

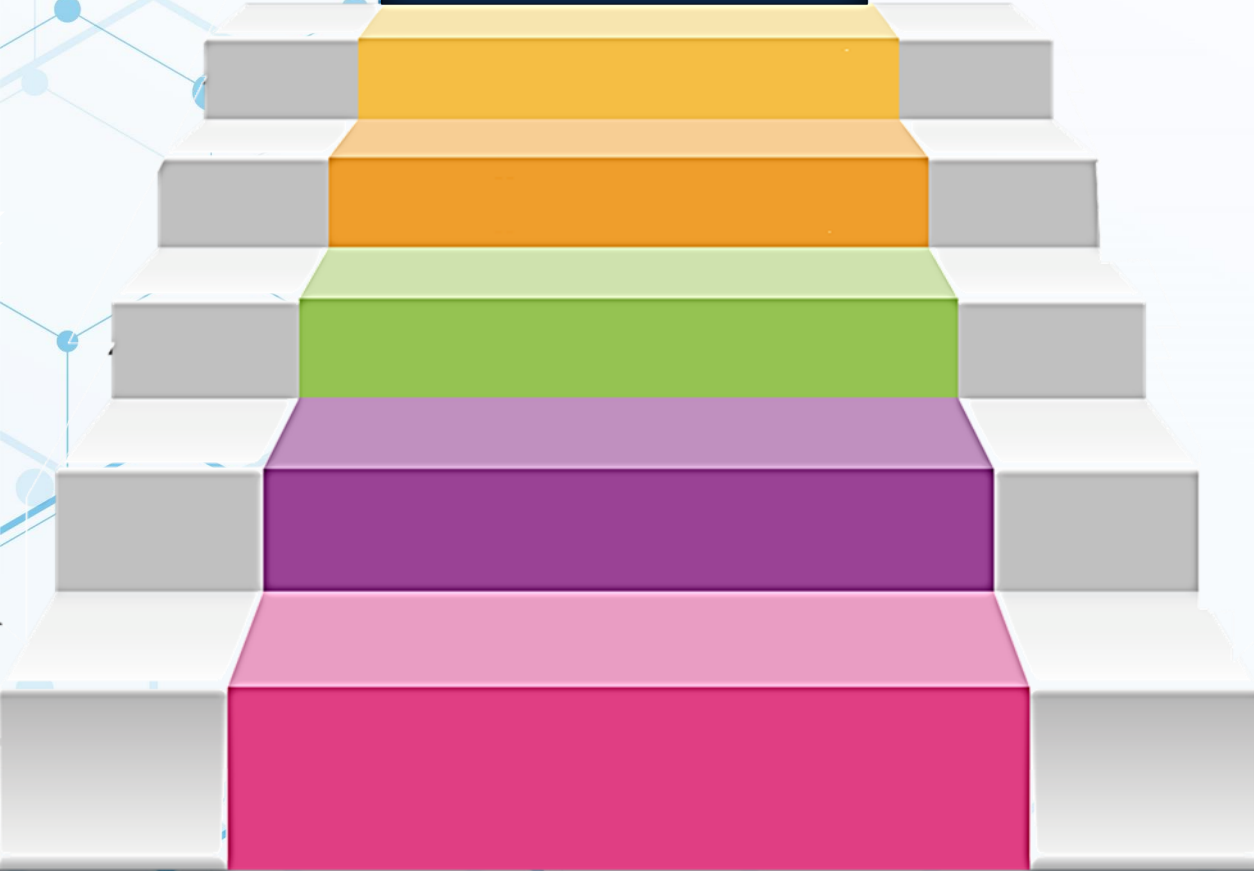
رحلة طالب هندسة القوى الميكانيكية ...

