2020 ENGLISH

+49 (0)177 86920 39
eng.fredriksson@gmail.com

PORTFOLIO

CAD Design & Rapid Prototyping

M. ENG. JOSÉ FREDRIKSSON

Mechanical Eng. ⚙ Maschinenbau ⚙ Ing. Mecánico

Dear reader,

in the following pages you will find an extract of the work made as a student at the University of Applied Sciences Wildau (Germany) and of those projects made in collaboration and cooperation with various facilities, among them the *German Aerospace Centre [DLR] – Institute for Solar Research*, the *Deutsche Bahn Systemtechnik*, *Dedan Kimathi University of Applied Sciences (Kenya)* and *Fraunhofer Institute*.

Sehr geehrter Leser,

auf den nächsten Seiten stelle ich in einem Auszug verschiedene Projekte vor, die im Zeitraum des Studiums an der Technischen Hochschule Wildau realisiert worden sind. Auch Projekte in Zusammenarbeit und Kooperation mit verschiedenen Einrichtungen sind beinhaltet, darunter das *Deutsche Zentrum für Luft und Raumfahrt [DLR] – Institut für Solarforschung*, die *Deutsche Bahn Systemtechnik*, die *Dedan Kimathi University of Applied Sciences* (Kenya) und das Fraunhofer-Institut.

Estimado lector,

en las próximas páginas se presenta un extracto de los trabajos realizados durante el periodo como estudiante en la Universidad de Ciencias Aplicadas Wildau, Alemania. En el contenido se encuentran asimismo, proyectos en cooperación y labor con distintas Instituciones, entre ellas: la *Agencia Aeroespacial Alemana [DLR] – Insituto de Investigación Solar*, la *Deutsche Bahn - Systemtechnik*, la *Universidad de Ciencias Aplicadas Dedan Kimathi (Kenia)* y el *Instituto Fraunhofer.*

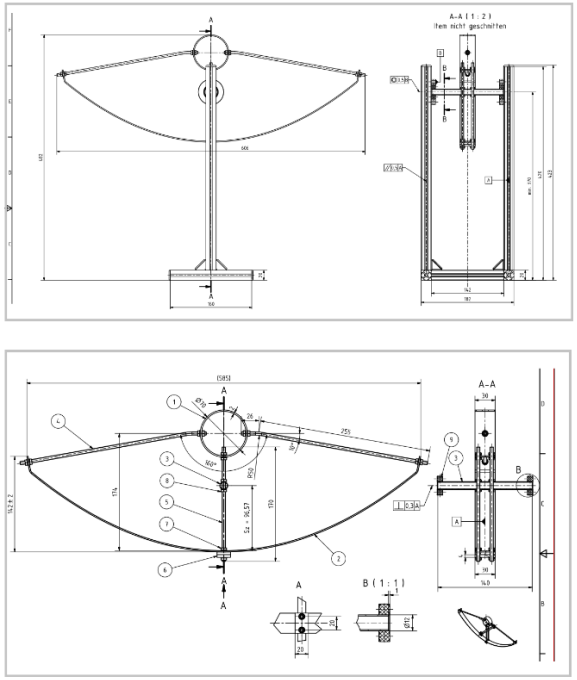
Kind regards • Mit freundlichen Grüßen • Saludos cordiales

M.Eng. Fredriksson, José

Content: Projects

1. Scaled model of an innovative fixed focus parabolic trough collector

Parabolic Trough Collector -Modell (1:5), Plataforma Solar de Almeria, Spain



Extract of two production drawings, 2019

Project: Comparison and evaluation of innovative parabolic trough collector concepts for large scale application in concentrated solar power plants

