude of N
Arbitrarily O

|σn|

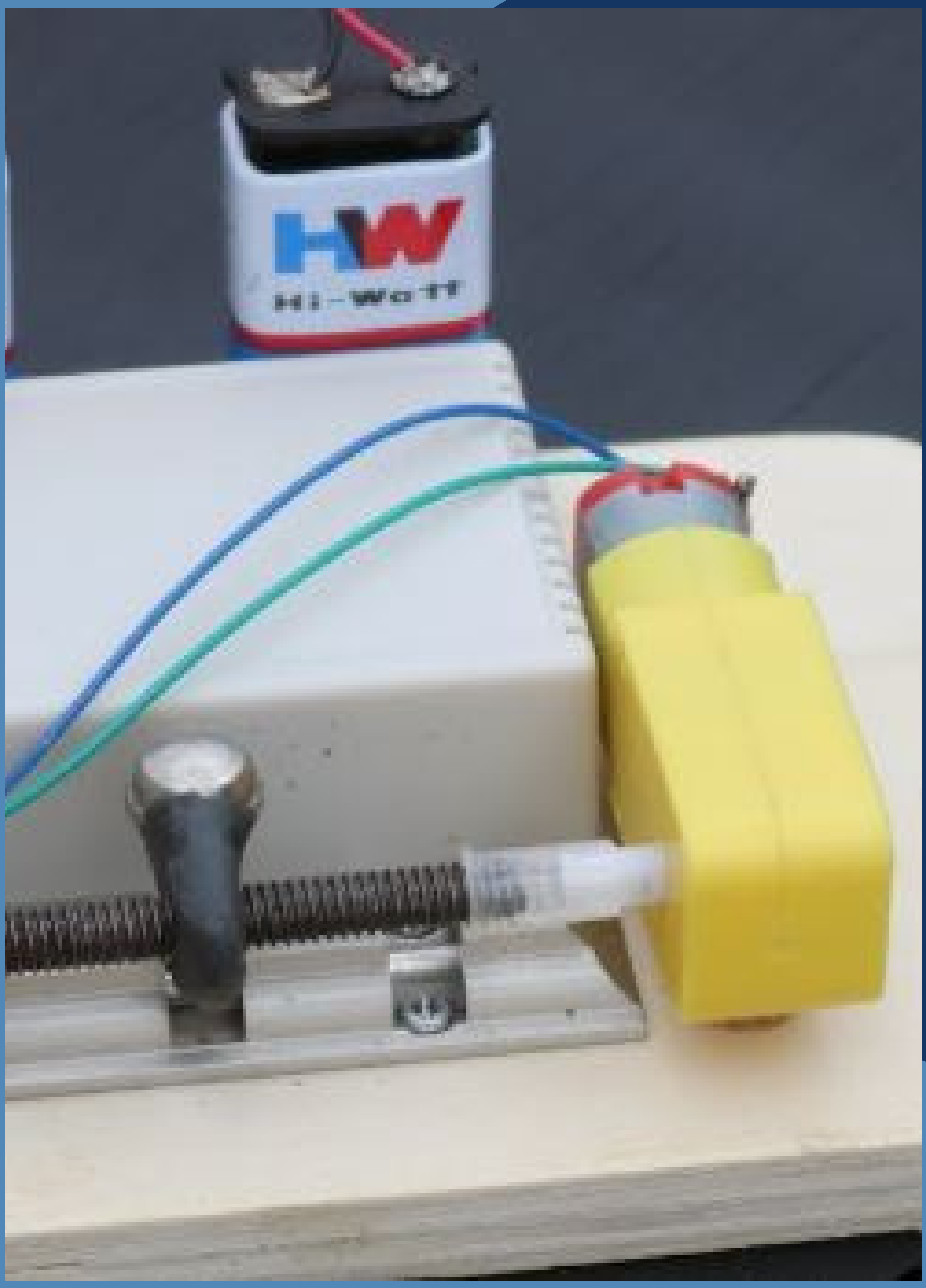
σn

Spreadsheet to Calculate