من الالتحاق وحتى سوق العمل

إعداد

د. محمد مصطفى توفيق

مدرس بقسم هندسة القوى الميكانيكية
كلية الهندسة - جامعة المنصورة



سوق العمل

1



شركات
البتترول



محطات
تحلية البحر

محطات توليد
الكهرباء



المحطات
النوية

محركات
السيارات



الطاقة
الشمسية



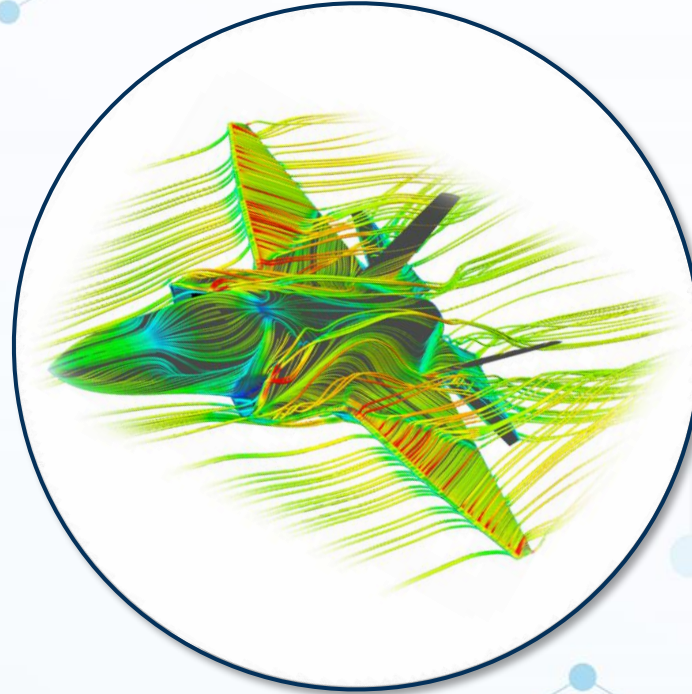
مزارع
الرياح

التبريد
والتكييف





THERMODYNAMICS

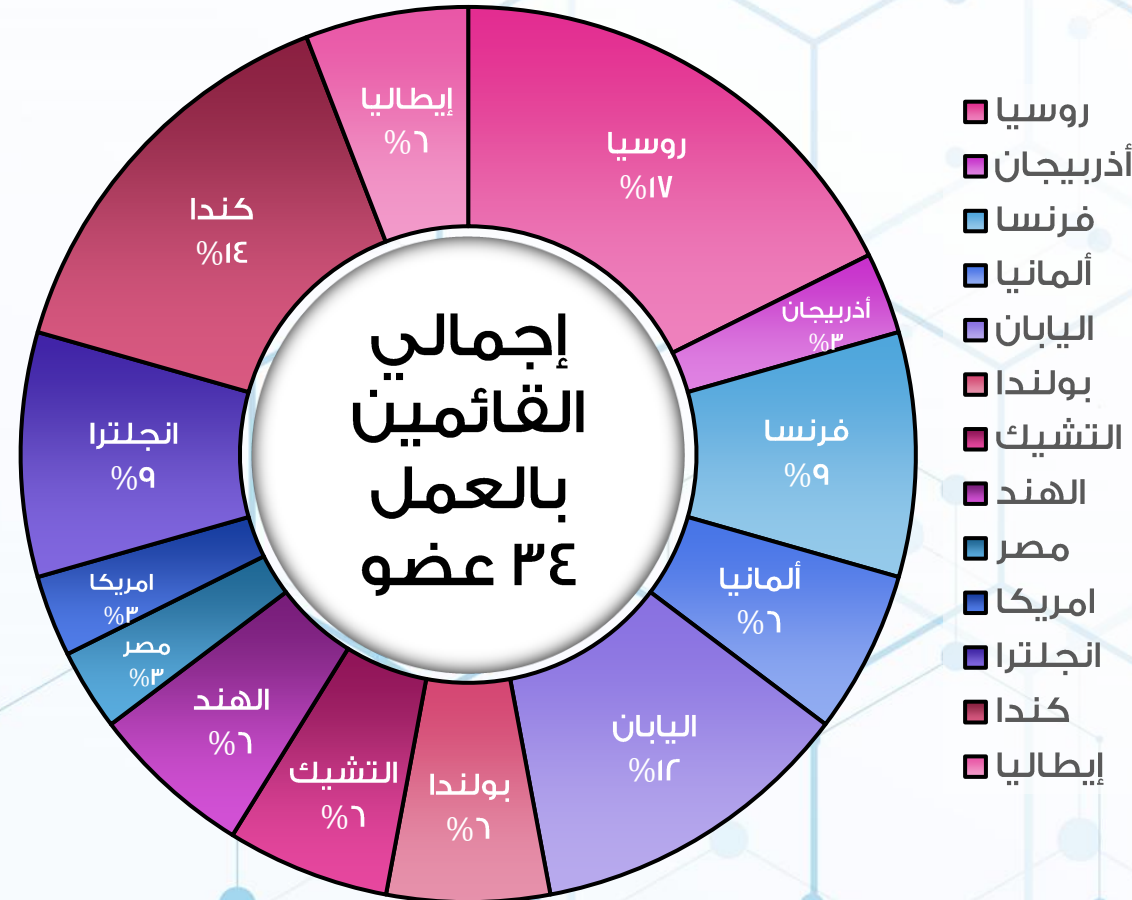
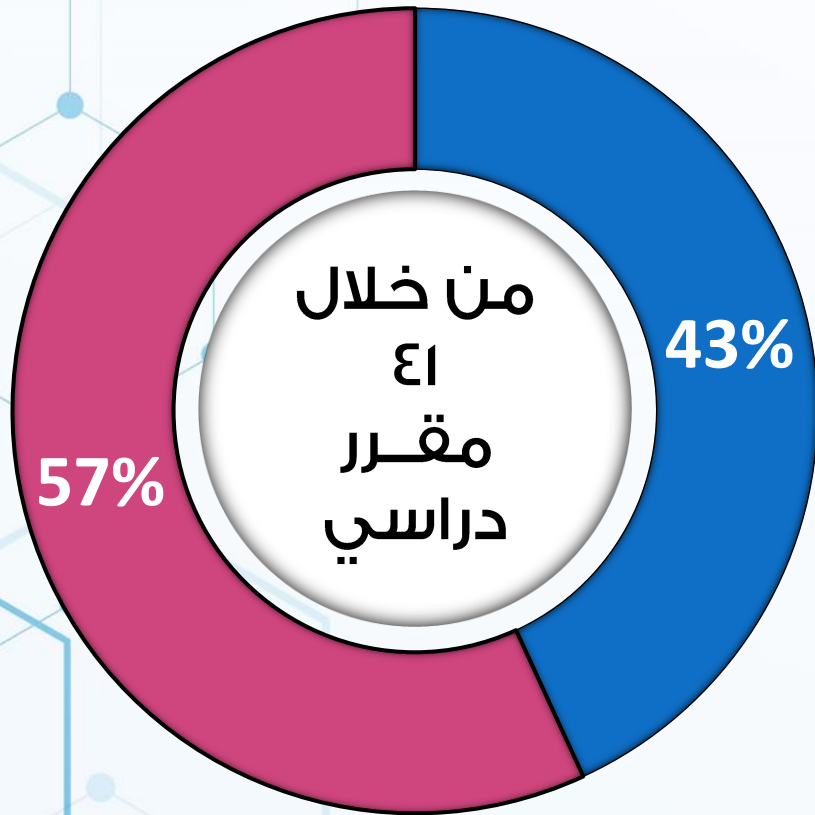