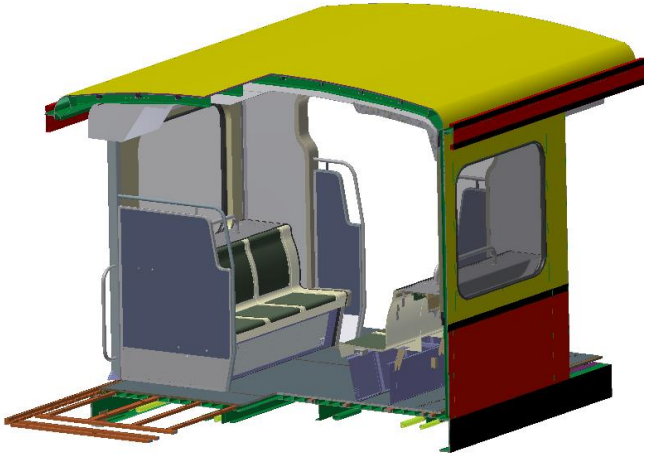
Company: German Aerospace Center [DLR] – Institute for Solar Research

Software: Autodesk Inventor

Comment:
- Model to visualize the function and advantages of the innovative collector concept
- Study showed a strong technical-economic potential for the new generation of collectors using molten salt
- Model cost-effectively produced in the DLR workshop with stock materials

2. Constructive modification in the interior of the train class 485 S-Bahn Berlin

Photo, 2016: Wagon before construction works



BR 485: 3D-Model of train section modifications

Photo, 2017: Prototype wagon

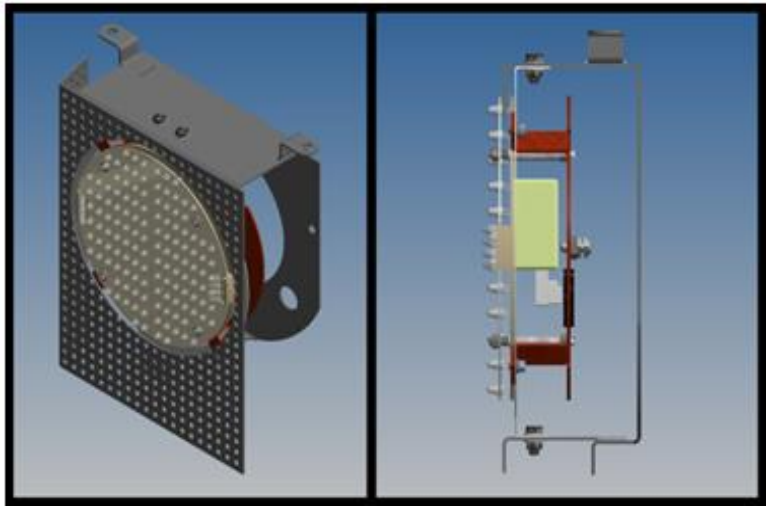
Project: Train series 485- Mass management and construction work for its continual operation

Company: DB Systemtechnik GmbH – Competence Center GT & ET *as project responsible*

