



CURRICULUM VITAE

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Education:

- **Arab Academy for Science, Technology and Maritime Transport.**
Master's Degree, Mechanical Engineering, **Excellent with Honors.**
(2012 – 2016).
Thesis Title: Gain Scheduling Control on Direct Drive 2-DOF Arm Robot as a Nonlinear System.
- **Arab Academy for Science, Technology and Maritime Transport, 2012**
Bachelor's Degree, Mechanical Engineering , Mechatronics.
GPA (3.85/4), Excellent with Honors.
 - **ABET Accredited** (Accreditation Board for Engineering and Technology)
- St. Fatima Language School, Egyptian High School, 2007.
Math and Physics Section, Grade 93%.

Teaching Experience:

- **Graduated Teaching Assistant**, Dept. of Mechanical Engineering, Arab Academy for Science, Technology and Maritime Transport (AASTMT), Sheraton Branch (present September 2012).

Courses:

- Engineering Drawing & Projections.
- Mechanical Engineering Drawing.
- Computer Aided Design.
- Stress Analysis.
- Heat Transfer.
- Computational Fluid Dynamics (CFD).
- Mechatronics.
- Mechatronics Systems.
- Robotics & Applications.
- Automation of Mechanical Systems.

Educational Courses:

- Basics of Microcontroller Applications using C++.
- Basics of MATLAB/Simulink.
- International Computer Driving License (ICDL).
- Educational Training Program for Teaching Assistants and Lecturers.

Training Courses:

- Maintenance and investigation skills at **EgyptAir** (Cairo Airport).
- Heavy Trucks Troubleshooting and Maintenance at **Arab Contractors**, Egypt.
- Internal Combustion Engines course – **Mercedes GAS**.

Master's Degree Courses: (Total Grade, Excellent)

- Advanced Fluid Mechanics.
- Advanced Heat - Mass Transfer and Thermodynamics.
- Advanced Computational Methods.
- Renewable Energy.
- Advanced Dynamics.
- Advanced Automotive Technology.
- Simulation and Modeling of Mechanical Systems.
- Research Methods.

Master Thesis Abstract:

The master thesis examined the way in finding a systematic procedure to come out with a controller that guarantees the stability and high performance in the presence of uncertain nonlinear behavior. Robots provided the most used nonlinear industrial machine. A direct drive 2-DOF arm robot has been selected as a nonlinear mechanical system. The proposed controllers have the characteristics of linearity and homogeneity in its design compared to the nonlinear controllers, therefore a very promising output had been showed relative to the previous techniques. High accuracy trajectory tracking control is a very challenging topic in direct drive robot control. This is due to the nonlinearities and input couplings present in the dynamics of robotic arms. Linearization scheduling algorithm had been applied on the robot trajectory with stability analysis study. Two Controls were used and applied on the robotic arm, Gain-scheduling control with multi-loop PID technique and Simplified universal intelligent-PID. Verification had been done with Fuzzy logic controller.

Publications:

- Khaled M. Helal, Mostafa R. A. Atia, Mohamed I. Abu El-Sebah, "*Gain-Scheduling Control with Multi-loop PID for 2-DOF Arm Robot Trajectory Control*". Proceedings of the IRES 23th International Conference, Dubai, UAE, 29th December 2015, p.19-25.

Educational Projects:

- "**Master Slave Unmanned Vehicle**" – **Graduation Project (Project Grade: Excellent)**.
- Stress analysis on Screw Jack mechanism.

- Experimental measuring of deflection and stresses on Cantilever beam using strain gauge and LabView as an interfacing software.
- Practical implementation of simple suspension system to overcome the vibrations resulting from a half-circle wheel connected to DC-motor shaft.
- Proportional Speed Control on a DC-motor using Optical Encoder.
- Furnace Temperature control.
- Power Assist System modeling using MATLAB/Simulink.

General Skills:

- Good command in English (Writing and Speaking).
- Fluent in Arabic (Mother Tongue).
- High communication and leadership skills.
- Team working.
- Microsoft Office Proficiency.

Engineering Skills:

- Mechanical Drafting and Design using **AutoCAD, Solid EDGE and Inventor.**
- Mechatronics Systems Modeling using **MATLAB/Simulink.**
- Microcontrollers Applications using **C-programming Language.**
- Hydraulic systems Design and Modeling using **Automation Studio, Fluid Flow.**
- Printed Circuit Board layout design using **Circuit Wizard, ISIS Pro and Proteus.**

Professional Memberships:

- Egyptian Syndicate of Engineers.
- Federation of Arab Engineers.

Honors and Awards:

- Master's degree scholarship, AASTMT, 2012-2016.

Favorites:

- Soccer.
- Physical exercising and Workout.
- General Reading.
- Playing Music.

References:

Mostafa Rostom Ahmed, Ph.D

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References available upon request.