Department:	**Mechanical Engineering**	
Project:	**Design and manufacturing of a Belt Conveyor**	
Supervisor:	**Prof. Dr. Ahmed Fouad EL Sanabary**	
Students:	Ahmed Mostafa Helmy Ahmed	Hesham Mahmoud Abd El Hmeed Ali
	Michael Atef Naguib Mahrous	Ahmed Mostafa Mohamed Abdou

ABSTRACT

This belt conveyor is used in industrial production lines. Also, it is required to apply the idea of detecting any of outcomes problems by using the suitable sensors, then design a control system to get red off this problem.

1-Basic Elements:

The chassis, the rollers, the driving and driven pulleys, and selection suitable motor with a reducer to give a desired velocity. Measuring and control system.

2- **Design and production steps :**

   (a) The preliminary design: A historical survey for the belt conveyors.(All the students)
   (b) The final construction design: done by using packages (Solid edges and Auto cads). (All the students)
   (c) The production of belt conveyor. (All the students)
   (d) Study and survey of the control system and suitable sensors. (Ahmed moustafa helmy)

3- Control system:

   (a) A chosen criteria of certain product is chosen (e.g. the weight tolerance of the product)
   (b) Survey of the suitable sensor to detect the tolerance weight.
   (c) Design a suitable measuring system to get the correct weight within the chosen weight tolerance.
   (d) Design a control mechanism to reject the product which is out of weight tolerance.

Department:	**Mecharonics Engineering**	
Project:	**Intelligent Automated supply and retrieval system (IASRS)**	
Supervisor:	Dr. Ahmed Helmy Onsy	
Students:	Ismaiel Raafat Bekeet	Mohamed Nabel Altl
	Hassan Tawfek Moharam	Ahmed Mohamed Reda
	Mohamed Sayed Metwaly	

ABSTRACT

Automated storage and retrieval system (AS/RS) is one of the important improvements in now a day's inventory systems, which allows items handling from/to their storage locations and an origin point. The AS/RS's are currently gaining in popularity due to their effectiveness in reducing handling costs; however, this requires an effective design and a reliable control system.

This proposed project is aimed to build on Phase 1 of an AS/RS that has been recently developed for pharmacies or small inventory locations. The development process include the following:
1- Improve the design and production of the mechanical parts.
2- Rebuilding the control system sensory- actuation hardware part, including install new sensors to allow the autonomous operation of the system and increase the system safety.
3- Development of user interactive control software linked to database program.
4- Testing and validation the system operation.

Department:	Mechatronic Department	
Project:	**Design and Manufacturing of Energy Recovery Tile**	
Supervisor:	**Dr. Mohamed Metwally** **Dr. Ahmed Abou El-Azm**	
Students:	Sherif Zahran	Mohamed Fares
	Ziad Ezzat	Moamen Hussein
	Ahmed El-Bagoury	

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ABSTRACT

Many recent researches have been conducted in energy harvesting materials and ultra-low-power devices. These devices will operate using very low ambient energy such as indoor light energy, solar energy and vibration energy. The energy availability in indoor environments has been raised in attention to develop simple rate collection algorithms using piezoelectric devices. These devices capture energy from the users vibration energy produced during walking or running and it can be implemented to produce ultra-low-power devices.

The objective of the project is to create design and implement a device that harvests ambient energy sources into usable low electrical energy. In To achieve ingthis, different energy recovery mechanisms have been revisited to select the suitable mechanism. The mechanism of energy harvesting has been designed to collect energy including the circuit design using piezoelectric material and at different mode of operation. The mechanical components have been designed and manufactured providing assembly, integration and system testing.

Keywords: Energy Harvesting, Piezoelectric material, vibration energy, energy tile.

Department:	**Electronics and Communications Engineering**	
Project:	**Autonomous Control System For a Unmanned Aerial Vehicle (UAV)**	
Supervisor:	**Dr. Amgad M. Bayoumy**	
Students:	Yousef Mahmoud Yousef	Ramy Adel Georges
	Hossam Abdullah Mahmoud	William Moussa Awad

ABSTRACT

The evolution of autonomous systems has grown widely over the past two decades. One of the latest applications of automation is in Unmanned Aerial Vehicles (UAVs). Airplanes are being transformed from remotely controlled to autonomous control by a series of interacting systems. One of these systems is the navigation and control system, which use integrated sensors such as GPS, digital compass, IMU, thermopiles, etc.

