Production Engineering Department

Construction of 3D Printing machine using Reverse Engineering

Supervisor by
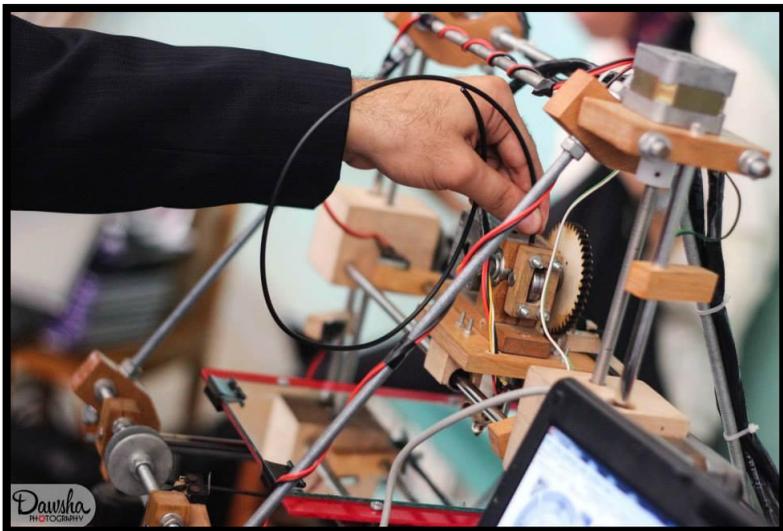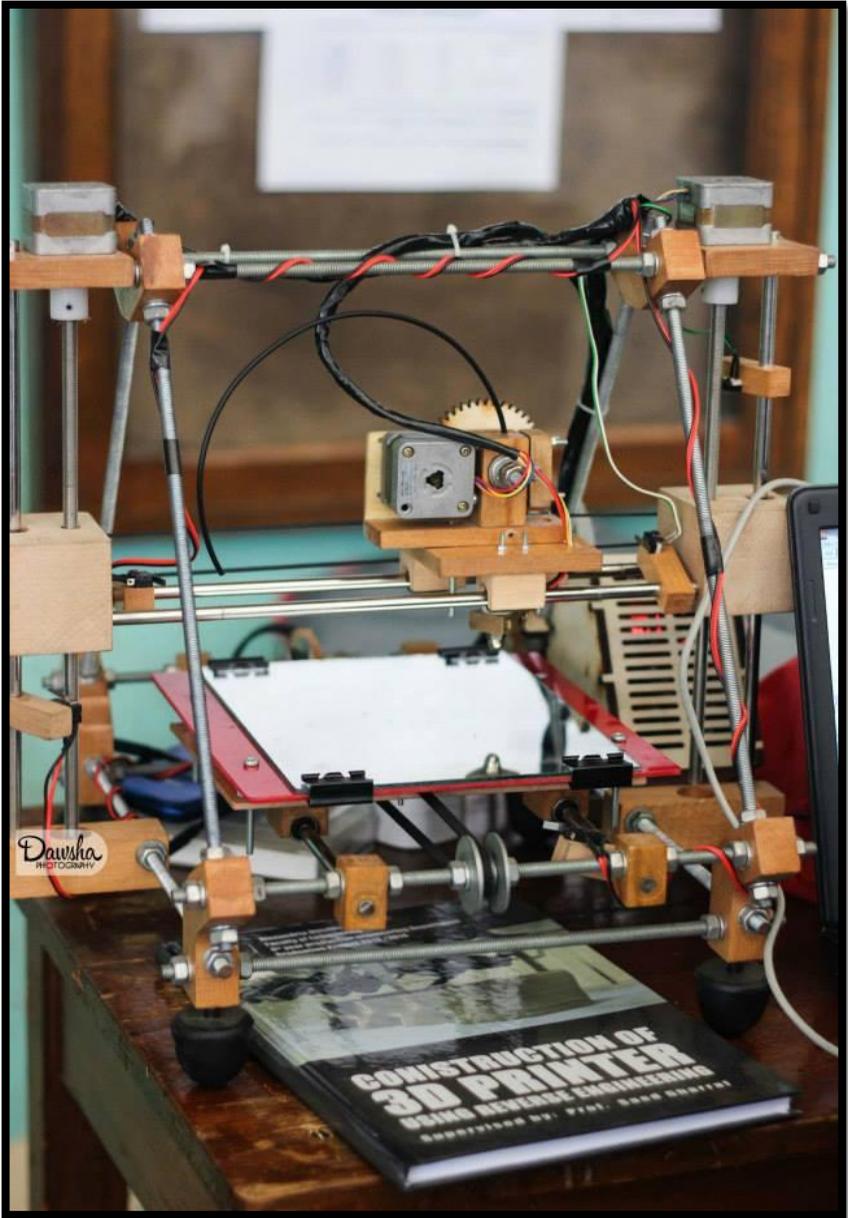Ingi Abdel Azz Srag   Ahmed Amin