FLUID MECHANICS



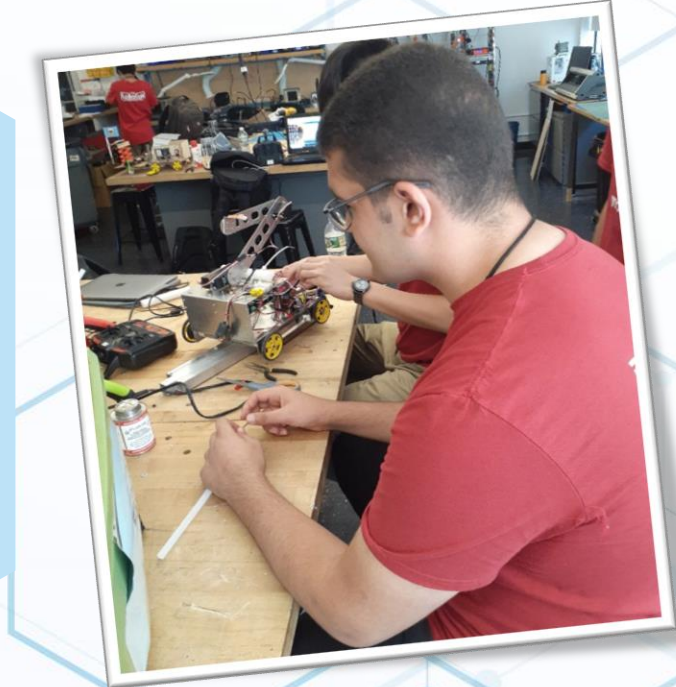
COMBUSTION

■ فوق سن الـ ٦٠ ■ تحت سن الـ ٦٠

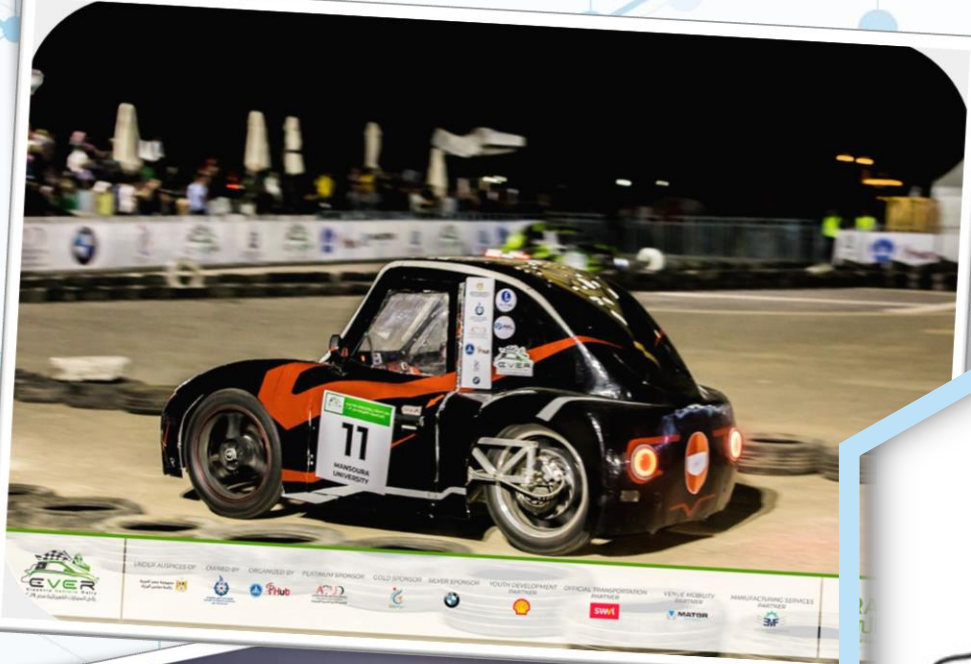




(أغسطس ٢٠١٩)



