Portfolio

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Bachelor Thesis

Hochschule Zittau/Görlitz
UNIVERSITY OF APPLIED SCIENCES

Baker Hughes

Location: Germany

Challenge: Design and develop the wireless communication for the functional 3D demonstration model of the downhole tool “steering unit”

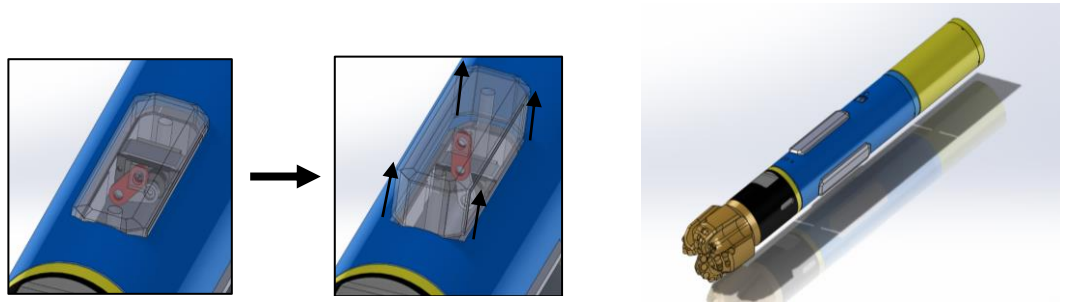
Results: The construction of a functional prototype and connect the tool via Wireless to a device and show the data from the tool.

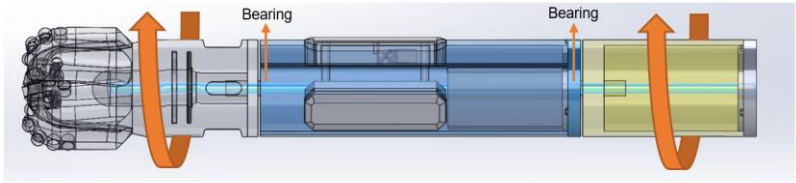
Technical Overview

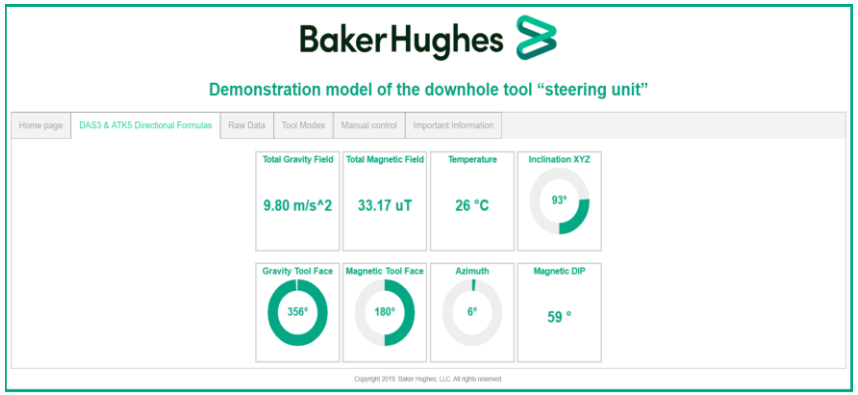
Mechanics: The prototype includes a non-rotational and a rotational part and a three ribs mechanism to achieve a directional drilling.

Electronics: The prototype use a NODE MCU 12 microcontroller, a MPU9250 (accelerometer and magnetometer) to know the orientation of the tool and three servomotors to control the ribs.

Software: The GUI was programmed in HTML using WebSockets to get the data from the tooland the microcontroller was programmed in C.