Stresses on a Arbitrarily Oriented Plane

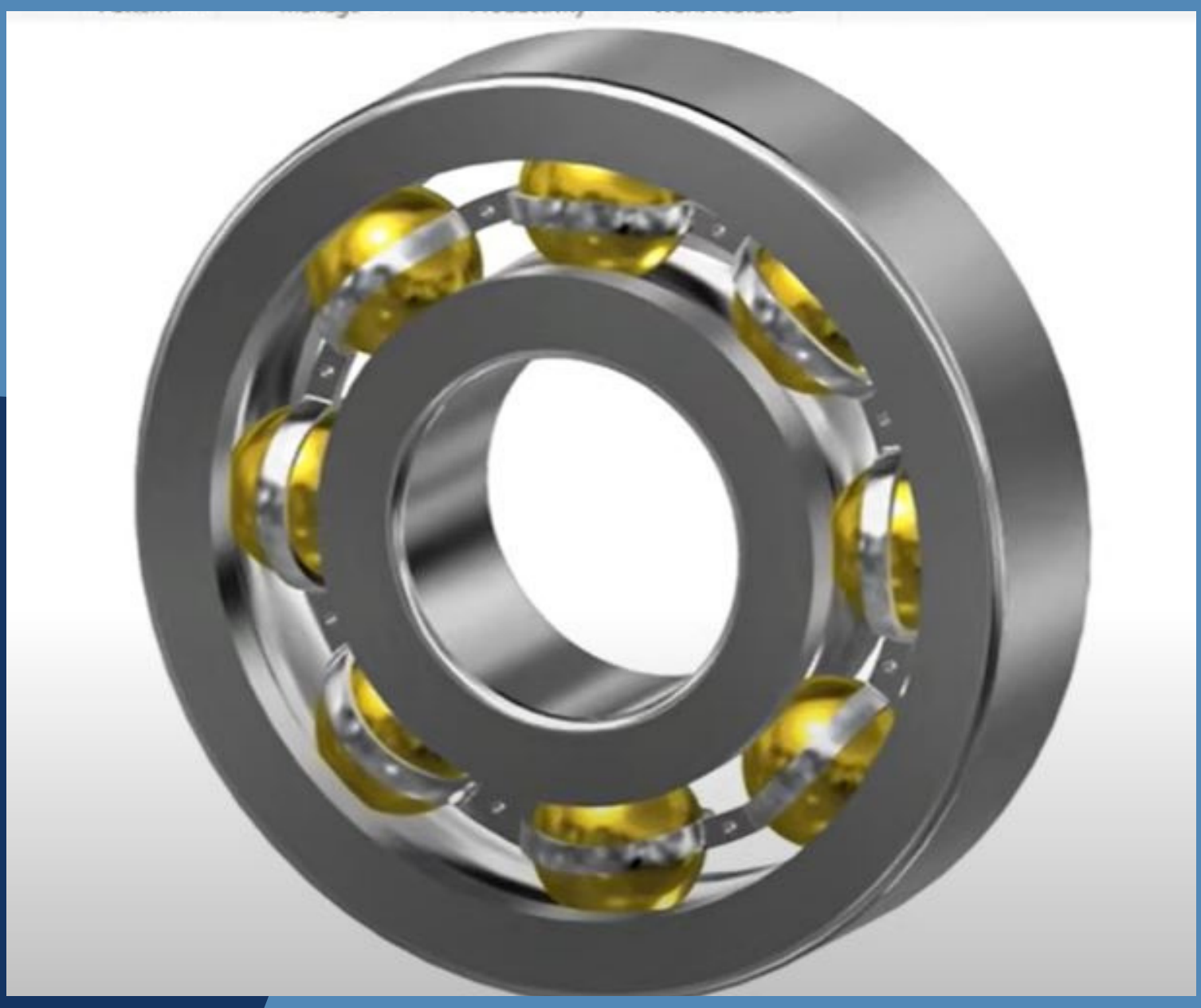
08