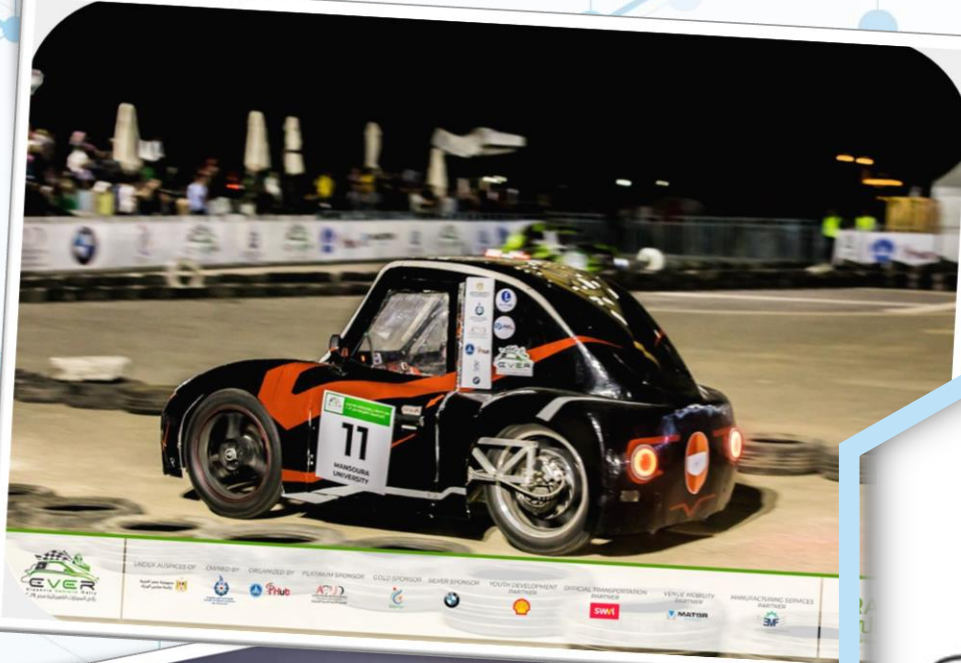
حصل فريق الطالب/ يحيى حلمي **المركز الثاني** في المسابقة العالمية – روبوكون – والتي عقدت بمعهد ماساتشوستس للتكنولوجيا MIT



حصل الفريق علي **المركز الثاني** بين ١٥ فريق في المسابقة التسويقيه الخاصة بشركة **Shell** العالمية و جائزه قدرها ١٥ الف جنيه مصري



حصل الفريق علي جائزة أفضل فريق مشارك للمرة الأولى
Best new comer's



حصل الفريق علي المركز الرابع علي المسابقة بشكل عام



رحلة علمية إلى منظومة التكييف الشمسي
جامعة أسيوط
(فبراير ٢٠١٩)



رحلة علمية إلى محطة الكريمات للطاقة الشمسية
هيئة الطاقة الجديدة والمتجددة
(إبريل ٢٠١٩)



المشاريع الطلابية

5

مشاريع مصغرة
Mini Projects

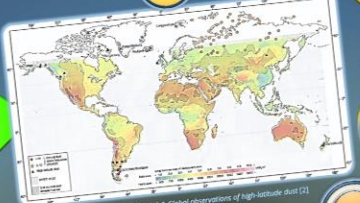
1



Design of Closed Parabolic Trough for Hybridization

El-Shafei Zidan, Mohamed Tawfik, Abdelrahman A. Behis, Ahmed E. Mohamed, Ahmed M. Abdel Razik, Ahmed A. Fahmy, Hesham M. Abdel Aziz, Ahmed S. Abdel Fattah, Ahmed R. Al Moselhy, Ahmed F. Turkey
Mechanical Power Engineering Department, Faculty of Engineering, Mansoura University, Mansoura, Egypt

INTRODUCTION

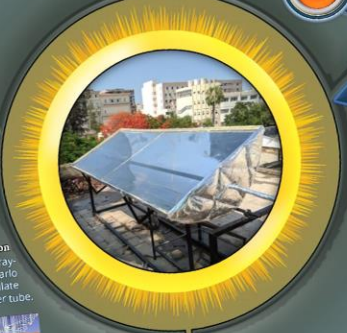


Problem Description
The largest solar power availability lies approximately within the 0-50° latitude range [3], which the same range of the high-latitude dust source [4].

Closed Parabolic Trough (CPT)
CPT is designed to overcome cleaning problems facing the conventional Open Parabolic Trough (OPT) design.

AIM
The project aims to hybridize the conventional fossil fuel structure boiler, available at Energy Laboratory, Mansoura University with solar energy.

SYSTEM DESIGN



(a) Parabola Design
The parabola curve is designed to get the focal point near the middle of the parabola's major axis to avoid local thermal stress that might affect the glass cover.

(b) Receiver Tube Diameter Evaluation
To avoid missing reflected rays, a ray-tracing software based on the Monte Carlo method, called **Tonatiuh**, is used to simulate the solar radiation on reflected over the receiver tube.