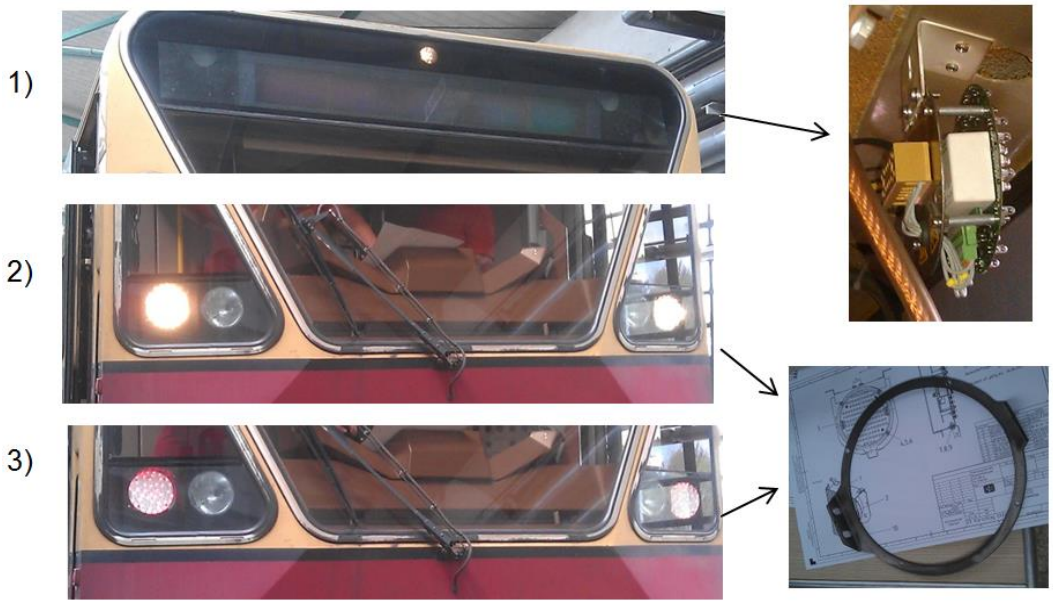
Software: Autodesk Inventor

Comment:
-Coordinator of the constructions work in the prototype wagon for the serial production of 80 wagons
-Developer of the constructive measures to compensate the weight overburden in the frontal wheel axis
-The technical documentation was made according to the FSF –Guideline
-Creation of work instructions and mass distribution reports

3. Retooling of the frontal Lights with LEDs in the train class 480 S-Bahn Berlin



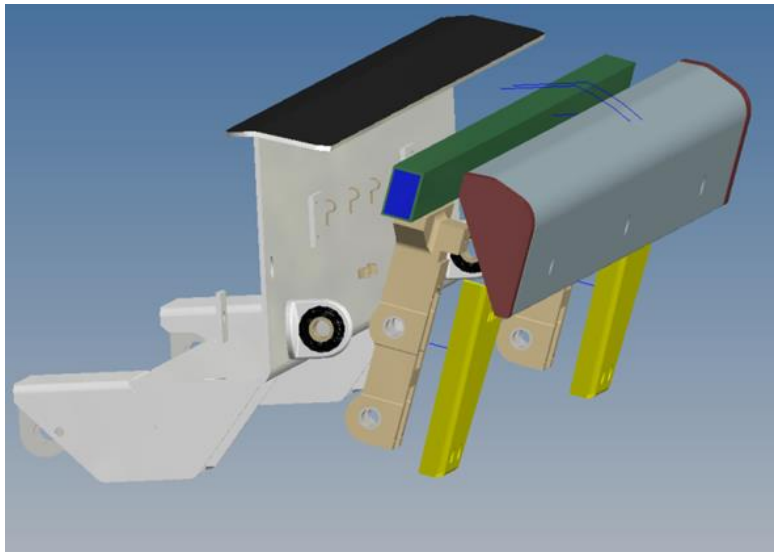
Model of the holder with the LED-Lights



Photo, 2015: LEDs seen from outside the windshield

Project	Train series 480 - Retooling the frontal Lights for its continual operation
Company:	DB Systemtechnik GmbH – Competence Center GT & ET *as an intern*
Software:	Autodesk Inventor
Comment:	Construction of the current holder for the adaptation of the new reflectors