Design of such a system for a small radio controlled model airplane consists of gathering available motion parameters from available sensors using a microcontroller. A navigation algorithm is used to extract useful information from sensors data. Then decision will be taken based on the information extracted.

The objective of this project is to understand the design and implementation a low-cost unmanned aerial vehicle to study the feasibility & robustness of this system. The subsystems components were chosen carefully according to research and budget requirements.

A group of 5 students worked on implementing such a system.

Yousef Mahmoud has studied and worked on the communication of the system via the telemetry link and radio control.
Ramy Adel has studied and worked on the microcontroller code and the control of the autonomous system.
Hossam Abdullah has studied the anatomy of the airplane, its assembly and the design of the system.
William Moussa has studied and worked on the user interface and simulation of the system.

Department:	**Mechatronics Engineering**	
Project:	Vision-based System for a Robotic Car	
Supervisor:	**Dr. Amgad M. Bayoumy**	
Students:	El-Shabrawy, Khaled Ahmed	Helal, Mohamed Fouad
	Daniel, Mina Esmat	Gendeya, Mohamed Ahmed
	William, Ihab Khairat	

ABSTRACT

Vision based systems are present now in most luxury cars. It provides essential security and assistance for drivers. Design of such a system for a small car consists of implementing a vision based control system. One or more small cameras are connected to a portable PC. In this project, vision-based obstacle identification and avoidance technique is presented for a safe navigation of an unmanned ground vehicle (UGV) in an unstructured and unknown indoor environment.

The vision-based obstacle detection and avoidance is implemented by detecting a laser point position from a laser pointers installed in the vehicle by the mean of an on-board camera. Afterwards, we compute the position of any obstacle relative to the vehicle thanks to geometric triangulation, and then finally the order is given to the vehicle to avoid the obstacle through a steering control circuit.

The tasks of every in this project are as follows:

The student **Khaled Ahmed El-Shabrawy** is working as the team-leader of this project, as well as working in embedded vision system design. He designed the control system, through studying the interface between the control program (**MATLAB**) and the microcontroller (**Arduino board**), and designed the control circuit and developed the control code for applying the steering angel and acquiring its feedback.

The student **Mohamed Gendia** studied the electrical and mechanical systems of the vehicle. Moreover, analyzing the procedure of the vehicle motion

The student **Mina Esmat** studied the system modeling. It includes relating inputs with outputs to derive mathematical equations which will provide basis the vehicle movement**.**

The student **Mohamed Fouad** designed the vision system, through studying image processing, camera selection and calibration. Then he developed **MATLAB** code for obstacle avoidance using laser detection technique.

The student **Ihab Khairat** studied the vehicle specifications and design using **Solid edge**; it includes a complete and detailed outline of the vehicle.

Department:	Mechanical Engineering – Mechatronics	
Project:	Self-reconfiguring robots	
Supervisor:	Dr. Mohamed Abd El Aziz	
Students:	Ahmed Saeed Ibrahim	7103813
	Fady Galal Anton	7103733
	Ramy Adel Ahmed	7104525

ABSTRACT

Self-reconfiguring robot is a robot that can reconfigure its shape to adapt to the nature surrounding it, self-reconfiguring robot faces a challenge in the mechanical design which is the shape reconfiguring while maintaining the physical stability of the system design. The objective of this project is to design a Self-reconfiguring robot that can move as a vehicle and reconfigures its shape when it detects an obstacle (ex: as a Hexapod) in order to pass this obstacle easily. The development process will include designing the mechanical structure of the robot, checking the design considerations using different simulation programs and apply different control methods on the robot. The ability of the self-reconfiguring robots to do a real job in our ordinary life is being questioned nowadays as they face a major problem in the power source and the power consumption that's why most of the research on the self-reconfiguring robots is made on a small scale. In the future more research must be done on the major problem of the self-reconfiguring robots which is the power source and power consumption.

Department:	Mechanical Engineering (Mechatronics)	
Project:	**Cantilever Testing Machine Based on a hydraulic system**	
Supervisor:	**Dr. Mohammed EL-Sayed**	
Students:	Sherif Fares Abd ELBaki	Mohammed Ibrahim ALMaghraby
	Mahmoud Mohammed Hamdan	Mohammed Karam Ahmed
	Mustafa Amin ALDabee	

ABSTRACT

During this project we studied the behavior of a rigid construction supported on one end and extended horizontally, cantilever, while applying a maximum force of 150 KN perpendicular to its free end. The purpose of this project is to obtain a stress-strain curve and display it to a PC screen. This cantilever is made of concrete which is reinforced with bars of steel.

