

Zeyad M. Manaa

Department of Aerospace Engineering,
King Fahd University for Petroleum and Minerals, Dhahran, 31261, Saudi Arabia
[LinkedIn](#), [GitHub](#), [Scholar](#)
<https://zmanaa.github.io/>

Education **King Fahd University for Petroleum & Minerals (KFUPM)** *Jan. 2023 – present; Saudi Arabia*
M.Sc. in Aerospace Engineering (Cum Laude)
Thesis: “Data-driven Approaches for Flight Dynamics Modeling and Control – On Linear and Nonlinear Techniques for Dynamics Identification and Control”

University of Science and Technology at Zewail City (UST-ZC) *Sep. 2017 - May. 2022; Egypt*
B.S. in Aerospace Engineering
Thesis: “Development of the software package for the attitude determination and control algorithm of a cube satellite”

Interests Data-driven modeling and control of dynamical systems – Control theory and optimization – Model reduction and feedback control of dynamical systems – Event-triggered control

Refereed publications **Journal Papers**
[1] [Novel Airfoil for Improved Supersonic Performance](#)
Zeyad M. Manaa, Naef A. A. Qassem
The International Journal of Numerical Methods for Heat and Fluid Flow, 2024

Conference Proceedings
[2] [Data-driven Discovery of The Quadrotor Equations of Motion Via Sparse Identification of Nonlinear Dynamics](#)
Zeyad M. Manaa, Mohamed R. Elbalshy, Ayman M. Abdallah
AIAA SCITECH 2024 Forum, AIAA (p. 1308)

[3] [Koopman-LQR for Quadrotor UAVs from Data](#)
Zeyad M. Manaa, Ayman M. Abdallah, Mohamed A. Abido, Syed S. A. Ali
Accepted for publication in IEEE SM 2024

[4] [Optimum Configuration for Hovering N-Quadrotors Carrying a Slung Payload](#)
Mohssen M., Pansy Elkhodary, Meral Badr, Mohammed Sayegh, Zeyad M. Manaa, Ayman M. Abdallah
Accepted at AIAA SCITECH 2025 Forum

[5] [Dynamic Stability Performance Analysis of The BWB Skywalker X-8](#)
Taha Najam, Anafi Sheriffdeen Olayinka, Abdul Motayib, Moses James Kehinde, Syed S. A. Ali, Zeyad M. Manaa, Ayman M. Abdallah
Accepted at AIAA SCITECH 2025 Forum

Preprints

[6] [KINETC: Koopman-Inspired Nonlinear Event-Triggered Control from Data](#)
Zeyad M. Manaa, Ayman M. Abdallah, Sami El-Ferik
Submitted to IEEE Access

Patents [7] [Efficient Airfoil for Improved Supersonic Performance for Fighters](#)
Naef A. A. Qassem, Zeyad M. Manaa
Patent ID. 550544US. Status: filed

Research experience **KFUPM, Space and Aviation Electronics Lab** *Jan 2023 – Present; Dhahran, Saudi Arabia*
Research Assistant

- Researching Koopman operator to globally linearize nonlinear dynamics
- Exploring novel techniques for adaptive and model predictive control using new data-driven techniques
- Developing data-driven event-triggered control frameworks

NUST, Aerial Robotics Lab *Jun 2022 – Aug 2022; Islamabad, Pakistan*
Research Intern

- Developed an autonomous control system for a quadrotor UAV using Tello and COEX Clover devices with ROS

	Egyptian Space Agency, ADCS Lab <i>Research Intern</i>	<i>Aug 2021 – Jul 2022; Cairo, Egypt</i>
	<ul style="list-style-type: none"> Conducted the bachelor's thesis research under co-supervision of the Egyptian Space Agency and University of Science and Technology at Zewail City on spacecraft attitude determination and control subsystem Developed the software of the attitude determination and control algorithm of a cube satellite which decreased the detumbling time of the cube satellite Studied and implemented the space environment as a means of Earth's Magnetic Field (IGRF Model), Earth's gravitational field (using Spherical Harmonics) as well as modeling the space disturbances 	
<i>Internships</i>	EgyptAir Maintenance and Engineering <i>Aircraft Maintenance Intern</i>	<i>Jun. 2022 – Aug. 2022; Cairo, Egypt</i>
	Cairo University <i>Undergraduate Visiting Student – Space Systems Technology Laboratory</i>	<i>Aug. 2021 – Jul. 2022; Cairo, Egypt</i>
<i>Teaching</i>	Courses Taught	
	[1] AE 426 ; Fall 2023: Introduction to Flight Mechanics (Undergraduate Course)	
	[2] AE 315 ; Fall 2023: Systems and Control (Undergraduate Lab); overall evaluation: 9.56/10.0	
	Teaching Assistantships	
	[3] AE 540 ; Spring 2024: Flight Dynamics and Control I (Graduate Course)	
	Teaching-related Activities	
	[4] AE 350 – CIE 350 ; Summer 2023: Monitored undergraduate students' cooperative work in Aerospace Engineering and Control & Instrumentation Engineering Departments	
	[5] AE 399 – CIE 399 ; Summer 2023: Oversaw undergraduate students' summer internships workflow in Aerospace Engineering and Control & Instrumentation Engineering Departments	
<i>Talks</i>	Koopman Meets LQR for Quadcopters using Data Host: IEEE @ OntarioTech.	<i>Sep. 2024; Ontario, Canada</i>
	Data-driven Modeling and Control in Aerospace Applications Host: KIKX @ KFUPM. (Approximately 50 attendees).	<i>Mar. 2024; Dhahran, KSA</i>
	Data-driven Discovery of The Quadrotor Equations of Motion Via SINDy Host: AIAA	<i>Jan. 2024; FL, USA</i>
	On POD and DMD for aerodynamic application Host: Aerospace Department, KFUPM.	<i>May 2023; Dhahran, KSA</i>
	Convex optimization for thin airfoil design using linear flow theory Host: Aerospace Department, KFUPM.	<i>Mar. 2023; Dhahran, KSA</i>
<i>Fellowships and awards</i>	Mohammad Al-Aqeel Grant for Graduate Students	<i>KFUPM, 2023</i>
	Graduate Intl. Research Assistance Scholarship	<i>KFUPM, 2023</i>
	Research Intern Scholarship for Intl. Students	<i>NUST, 2022</i>
	Future Work is Digital Scholarship	<i>Ministry of Communications and Information Technology, 2022</i>
	Smart City Hackathon: 1st Place Award in global finals	<i>DAN & Global Project Germany, 2019</i>
	Undergraduate Fellowship	<i>UST-ZC, 2017</i>
<i>Skills</i>	Programming: Python (3 yrs.), MATLAB (4 yrs.), C++ (1.5 yrs.), Julia (basic) Frameworks: Pytorch, OpenCV, Sci-Kit, CVX/PYCVX Other skills: GIT, SolidWorks, ANSYS, Mathematica, bash-scripting, Jupyter Notebook, LaTeX Languages: Arabic (Native), English (C1, IELTS: 7)	
<i>Services</i>	Conference Reviewer: IEEE SMILE 2024, IEEE eSmarTA, 2024, AIAA SCITECH, 2023 – 2024	
<i>Leadership experience</i>	Media Committee Head, Euroavia Zewail City Managed a team of 10 people for the Euroavia Egypt student branch	<i>Egypt, 2020</i>
	Media Committee Head, Zewail City Science Festival Managed a team of 15 people for the Zewail City Science Festival mega event	<i>Egypt, 2019</i>