4. New production of the folding ramp in the train 480 S-Bahn Berlin



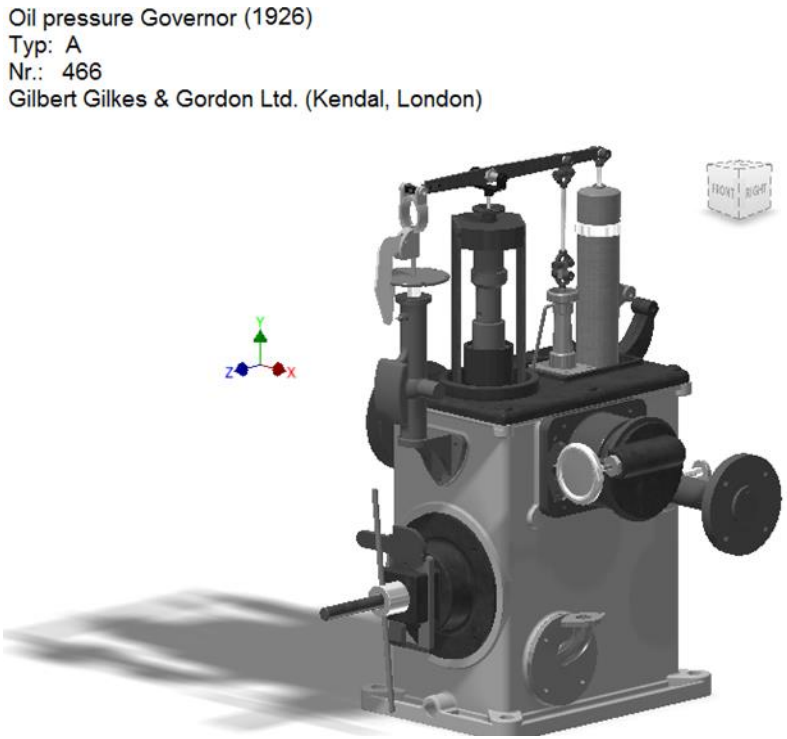
Presentation view of the folding ramp

Photo, 2015: Location in the train

Project	"BR 480- Folding ramp" for its continual operation
Company:	DB Systemtechnik GmbH – Competence Center GT & ET *as an intern*
Software:	Autodesk Inventor
Comment:	- Contribution to the modeling and the technical drawings of the single parts - Renovation of the hinge - Welding production

5. Governor of a Francis turbine in a coffee plantation in Kenya

Photo, 2016: Side view of the governor

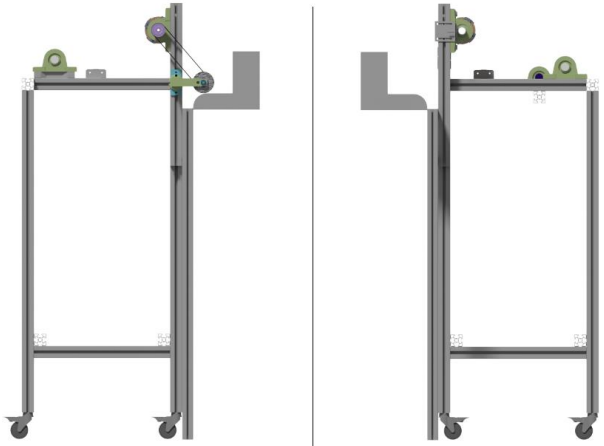


CAD Drawing of the governor

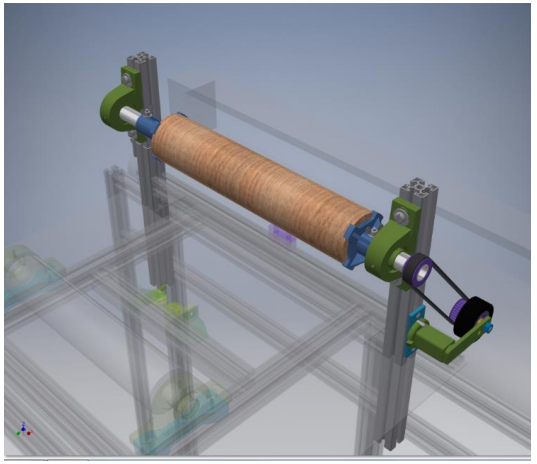
Summer project	Examination of the governor and maintenance for its revival
University:	Dedan Kimathi University of Technology, Kenya
Software:	Autodesk Inventor
Comment:	- Dismantling, measurement, refurbishment and CAD modeling of the single parts - Production of the missing parts that where recognized during the examination

6. Microwave hardening of fiber reinforced plastics machine at the Fraunhofer Institute

Photo, 2016:
Microwave hardening machine



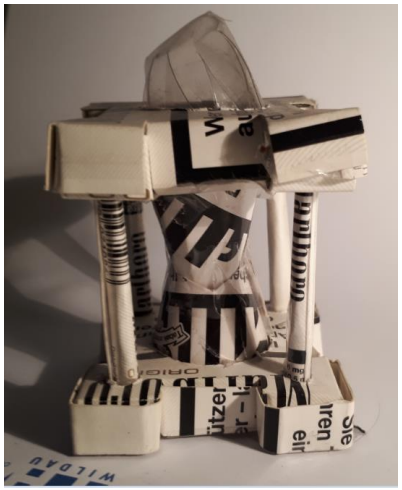
Input side and output side of the material