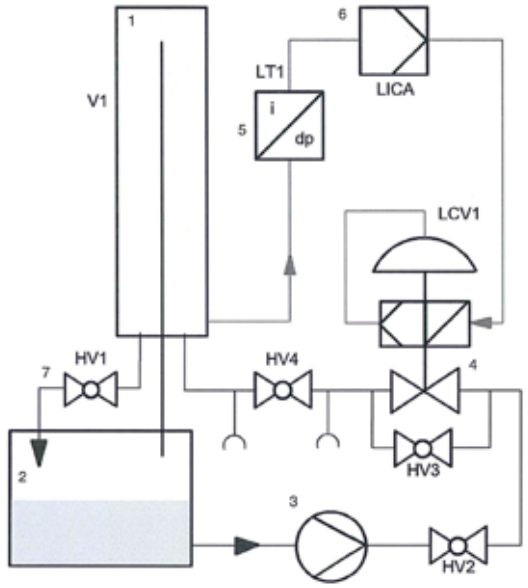
Mechatronic Project Work

Hochschule Zittau/Görlitz
UNIVERSITY OF APPLIED SCIENCES

Location: Germany

Challenge: Design and Testing of a controller for the “GUNT water level control” and test it with simulation.

Results: A mathematical model of the plant and a proper controller. The functioning of the controller was proved by simulations.



Process Schematic	
1	Level-container
2	Water Tank
3	Submersible pump
4	Control Valve
5	Pressure Transmitter (Sensor)
6	Industrial Controller
7	Drainage tap (HV1)

Technical Overview

Hochschule Zittau/Görlitz
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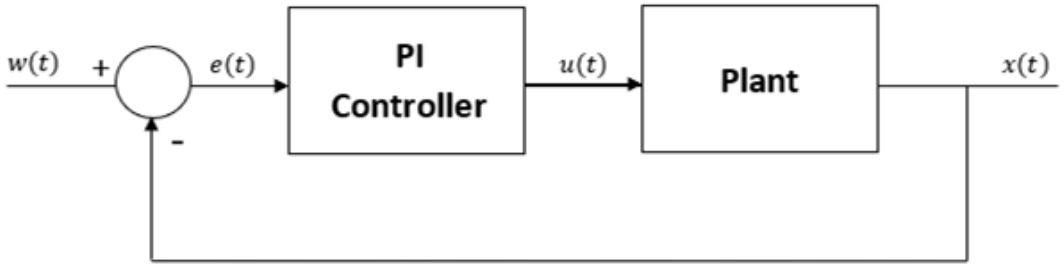
Hardware:

GUNT level control test rig.

National Instruments data acquisition (DAQ) device.



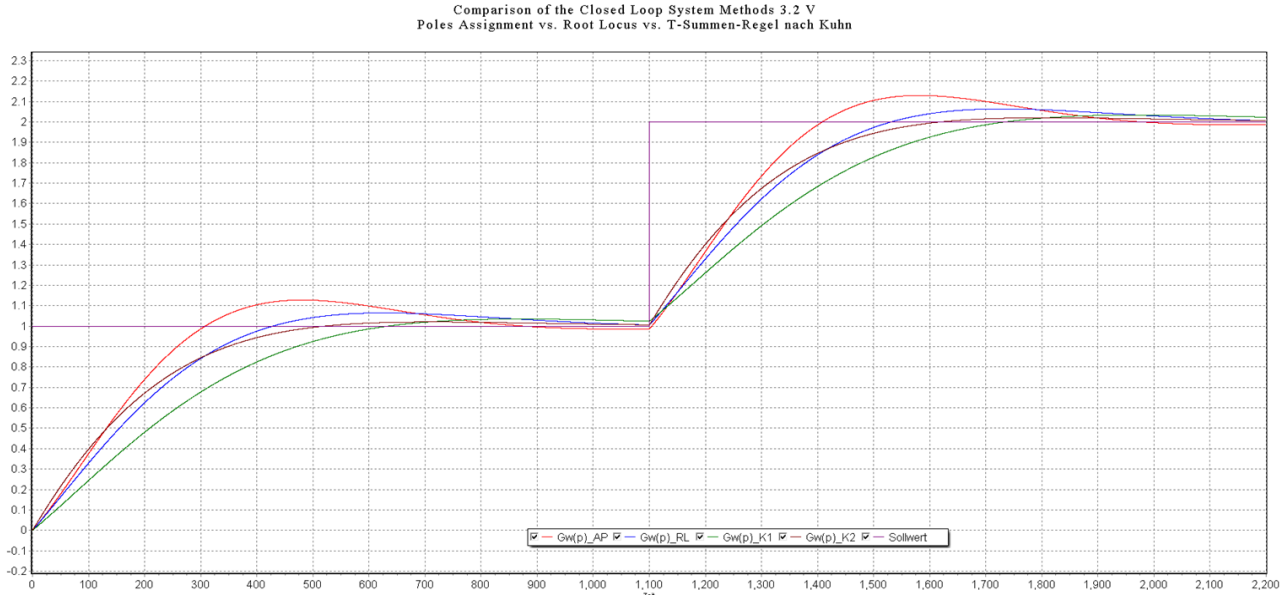
Software:

