

## AHMAD S. AL-TAWAHA

The Department of Electrical and Computer Engineering  
Virginia Tech  
Blacksburg, VA

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### PERSONAL INFORMATION

Nationality: Jordan  
Place of Birth: Irbid - Jordan  
Date of Birth: 07.02.1993

### RESEARCH INTERESTS

- Optimization
- Machine Learning
- Low rank approximation
- System identification
- Linear control systems design

### EDUCATION

Ph.D. Student, The Department of Electrical and Computer Engineering (Aug 2021-present)  
Virginia Polytechnic Institute and State University, Blacksburg, VA  
Advisor: Ming Jin

M.S., Mechanical Engineering–Mechatronics (July 2021)  
Jordan University of Science and Technology, Irbid, Jordan  
Thesis: Model Order Determination with Applications in System Identification, Image and Signal Processing  
GPA: 4.2/4.4

B.Sc., Aeronautical Engineering (November 2016)  
Jordan University of Science and Technology, Irbid, Jordan  
GPA: 86.7%  
Graduated top of class out of 40 students (1/40)

Main courses: Probability and Random Processes, Artificial Intelligent Systems, Signal and Image Processing, Automatic Control, Advanced Control Systems, Robotics, Autonomous Mobile Robots, Advanced Applied Mathematics

### AWARDS

- Awarded a full scholarship from Jordan University of Science and Technology for graduate studies in Jordan (2018 – 2020).
- Awarded Jordan's Ministry of Education Scholarship for Undergraduate Studies in Jordan (2012 – 2016)

### HONORS

- Graduated top of class out of 40 students, Aeronautical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan (2016)

## EXPERIENCE

- February 2018 – May 2021: Research Assistant, Mechanical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan:
  - Introduced a novel approach for noise reduction and data compression in signal and image processing based on singular value decomposition “SVD”.
  - Introduced a novel algorithm to approximate the order of a linear system from the singular values of the Hankel matrix constructed from the estimated Markov parameters of the system.
- September 2018 – July 2020: Teacher Assistant, Mechanical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan:
  - ME214: Strength of materials
  - ME211: Statics
  - ME312: Mechanic of materials lab
  - ME304: Engineering economics and management
- November 2016 – October 2017: Research Assistant, Aeronautical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan:
  - Utilizing vacuum bagging process to enhance bond strength between FRP sheets and concrete
  - Measure the improvement of the mode I interlaminar fracture toughness of carbon fiber composite reinforced with electrospun nylon nanofiber

## COURSE PROJECTS

- Modeling and Analyzing a 6 DOF Serial Manipulator
  - Obtaining the dynamic model using Lagrange’s method, forward kinematics, inverse kinematics using Piper’s method, and trajectory planning. Matlab and Mathematica were used.
- Detection of Skin Cancer Using Artificial Intelligence Techniques
  - Image processing is used to detect the early stages of skin cancer. In the first stage, a sample of 150 images, collected from well documented literature, are used. The images were classified based on 12 features (mean, standard deviation, compactness index, skewness, kurtosis, color variation, asymmetry index, entropy, energy, contrast, correlation and homogeneity). In the second stage, artificial neural networks (ANN) were utilized to detect abnormal growths of cells on the skin.
- Sumo Robot
  - Designing and programming a self controlled Sumo Robot with specific dimensions, weight, and features to participate in a competition with other robots. Pro-Engineer drawing software is used to design the robot’s outer shell. Ultrasonic and IR sensors, Dual H Bridge, and DC-motors are connected to the micro-controller ”Arduino-Uno”, programmed using Arduino Software (IDE).
- Rotating Cylinder over NACA 0024 Airfoil
  - Experimental investigation of the effects of smooth and longitudinal scratch rotating cylinder on aerodynamic forces over NACA 0024 airfoil in a low-speed wind tunnel. A DC motor with a speed controller is used to control the angular speed of the rotating cylinder in an attempt to improve the lift force at high angle of attack.

## SKILLS

- Software: Matlab, Simulink, C++ Programming, Mathematica, L<sup>A</sup>T<sub>E</sub>X, ANSYS, Pro-Engineer, XFLR.
- Hardworking, devoted, and self-motivated
- Team participating and capable of interacting with a multinational environment

## PUBLICATIONS

### Journal Papers:

- J1) **A. S. Al-Tawaha**, K. F. Aljanaideh, A. Alshorman “Low Rank Approximation Using Singular-Values Noise Level Estimation ”, *International Journal of Control*, submitted.

### Conference Papers:

- C1) **A. S. Al-Tawaha**, K. F. Aljanaideh, A. Alshorman “A Singular Value Thresholding Algorithm for Order Estimation”, *American Control Conference*, pp.4478–4483, New Orleans, LA, 2021.

## REFEREES

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