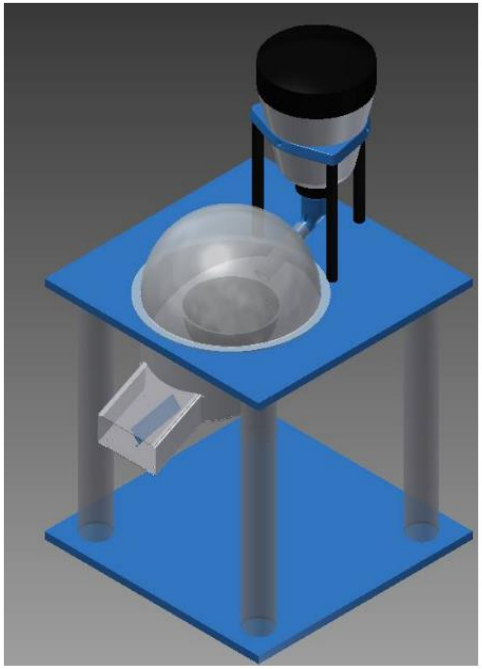
Output device

Project	II. Semester – Conceptual design of an adaptable device for the main hardening system
Cooperation:	Between the University of Applied Sciences Wildau and the Fraunhofer-Institute
Assignment:	Project management
Software:	Autodesk Inventor
Comment:	- Development of the structure with consideration of the beam shielding - Rapid Protyping of parts with 3D printing

7. Automatic popcorn machine



Photo, 2014:
Dummy made out of packs of cigarettes

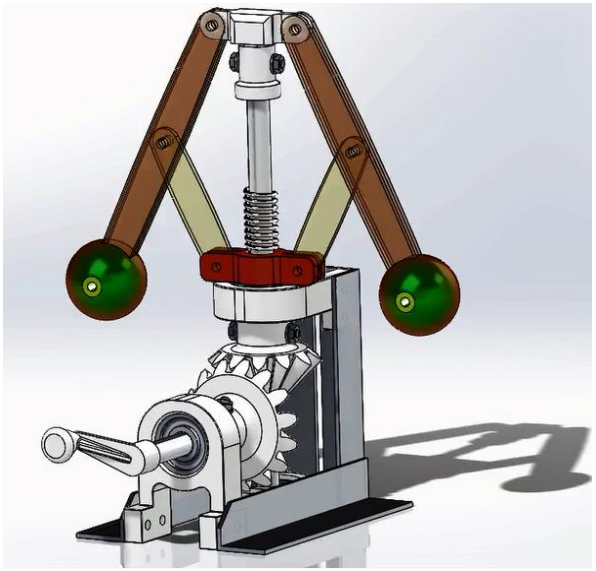


CAD–Model

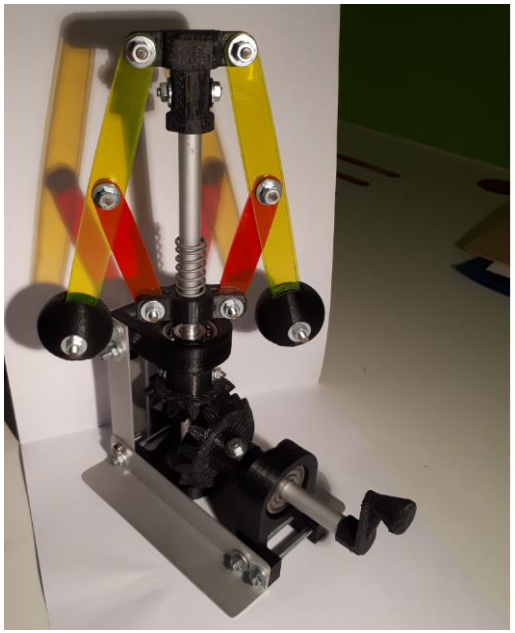
Photo, 2014: Popcorn machine

Project	Cornylicious -III. Semester – Bachelor – *voluntary project*
University:	TH Wildau
Assignment:	Automation technics / Sensors and actuators
Software:	Autodesk Inventor
Comment:	SPS programming, optical sensors, pneumatic circuit, production of the machine and single parts with 3D-printing
Link:	https://www.youtube.com/watch?v=Hdcuot9sc-0

8. Rapid Prototyping – Flyweight mechanism



Motion simulation in SolidWorks

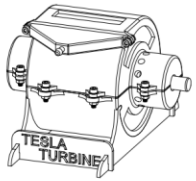


Photo, 2017: Prototype

Project	III. Semester – Bachelor
University:	TH Wildau
Assignment:	Rapid Prototyping
Software:	SolidWorks
Comment:	-Motion analysis and Simulation -Documentation of single parts and of the assembly