National Instruments LabVIEW 2016

DynStar

Microsoft Excel

MATLAB/SimuLink



Mechatronic Project for APAC

Location: Mexico

Challenge: Design and develop a Mechatronic Project to help children with cerebral palsy, in order to help them to improve their quality of life.

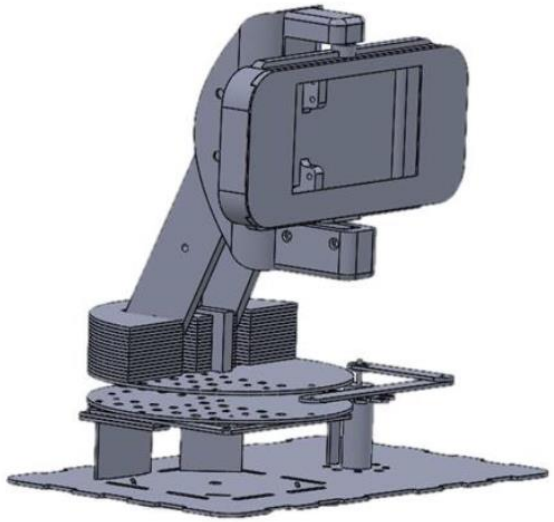
Results: The construction of a functional prototype, the main goal is to stimulate and help the education of this type of children.

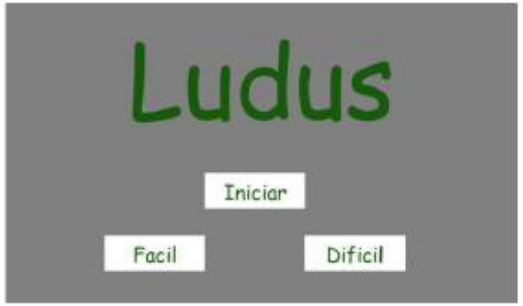
Technical Overview

Mechanics: The prototype has an arm that helps reach any kind of position, this is helpful for the children because in most of the cases they can't move their heads. The prototype has a wireless control.

Electronics: The prototype use a Raspberry-pi, 2 ATMega328, Bluetooth modules for communication, display of 7 inch and 1 IMU (Inertial Measurement Unit)

Software: The educational platform was develop in Python and the program runs in the raspberry pi.





TM Racing: telemetry system

Tecnológico de Monterrey

Location: Mexico

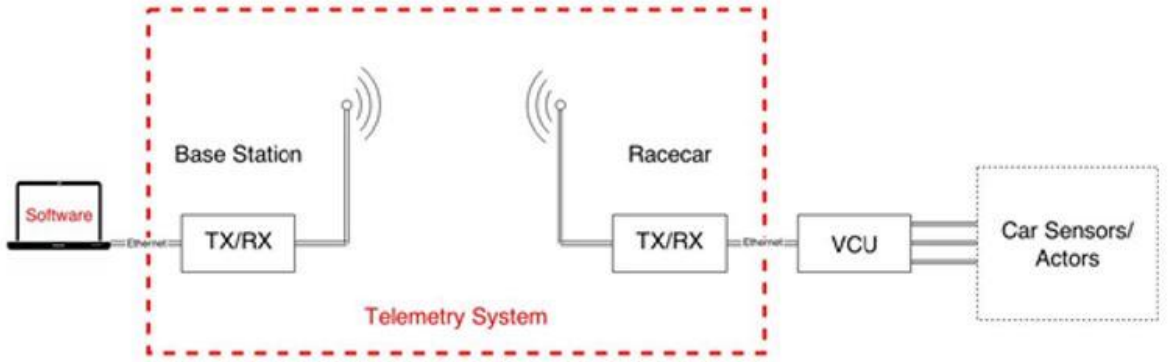
Challenge: Design and develop a telemetry system for a formula student car that will compete in Silverstone 2019.