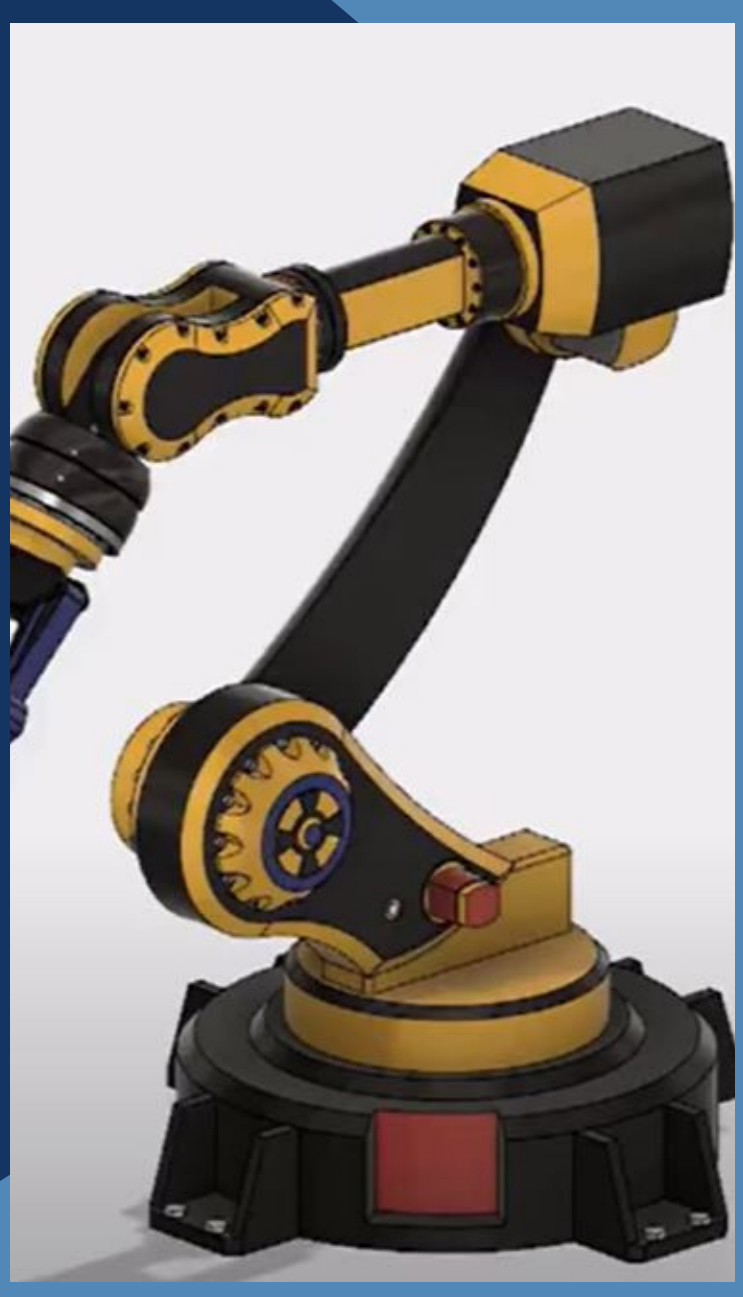
Automatic Irrigation System

09

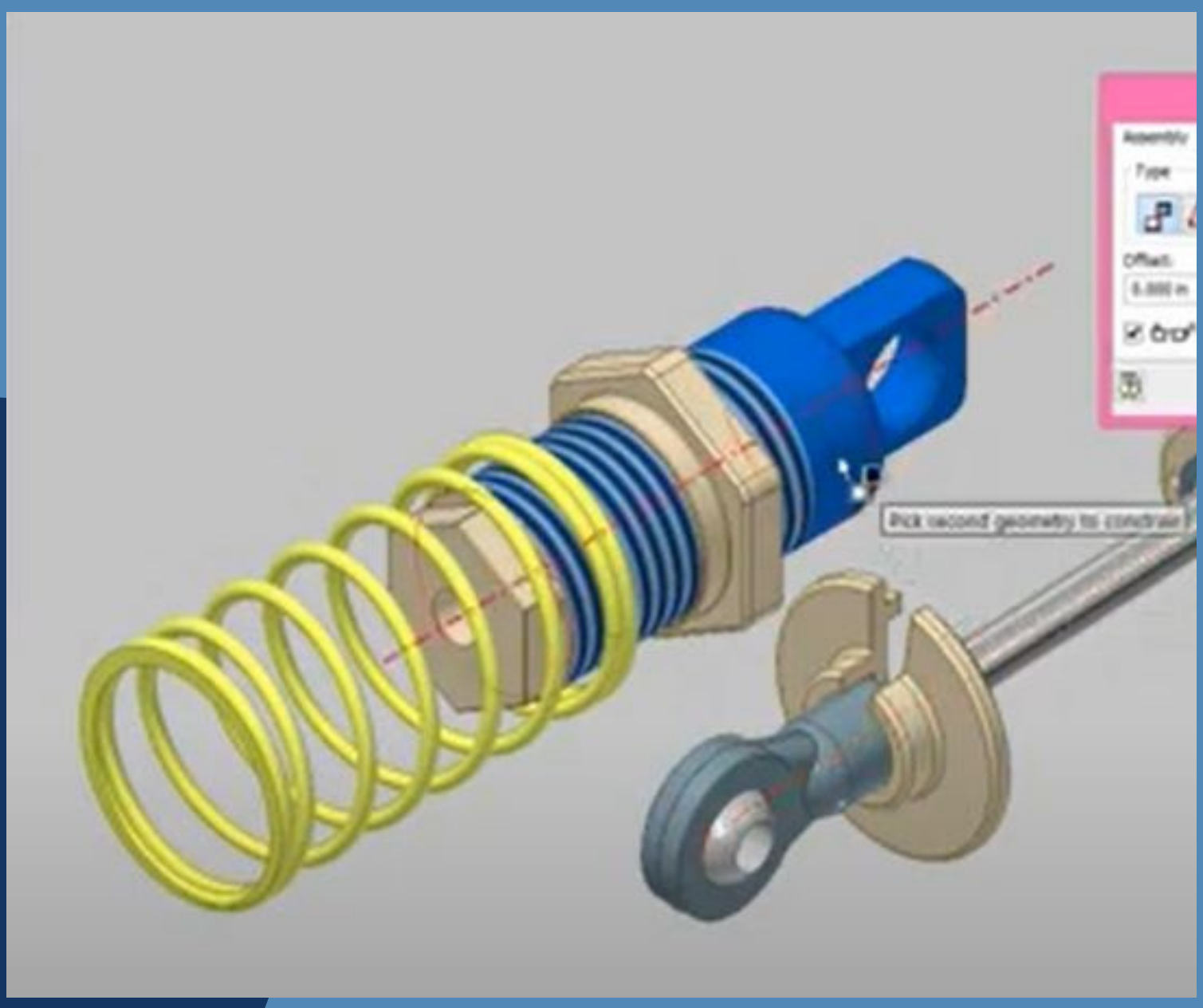