The force was applied through a hydraulic system with a pump of 200 bars maximum output pressure, powered by three-phase electric power (380 Volt), and a double acting cylinder to provide the force in which starts to bend the cantilever. Since the pressure is the force divided by the area where the force is applied, and by adding a pressure sensor ,with a maximum operating pressure of 250 bars, to the cylinder; the acting force was determined.

The deflection in which accords to the cantilever was measured by a Linear Variable Resistance having a 300 mm length and a high resolution of 0.05 mm with an output voltage range from 0 to 5 Volt via voltage divider inner circuit. All the components are attached together and mounted in a steel frame with an adjustable height to have the best circumstances for testing the cantilever.

The hydraulic system and all the results of the sensors attached will be controlled and displayed through a Data Acquisition Card that transfers all the data to and from the PC which has a suitable drivers to handle the control and results (LabView) installed in it. All the data from the sensors are synchronized to achieve the best readings and calculations of which determines the actual stress-strain curve of the cantilever.

Department:	Mechatronic Engineering	
Project:	**Concrete block hydraulic testing machine**	
Supervisor:	**Dr.Mohamed A. K. Elsayed**	
Students:	Karim Gamal	Ashraf Senger
	Aly Adel	Mohamed Zakaria
	Omar Sayed	

ABSTRACT

In this project, a Hydraulic testing machine is designed . The machine is used in order to test either tension or compression on a specified known material specimen. The machine will perform the task by applying a force on the specimen using a hydraulic piston which is motorized. The application of this project is used widely in any construction project, which is considered as an essential part of civil engineering projects .The addition of control unit in the project reflects the deep understanding of the students of Mechatronics program and its vast applications in the real life.

Department:	**Mechanical Engineering – Mechatronics**	
Project:	**Design and manufacturing of a rapid prototyping Machine**	
Supervisor:	**Dr. Mostafa Rostom A. Atia**	
Students:	Karim Mohamed Shaker	8104318
	Mohamed Ibrahim Galal	9109868
	Mohamed shaban	7103819
	Adham Ahmed Saleh	7103764
	Amin abd ElKarim Mohamed	7103431

ABSTRACT

Automotive electric wiring system is a sophisticated one. It has a wide range of various electric cables and hoses. The hoses have different materials, cross section dimensions and lengths. For large production, as in LEONY CO., the hoses should be cut in accurate length and quantity in short time. In the present project, a cut to length machine will be developed. The machine will be based on industrial servo drive.

During the project, the students have designed the mechanical part of the machine. This includes the preparation of engineering drawing, workshop drawings and calculation sheets. The mechanical parts have been manufactured and assembled according to the design. The control strategy and control system have been developed by the students. The control system consists from hardware, such as electronic circuits, and software, such as motion control and user interface. The system has been established and tested. The tests prove the system workability and accuracy.

The project contains all the mechatronics branches. It contains mechanical system, which is controlled using electronic circuits. The control strategy is contained in software. All the system parts have been developed and executed by the students.

Department:	Mechanical Engineering – Mechatronics	
Project:	**A CNC 3D node indexer**	
Supervisor:	**Dr. Mostafa Rostom A. Atia**	
Students:	Tarek Mostafa Mahmoud Mohamed	
	Omar Ismaail Hassanin	
	Khaled Bader El Dean	
	Amr Hassan Amr Zahran	

ABSTRACT

Trusses are very important style for building constructions. Nowadays, The node trusses give a great flexibility to construct very complicated shape buildings. This type of trusses is based on balls and links. The balls are drilled and taped in 3D angles. In many trusses, the balls have different sizes and they are taped in different angles. Traditionally, these balls are manufactured using 5-axes CNC machines. The present project, introduces a new machine, which produce these balls using only four axes and use conventional drilling machine. The machine will index the balls in spherical coordinate for drilling and taping. The indexing operation is fully controlled via a CNC system.

During the project, the students have designed the mechanical part of the CNC system. This includes the preparation of engineering drawing, workshop drawings and calculation sheets. The mechanical parts have been manufactured and assembled according to the design. The control strategy and control system have been developed by the students. The control system consists from hardware, such as electronic circuits, and software, such as motion control and user interface. The system has been established and tested. The tests prove the system workability and accuracy.

The project contains all the mechatronics branches. It contains mechanical system, which is controlled using electronic circuits. The control strategy is contained in software. All the system parts have been developed and executed by the students.