9. Rapid Prototyping – Tesla Turbine

Pos.	Stück	Benennung	Material	Halbzeug	Bemerkung
1	1	Welle	EN-AW 5019	Rd DIN 1799 - 30	
2	3	Gewindestange	S235JR		
3	10	Distanzscheibe	Acryl		
4	10	Scheibe	Acryl		
5	1	Mitnehmer	ABS	3D-Druck	
6	1	Distanzring kurz	ABS	3D-Druck	
7	1	Distanzring lang	ABS	3D-Druck	
8a	1	Gehäuse oben	ABS	3D-Druck	
8b	1	Gehäuse unten	ABS	3D-Druck	
9	4	Fenster Seite	Acryl		
10	1	Fenster Oben	Acryl		
11	1	Druckluft Adapter	ABS	3D-Druck	
12	2	Ständer	Acryl		
13	2	Schild	Acryl		
14	1	Gehäusedichtung	NBR		
15	1	Sicherungsring		DIN 471 - 10x1	
16	2	Rillenkugellager	100Cr6	DIN 625 - 6200	
17	10	Innensechskantschraube		ISO 4762 - M3x12	
18	26	Scheibe		DIN 125 - A3,2	
19	16	Sechskantmutter		ISO 4032 - M3	

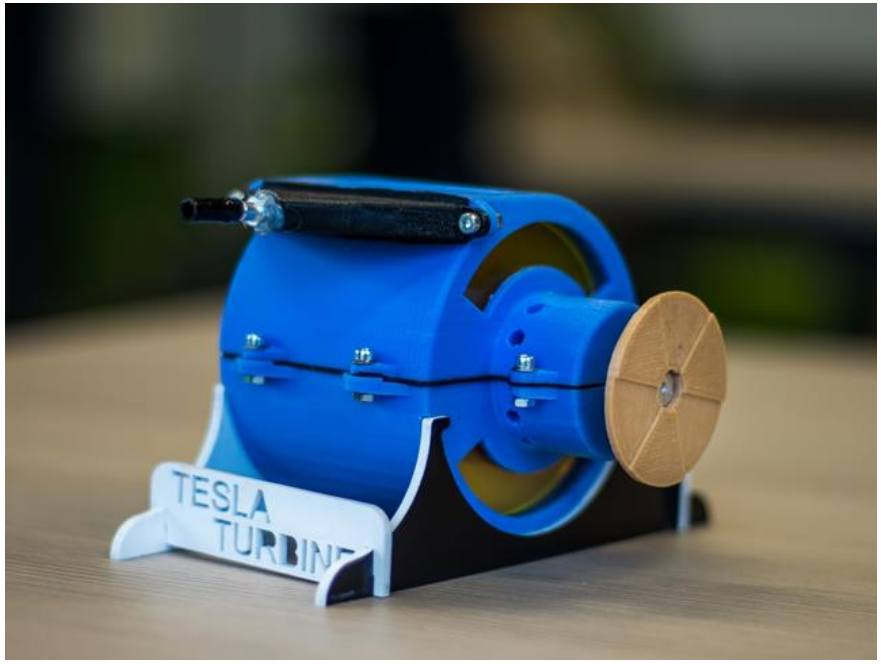


Stückliste Tesla-Turbine

Tesla_Stückliste

A4

Abstract of the documentation



Photo, 2015: Assembly of the Turbine

Project III. Semester - Bachelor

University: TH Wildau/ High performance Materials and coatings

Software: Solid Works

Comment: -Production of the prototype: laser cutting, 3D-Printing, turning of the shaft
-Data collection of the dimensional stability of the material used while printing