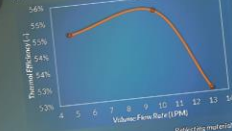


(c) Receiver Performance Improvement
To enhance the performance of the thermal receiver tube, the present study suggested dividing the selected 1.5-inch tube into 3 smaller pipes with O.D. 0.518-inch each. This increased the total heat transfer area by at least 116%.



RESULTS & CONCLUSIONS

(a) System Conversion Efficiency
Experiments performed on an open loop water test, carried out at Solar Energy Lab, Mansoura University (31.0°N, 31.4°E), Egypt, indicated that the system achieved an average conversion efficiency of 54% at different water flow rates.



(b) Cost Analysis
The system costs about \$ 630 for an aperture area of 2.5m², with a maximum cost share is for the tracking components, while the biggest share is for the steel structure. Results indicate that to cut down the system cost, it is required to put more effort into minimizing the tracking costs and changing the structure materials with no significant effect on the system robustness under thermal and wind loads.



BIBLIOGRAPHY

- [1] Solargis. Global Direct Normal Irradiation 2019. <https://solargis.com/maps-and-gis-data/download/world/> (accessed September 11, 2019).
- [2] Bullard Jr., Baddock M., Bradwell T., Crustius J., Darlington E., Galero D., et al. High-latitude dust in the Earth system. *Rev Geophys* 2016;54:447-85. doi:10.1002/2016RG000518.
- [3] Tiwana NS. Simulation Modeling and Optimization of the Performance of the Solar Water Heating System at the Southland Leisure Centre, University of Calgary, 2017.
- [4] Bullard Jr., Baddock M., Bradwell T., Crustius J., Darlington E., Galero D., et al. High-latitude dust in the Earth system. *Rev Geophys* 2016;54:447-85. doi:10.1002/2016RG000518.

This project is funded by Academy of Scientific Research & Technology (ASRT)



المشاريع الطلابية



Poster participated in **The 25th SolarPACES Conference, Daegu, South Korea (October 2019)**

مشاريع تخرج Capstone Projects



MANSOURA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL POWER ENGINEERING DEPARTMENT

IMPROVEMENT OF COMMERCIAL REFRIGERATORS TO CONSERVE ENERGY

Ahmed G. Sadek Atef A. Salah Mohamed G. Abd-Elhady Mostafa G. Zakarya
Dr. Mohamed Tawfik

PROBLEM STATEMENT
Frequent opening a commercial refrigerator door, increases its cooling load due to hot air infiltration into the cooled chamber. Consequently, this increases the electric consumption of refrigerator.

EXPERIMENTS
3-experiments are carried out to measure & compare the energy consumption of a commercial refrigerator at 3 different operating conditions: closed, open without & with 150 W-air curtain, respectively.

PROJECT AIM
This project aims to evaluate the average amount of energy wasted due to customer behaviour and to test a solution of using automatic air curtain that operated via a PIR sensor signal before opening the refrigerator door to keep the refrigerated air trapped in the cooled chamber. The amount of energy saving and the cut in electric bills paid by the vendor will be evaluated.

RESULTS & CONCLUSION
The results showed that using the air curtain can save up to 10% of energy consumption at the same refrigerator door opening pattern & room ambient temperature. This led to save about 600 EGP/year out of the vendor's electric bills, with money-back time of approximately 1.7 years.

Example of a poster selected to participate in **The 1st Project Poster Exhibition, Faculty of Engineering, Mansoura University (July 2019)**



أكاديمية البحث
العلمى والتكنولوجيا
Academy of Scientific
Research & Technology



تمويل ٣ مشاريع طلابية مقدمة من القسم من أصل ٥ مشاريع تم
تمويلها لهندسة المنصورة عام ٢٠١٩ من خلال برنامج

مشروعى بدائتى

إجمالى التمويل ١٢٢ ألف جنيه



USAID
FROM THE AMERICAN PEOPLE

تمويل ٨ مشاريع طلابية مقدمة من القسم عام ٢٠٢٠ من خلال برنامج
UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM (UROP)

إجمالي التمويل ٨٠٠ ألف دولار



*Thank
you*