Department:	Mechatronics Engineering			
Project:	Metal Forming Machine			
Supervisor:	Prof. Dr. Nabil Gadallah			
Students:	6103740	Omar Ahmed Fouad	9109694	Osama Ibrahim Hussien
	7103122	Mohamed Mohamed Abu Quta	6103614	Rami Bebars Youssef
	6103253	Ahmed Wahid		

ABSTRACT

1-Basic Techniques of Metalworking:

Metalworking is the process of working with metals to create individual parts, assemblies, or large scale structures. The term covers a wide range of work from large ships and bridges to precise engine parts and delicate jewelry. It therefore includes a correspondingly wide range of skills, processes, and tools. Modern metalworking processes, though diverse and specialized, can be categorized as forming, cutting, or joining processes. Today's machine shop includes a number of machine tools capable of creating a precise, useful work piece.

2- Systems:

Metalworking generally is divided into the following categories:

Forming, cutting, and joining. The 1st. category has been chosen. These types of forming process involve the application of mechanical force at room temperature:

Bending, Deep drawing, Drawing, Spinning, Roll forming. Roll bending, Shearing and Stamping.

3- Advanced Techniques:

The steps of design of the metal forming Machine start with the literature Review of the different types of the machine (elaborated by the group) and the final choice is designed (by Ahmed Wahid, Rami Bebars Youssef and Osama Ibrahim Hussien) using Computer Aided Design and Solid Edge Package). The production of the machine is elaborated by (Omar Ahmed Fouad and Mohamed Mohamed Abu Quta). The Design of the machine contains: design of the structure, of the hydraulic system and of the control system.

Department:	Mechanical Engineering (Mechatronics)	
Project:	Master Slave Unmanned Vehicle	
Supervisor:	Prof. Dr. Salem A.Haggag	
Students:	Ibrahim Hesham Ibrahim	Mahmoud Ali Ahmed Elessawy
	Khaled Mohsen Helal	
	Omar Mohamed Afify	
	Omar Mohamed Mostafa Fouad	

ABSTRACT

Master Slave Unmanned Vehicle is designed to replace the human working in hazardous area, in order to protect the human beings (master) from subjecting to harmful materials and wastes, by controlling the robot (slave) through wireless communication protocol from a safe location and sends feedback for the critical surrounding parameters such as (temperature, robot speed, real vision of the working area) in which the robot works in. The project covers the following aspects:

1-Mechanical System Design:
Our Robot is designed to withstand bad and dangerous environment conditions like high pressure, high temperature, tough surfaces, contact obstacles, heavy loads. It is manufactured from sheet metal to minimize robot weight, and its steering system depends on tracks to perform its indented function.

2- Electrical and Electronic System Design:
Our low power system (Electronic) is represented in microcontroller (PIC 16F877A) which is the robot brain that controls the robot's reactions in response to various actions.
Our high power system (Electrical) is represented in actuators (DC motors) to control the robot's speed and direction by specified drivers (H-Bridge).

3- Human Machine Interface (Master):
The Master system can be divided into two levels:
First: A Wireless Remote Control that contains the transmitter wireless module that is responsible for giving orders to be performed by the robot (slave).
Second: PC Interfacing using a simple simulation program showing a simulated example for the robot that is used for receiving the feedback signals from the robot (slave) containing critical information through another transmitter module.

Department:	Mechanical Engineering (Mechatronics)	
Project:	Firefighting and warning robot	
Supervisor:	Prof. Dr. Salem A.Haggag	
Students:	Bishoy Osama Banob	Peter Maged Fawzy
	Tarek Ibrahim Mohamed	Shady Osman Shawki

ABSTRACT

This paper presents the effort that has been undertaken in designing and building both hardware and software for a fully autonomous firefighting and warning robot aimed for extinguishing fire application.

The challenge for such a project is to combine industrial high quality production for the firefighting with techniques for autonomous robot application and interaction which are currently best available in academic research.

The main objectives of the project are to design and control of a firefighting and warning robot that can detect, warn and extinguish a fire on its own by using a saved map. Many house fires originate when someone is either sleeping or not home. With the invention of such a device, people and property can be saved at a much higher rate with relatively minimal damage caused by the fire. Our task as mechatronics engineers was to design and build a system that could autonomously detect and extinguish a fire. In this Project we design a based Microcontroller autonomous Robot. It is the Robot that can move through a model structure, find a burning object and then extinguish it. This is meant to simulate the real world operation of a Robot performing a fire extinguishing function in a house or a factory.