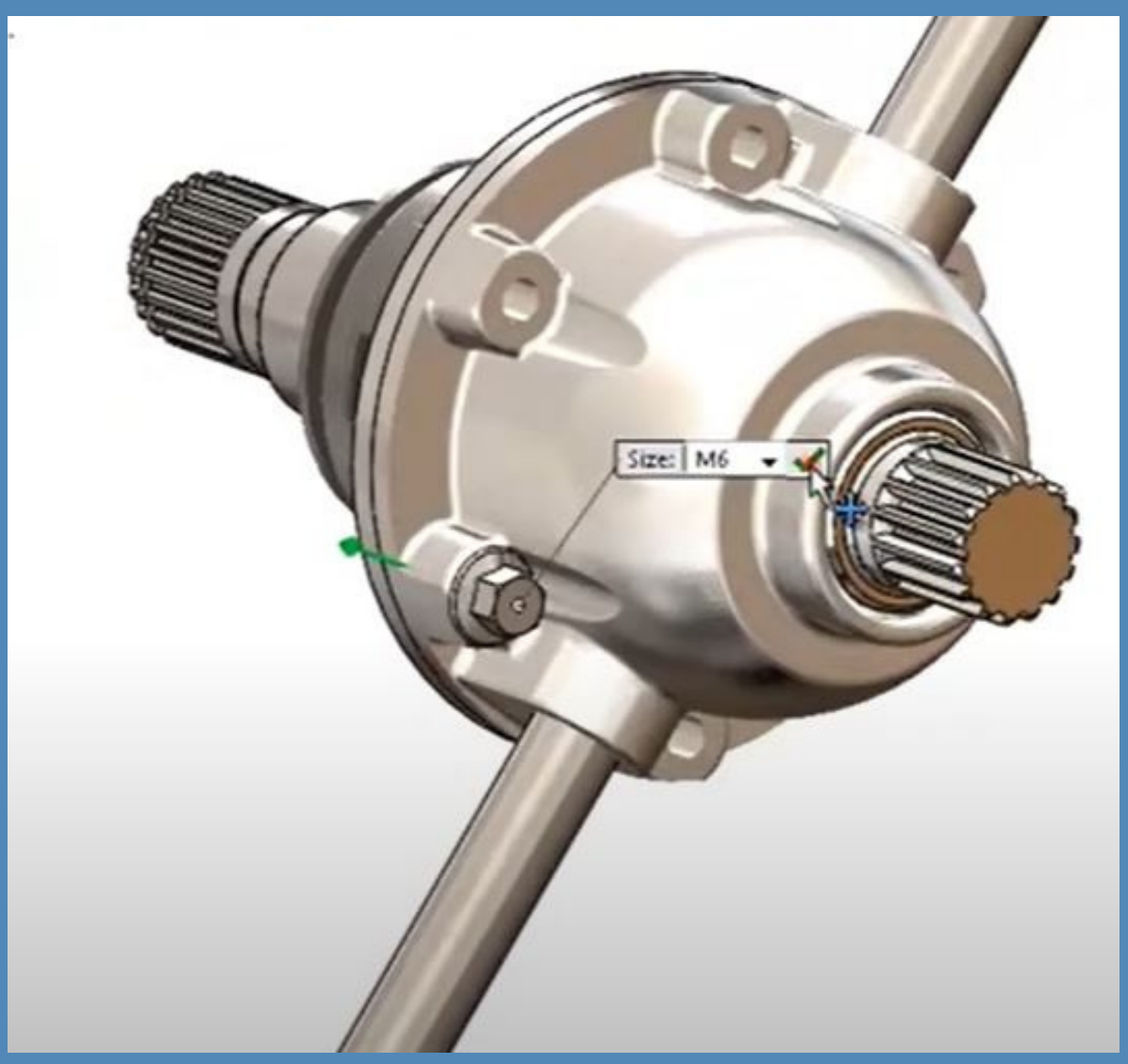
Remote Controlled Door Locking System