10. Hall crane – Calculations and model construction

Final construction – right view

Final construction – left view

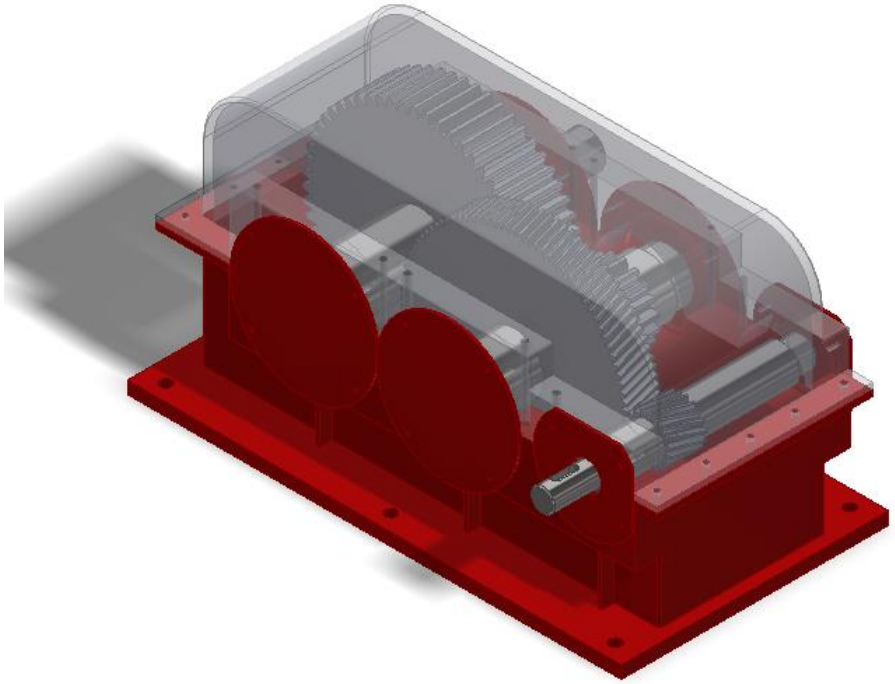
Project IV. Semester - Bachelor

University: TH Wildau / special construction elements

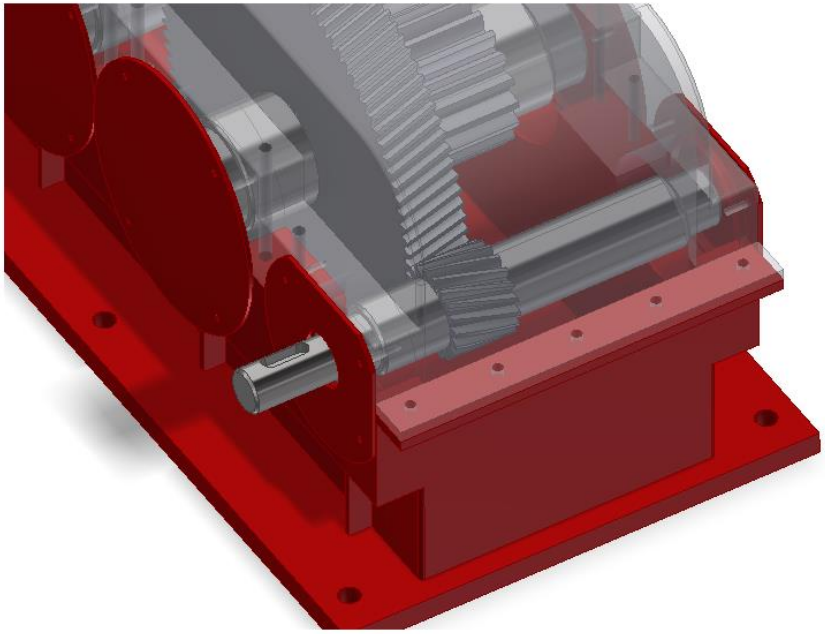
Software: Autodesk Inventor

Comment: -Top-Down modeling of the crane
-Calculation of: linear motors, load of the profiles and the pulleys, collision buffer s, dynamic characteristics

11. Two stages spur gear



View 1



View 2

Project III. Semester - Bachelor

Assignment: Machinery elements/Construction II & Product development/CAD

Software: Autodesk Inventor & MDesign

Comment: -Dimensioning the shafts and gears with one straight transmission and one with a given angle contemplating the required performance and lifetime
-Choice of bearings and modeling of housing

+49 (0) 177 86920 39
eng.fredriksson@gmail.com