This project introduces the basics of the autonomy and interactivity of the firefighting and warning robot while ensuring high robustness, reliability and performance. The result, called FFWR is an interactive emergency machine which can operate in human environments and interact with the fire autonomously as the robot is computer controlled and operates without any human intervention. An autonomous robot generally has an onboard computer which executes the software to interpret data from sensors, makes decisions, and controls the motors and other mechanisms. Autonomous robots must have sensors to gather information about the outside world such as light intensity, obstacles, and temperature.

Department:	Mechatronics Engineering	
Project:	Design and Construction of Twin Rotors Flying Robot	
Supervisor:	Dr. Sameh Shaaban	
Students:		

ABSTRACT

Flying robots are very important in different applications like mine detection. The present project aims at designing and manufacturing a flying robot with twin rotors. Several servo motors are also used to control the flight of the robot. The project covers the following aspects:

1-Design of the flying robot:
Students have designed their own flying robot with twin rotors and 4 servo motors.

2- Robot control:
The team has also designed a wireless remotely controlled system to control the robot flight from the ground.

3- Flying robot construction:
Students have constructed the robot while keeping its weight less than 300g to enable high operating time without the need to recharge the battery.

Department:	Mechatronics Engineering	
Project:	Design and Construction of Remotely Operated underwater Vehicle (ROV)	
Supervisor:	Dr. Sameh Shaaban	
Students:		

ABSTRACT

Remotely operated underwater vehicles (ROVs) are unoccupied, highly maneuverable underwater robots operated by a person aboard a surface vessel. They are linked to the ship by a group of cables that carry electrical signals back and forth between the operator and the vehicle. The project covers the following aspects:

1-Design of the ROV:
Students have designed their own ROV that can operate at depth more than 10m under the water.

2- ROV control:
The team has also designed and constructed the control system required to drive the ROV by a person aboard a surface vessel.

3- ROV construction:
Students have searched the local market in order to obtain all components required to construct the ROV. They successfully manufactured the ROV they designed during the project.

Department:	**Mechatronics Engineering**	
Project:	***Design and Implementation of Stair-Climbing Robot for Rescue Applications***	
Supervisor:	***Dr. Wessam M. A.M. Hussien*** ***Dr. Mohamed Misbah Elkhatib***	
Students:	Ahmed Alaa Eldeen	Amr Mansour Abo Elazem Mansour
	Mohamed Hesham Bayoumy	Ramy Sleem
	Motaz Magdy	

ABSTRACT

For disaster mitigation as well as for urban search and rescue missions, it is often necessary to place sensors or cameras into dangerous or inaccessible areas to get better situation awareness for the rescue personnel, before they enter a possibly dangerous area. Robots are predestined to this task, but the requirements for such mobile systems are demanding. They should be quick and agile and, at the same time, be able to deal with rough terrain and even to climb stairs. This project presents the design and implementation of a control system for an RF remote-controlled stair climbing robot. The robot is controlled using microcontroller. The project presents a complete integrated control architecture and communication strategy for a system of reconfigurable robots that can climb stairs. The main features of the robot include the supporting frame, tilt switch to adjust the angle of the platform, and wheels with triangular belt attached. We are developing the mechanism of Stairs climbing robot further by interfacing it with the microcontroller to make it an autonomous vehicle with decision making abilities. The operator can monitor the robot operation by using video that are captured through a camera on the surface of the robot.

Department:	Mechatronics Engineering	
Project:	*Design and Implementation of a Programmable Painting Robot For Houses and Buildings*	
Supervisor:	*Dr. Wessam M. A.M. Hussien* *Dr. Mohamed Misbah Elkhatib*	
Students:	Salah Eldin Tarek	Mohamed Badawy
	Mahmoud Idris	Ahmed Tohamy

ABSTRACT

Nowadays robots are widely used in many applications such as military, medical application, factories, entertainment, automobile industries etc. However, the application of robot is still not widely implemented in construction industry. In construction industry, robots are designed to increase speed and improve the accuracy of construction field operations. It can also be used to do hazardous and dangerous jobs in construction. To overcome these difficulties a Painting Robot and its Colors Mixer is constructed, since painting robots became very famous in industrial applications, our design is based on a robot which paints in X and Y axis and it can also rotate depending on the differential motion, the Mixer provides the paint to the robot after choosing between two options either providing the 4 basic colors percentage or choosing the color directly from a list, the mixer has 4 tanks containing filled with the paints based on the CMYK color chart.