Project abstract

After prescreening the different ideas available to apply Reverse Engineering, the team has decided to go for the 3D Printing technology that become the new revolution changing our lives, and we initiated to construct a 3D Printing machine based on Fused deposition modeling.

The first stage was manufacturing the main parts after finishing the full design and that was implemented in the college workshops, then starting to assembly the main mechanical with the electrical parts.

The final stage was producing prototypes using our 3D Printer as shown below the photos of the machine and the prototypes designed and produced.

Mechanism Design of Robot Arm "MDRA"

Supervisor by
Mohab Mohamed Hossam El-Din

Project abstract

Fencing is an excellent sport to improve lower body strength and speed, as well as hand-eye coordination, it also develops agility and flexibility and is probably most similar to many of the martial arts in terms of the collection of skills it requires. "In fact, studying fencing has many benefits, for both the body and the mind.

A typical fencer training consists of the practice of different attacking and defending techniques at several and different situations simulating about situation. This practice is achieved through having practical lectures with the trainer in order to acquire the proper and suitable techniques and strategies needed while competing, dueling with other fencers for the purpose of applying and practicing these taught techniques and strategies, and replicating these technical actions as many as possible seeking the best performance required to score during a duel.

However trainer performance is affected due to fatigue when conducting several lectures consecutively, and thus, the gain acquired by the fencers will decrease with the increase of their order of lecture. For high level fencers, the trainer who is relatively aged will not be able to match up with the fencers' speed, strength, and fitness. The engineering can solve this problem by design a mechanical mechanism has the ability to repeat the same motion more than one time with high speed, high accuracy and without fatigue.

The ultimate goal was to design and manufacture about arm which represents innovation in the training methods of the fencing sport and so we proudly introduce MDRA "Mechanism Design of Robot Arm".

MDRA is designed to mimic a human arm in every aspect. The structure of the robot is mechanical and can be called a kinematic chain. The chain is formed of links (its bones), actuators (its muscles), motors (its joints) which can allow for seven degrees of freedom and a battery working as a power supply.

Lean Manufacturing (value stream mapping)

Graduation Project

Ahmed Ali Abd El Gafour El Adoly   Ahmed Said

Project's Abstract

The project simulated the current state of unilever's lepton tea factory using value stream mapping to identify the factory's main five products 100TBs, 25TBs, 10TBS and 250 gram, 10 gram Dust tea.

From the value stream maps a detailed approach was defined in order to analysis and Quantify the main cause of the dominant waste – The rework waste-using root cause analysis techniques , a set of actions were developed in order to reduce the waste .

After implementing the developed actions on a chosen work center , its rework waste percentage from the production dropped by 70% , The factory's overall rework waste percentage could be reduced from 11.5% to 3.5%.The maintance breakdown that were related to the main cause at the chosen machine were eliminated entirely.

The current value stream maps and the rework waste analysis can be used to construct the future state map and complete the cycle of continuous improvement in order to reach a total lean environment and a wastless value stream.