Results: A functional system that communicate the sensors of the car with an external computer from 500m of distance, the connections is stablish via ZigBee communication.

Technical Overview

Electronics: The telemetry system was develop using these components ATMega 328, CAN_BUS shield, Wireless SD shield, Xbee PRO S2B RPSMA, Antena RPSMA 2.2 dB and Xbee xplorer.

Software: The reception of the data is in the computer, also this data is processing with the software LabView and MatLab

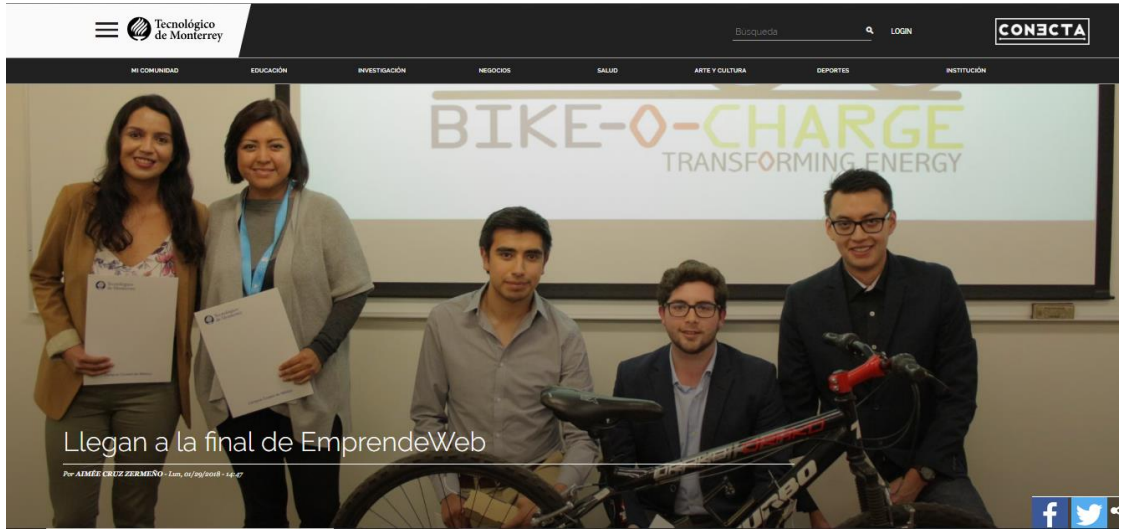


Entrepreneurship-Sustainable project

Location: Mexico

Challenge: Design an entrepreneurship project for a class, using the knowledge of your Engineering. The project was a way to convert the mechanical energy of the bike into electric energy to charge a phone. This project can be implemented in all the touristic bikes.

Results: The second place in the entrepreneurship contest and a promise of financial help from the persons that were watching the final presentation.



LINK: https://tec.mx/es/noticias/ciudad-de-mexico/negocios/llegan-la-final-de-emprendeweb

Technical Overview

Tecnológico de Monterrey

Mechanics: The prototype has to be modify a lot to be a commercial product, but it's a functional prototype.

Electronics: With the help of a stepper motor we obtain an alternating current from the rotation of the bicycle then with a diode bridge and a capacitor we rectify the alternating current into direct current. A LM7805 is use to obtain 5v that is the average voltage in which a phone can be charge.

BIKE-O-CHARGE
TRANSFORMING ENERGY