Department:	Mechanical Engineering – Mechatronics	
Project:	**A CNC 3D node indexer**	
Supervisor:	**Dr. Mostafa Rostom A. Atia**	
Students:	Tarek Mostafa Mahmoud Mohamed	
	Omar Ismaail Hassanin	
	Khaled Bader El Dean	
	Amr Hassan Amr Zahran	

ABSTRACT

Trusses are very important style for building constructions. Nowadays, The node trusses give a great flexibility to construct very complicated shape buildings. This type of trusses is based on balls and links. The balls are drilled and taped in 3D angles. In many trusses, the balls have different sizes and they are taped in different angles. Traditionally, these balls are manufactured using 5-axes CNC machines. The present project, introduces a new machine, which produce these balls using only four axes and use conventional drilling machine. The machine will index the balls in spherical coordinate for drilling and taping. The indexing operation is fully controlled via a CNC system.

During the project, the students have designed the mechanical part of the CNC system. This includes the preparation of engineering drawing, workshop drawings and calculation sheets. The mechanical parts have been manufactured and assembled according to the design. The control strategy and control system have been developed by the students. The control system consists from hardware, such as electronic circuits, and software, such as motion control and user interface. The system has been established and tested. The tests prove the system workability and accuracy.

The project contains all the mechatronics branches. It contains mechanical system, which is controlled using electronic circuits. The control strategy is contained in software. All the system parts have been developed and executed by the students.

Department:	Mechanical Engineering	
Project:	Service Mobile Robot	
Supervisor:	Ass. Prof. Dr. Ibrahim A. El-Sherif	
Students:	Moataz Talaat	Mostafa Wahdan
	Mohamed Soliman	

ABSTRACT

The goal with this project is to develop an autonomous sweeper robot. The mission is to make the robot clean the room with building the action logic of the robot with controller software and invoking simple hardware. The project covers the following aspects:

1. A vehicle as a platform for carrying cleaning device
Chassis design production and assembly, steering system design, transmission gears design and manufacturing, driving axles design and fixation of the robot components.

 2. A sensory system that monitoring the robot operation and surrounding environment

3. A control unit,
The controller software handles the events from vision sensors, decides the robot's action and sends command to its driving system and the vacuum cleaner.

The practical part includes building of the designed system.

Department:	Mechanical Engineering, Mechatronics Department	
Project:	**Development of an Automated Manual Gearbox**	
Supervisor:	**Dr. Salem A. Haggag**	
Students:	Kamal Ashraf Kamal Kamel	
	Mohamed Hassan Sabry	
	Mohamed Sherif Anwar	
	Abd-elghani Abo-elnaga	

ABSTRACT

The objective of the Automated Manual Transmission graduation project is to develop add-on solution that can be used to automate the conventional manual gearbox. This basically will provide the comfort of the conventional automatic transmission and the efficiency of the stick shift manual transmission. During the project a compact and in the same time intelligent electro-mechanical actuator will be designed and manufactured that can be fitted in most common cars available. This actuator will activated the gearbox stick to the suitable required shift based on the car operation condition. The actuator receives multiple signals such as the car engine speed, the car speed, clutch position and brake position. These signals will be used by the system electronic control model (microcontroller based controller) and control the electro-mechanical actuator on the top of the gear box stick.

The prototype -with some optimization and upgrades- should prove very useful in the automotive field and could provide the comfort and fuel efficiency that is highly required in the automotive industry nowadays.

Department:	**Mechanical Engineering Department**	
Project:	**Solar Water Heater with Tracking System**	
Supervisor:	**Dr. Sameh Shaaban**	
Students:	Ahmed Fayk Mohamed Fawze	Mahgoob Hasan Kasem
	Hazem Mokbel Mohamed Bybers	
	Omar Abd Elrazak Negm	

ABSTRACT

Arab countries have huge amounts of available renewable energies. Solar energy is the most important available source of renewable energy for all Arab countries. Therefore, the present project aims at designing and manufacturing a solar water heater with solar tracking system. The solar tracking system insures that the solar radiation is perpendicular to the solar collector all the day. Consequently, the solar water heater with tracking system maximizes the use of solar energy and reduces the need for fusel fuels.

The project consists of a solar collector that rotates around two of its axes. Sensors are used in order to detect the direction of solar radiation. A number of actuators rotate the collector until the solar radiation becomes perpendicular to the collector surface.