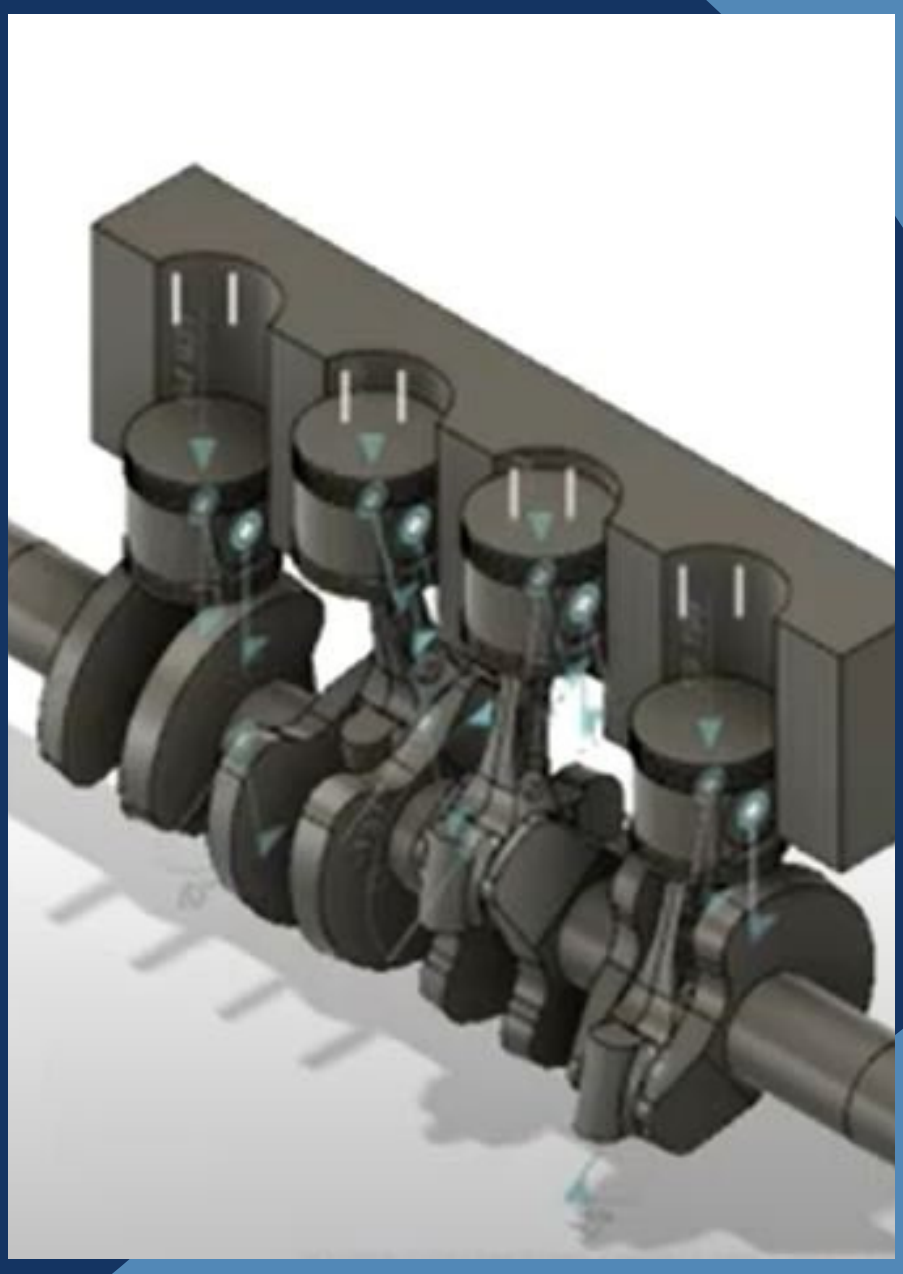




Modelling of different Assemblies







Modelling of different Assemblies