

# ABDUL HANNAN KHALID

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## EDUCATION

M.Sc. – Mechanical/Aerospace Engineering  
B.Sc. – Mechanical/Aerospace Engineering

Arizona State University  
Institute of Space Technology

CGPA: 3.74/4  
CGPA: 3.22/4

August 2019  
September 2013

## TECHNICAL SKILLS

**Core Areas** : Mechanical Design, Product Development, Heat Transfer, Fluid Mechanics, CFD, FEA  
**Programming Languages** : C++, MATLAB  
**Software Expertise** : ANSYS, FLUENT, MATLAB, Minitab, LabVIEW, Chemkin, Workbench, SolidWorks, Autodesk Inventor, PTC Creo, AutoCAD, CFX, PRO-E, EES, SIMULINK, Mathematica, NASA CEA, MS Office  
**Tools** : 3D modeling, Additive manufacturing, Injection Molding, Machine shop, Gas chromatography, LabVIEW data acquisition with NI-DAQmx, Wind tunnel testing, NPI, QBlade, GD&T, ASME Y14.5, DMAIC, DFA, Instrumentation(sensors and actuators), CSSWB, Six Sigma, SPC, DFMEA, DFM, RCA  
**Professional Organizations** : Combustion Institute, ASME

## WORK EXPERIENCE

### Mechanical Design Engineer – Forged Droid Phoenix(SolidWorks)

Dec 2019 – Present

- Revamping a full body(head, hand, neck, torso, etc.) mechanism for a humanoid robot using **SolidWorks**
- Developing rovers for food delivery(outdoor) as well as UVC disinfection(indoors) from the bottom-up approach
- Reviewing design drawings and specifications to ensure all components have been installed correctly and meet requirements
- Performed design verification and validation to meet the specifications
- Accelerating the development using **additive manufacturing** of body parts using ABS & integrating sensors for haptic feedback

### Graduate Teaching Assistant – Arizona State University(MATLAB, LABVIEW, NI-DAQmx)

Aug 2017 - May 2019

- Administered aerodynamics lab(low subsonic wind tunnel, shock tubes, supersonic wind tunnels, design of experiment)
- Set-up lab equipment and data acquisition using **NI-DAQ** and **LabVIEW**
- Mentored students with homework, lab assignments as well as designing new experiments for analysis

### Product Development Engineer – PMC(SolidWorks, ANSYS, FLUENT)

Nov 2014 - Mar 2016

- Led the development of a nozzle including design verification, validation, and commissioning
- Performed nozzle CFD, heat and mass transfer, shape, and area ratio optimization
- Analyzed thrust loss due to regenerative cooling of a bell-shaped nozzle using **ANSYS FLUENT**
- Worked closely with the manufacturing team to turn over design files to perform fabrication of the nozzle and track projected fabrication and delivery dates

### Trainee Engineer – Shaheen Air International(SEAMS)

Jan 2014 - Oct 2014

- Base/line maintenance of aircraft including Airbus(A330-200, A320-200) & Boeing(B737-400)
- Followed detailed maintenance procedures as per the manufacturer's quality and safety standards documentation

## PROJECTS

### Low Temperature Soot Regime of Propane in a Micro Flow Reactor( $\Phi=2.3\text{mm}$ ) with Controlled Temperature Profile – Thesis(Masters)

- Investigated the dependence of critical sooting equivalence ratio of propane/air on temperature(750-1250°C) in a cleanroom
- Developed an interface using **LabVIEW** for data acquisition to control gas flow rate as well as the temperature of the **reactor**
- Ascertained the exhaust gas composition using a gas chromatograph (Shimadzu GC 2014) fitted with TCD and FID
- Suppressed the soot formation by decreasing temperature

### Shape Memory Alloy(SMA) Simulations and Applications in Aerospace Industry – Final Year Project B.Sc. (ANSYS, MATLAB, LABVIEW)

- Furthered the research to use SMA wires to actively work as a precise empirical position controller to actuate flaps
- Developed testing and characterization procedures for the novel SMA
- Led the development of an experimental setup for real-time acquisition of variables like temperature, initial strain, and stress
- Validated the vibration control of composite panels using SMA as reinforcement using **MATLAB** and **ANSYS**(modal analysis)

### Development of an Analysis Tool for Basic Parametric Study of a Non-Ideal Ramjet Engine Propulsion Performance(MATLAB, EXCEL)

- Examined the ramjet performance across a range of key parameters, i.e., flight altitude, Mach number, etc.
- Optimized TSFC(thrust specific fuel consumption) and overall efficiency for a broad range of flight conditions

### Multivariable Design Optimization of NREL 5 MW Wind Turbine (Qblade, MATLAB)

- A 5 MW NREL wind turbine was revamped to reduce the cut-in wind speed and maximize annual energy production
- The variables included farm layout, airfoil type, blade geometry, pitch angle, blade number, and blade length

## WORKSHOPS & CONFERENCES

- Authored and presented a conference paper titled “Low Temperature Soot Regime of Propane in a Micro Flow Reactor with Controlled Temperature Profile” in the 11<sup>th</sup> US National Combustion Meeting held from 24-27<sup>th</sup> March in Pasadena, California

## AWARDS AND RECOGNITIONS

- Won ASU “MORE” research fellowship and presented a poster at “Spring 2019 MORE Symposium”
- Won ASU GPSA's “Teaching Excellence Award” for AEE-362 High-Speed Aerodynamics course in Spring 2019