# Khadija Ouajjani, PhD, MSc, MEng

#### **PROFILE**

- More than 10 years of international experience in R&D and engineering solutions implementation within the private automotive and aeronautics industries
- Independent and collaborative research experience; adept at seeking and integrating feedback
- Skilled in working with diverse, geographically dispersed, and virtual teams across disciplines
- Expertise in bridging theory and application through complex system conceptualization, and leveraging various software, tools, and techniques for tailored solutions
- Working on FEA simulation for aircraft assessment, crash analysis and validation
- Currently at the nexus of investigating the use of machine learning to accelerate aircraft crashworthiness simulation and analysis
- Keen interest on quantum mechanics and novel methodologies in preparing and onboarding hard STEM students for R&D workplace

#### **EDUCATION**

## Wichita State University

Wichita, KS

Ph.D., Aerospace Engineering

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Fall 2018 - Fall 2024

- Advisor: Dr. James E. Steck and Dr. Gerardo Olivares
- Major in Solid Mechanics and Structures
- Minor in Aerodynamics and Fluid Mechanics | Quantum Mechanics
- Main Research: Leveraging Machine Learning in Porosity Prediction: A Case of Fused Deposition Modeling
- Additional Research: Innovative teaching methodologies for undergraduate STEM education to expedite and enhance job readiness in the aerospace industry

# M.S., Aerospace Engineering

Fall 2016 – Spring 2018

• Major: Solid Mechanics and Structures

- GPA: 3.9
- Main Research: A Numerical Representative Volume Element on the Mesoscale for Parts Manufactured Through Fused Deposition Modeling and Reinforced with Short Fibers.
- Publication:
  - o A Mesoscopic RVE for Parts Manufactured through Fused Deposition Modeling and Reinforced with Short Fibers
- Spring 2017: GTA to AE625 Finite Elements Structural Analysis
- Fall 2017- Spring 2018: GRA at the Material Research group at the AVET division of NIAR

### National High Institute of Electricity and Mechanics - ENSEM -

Casablanca, Morocco

MEng, Mechanical Engineering

Fall 2009 – Spring 2012

- Major: Solid and Structural Mechanics
- Fall 2010 Spring 2011 Tutor in mathematics and applied physics
- Technical writer for the Mechanical Design Forum and Grabcad websites
- Final Year Project: Development of a crimping machine to press-fit two nozzles into an oil junction box, from customer needs assessment and conceptual design (mechanical, hydraulic and electrical systems) to manufacturing proof of concept and troubleshooting

# **Moulay Driss Preparatory Classes for Engineering Schools**

Fez, Morocco

Certificate, Intensive Undergraduate Preparatory Program

Fall 2007 – Spring 2009

- Major: Theoretical mathematics | Theoretical physics
- Completed a rigorous two-year program ("Classes Préparatoires aux Grandes Écoles") focused on advanced mathematics, physics, and engineering sciences to prepare for competitive engineering school entrance exams in France.

#### PROFESSIONAL EXPERIENCE

#### Jerry Moran Center of Advanced Virtual Engineering and Testing

Wichita, KS, USA

Postdoctoral Scientist PhD Researcher Graduate Research Assistant December 2024 – Ongoing August 2018 – December 2024 September 2017 – May 2018

- Conduct fundamental research hand in hand with applied practices for crash analysis and simulation.
- Investigate scientific findings, latest scientific trends and new simulation and analysis ideas to improve the efficiency and accuracy of crash simulations.
- Collaborate with the structural simulation teams to improve their simulation and modeling capacities.
- Coordinate with the manufacturing teams and workshop staff to create adequate testing environments and manage proper specimen extraction.
- Collaborate with teams to assess reports and decisions regarding modeling, simulation scenarios to be explored and testing to be conducted
- Develop numerical material cards tailored for specific crash simulations and FEA study cases.
- Extract properties, trends and prospective investigation paths from raw material testing data.
- Oversee data analysis and modeling techniques, to ensure alignment with project goals and guiding decisions on the next step.
- Create documentation to ensure knowledge is properly shared and disseminated, in compliance with applicable standards of security and industry.

### Safran Group, Jet Engines Department

Casablanca, Morocco

Aeronautics Design and Analysis Engineer

February 2014 – July 2016

- Conduct Finite Elements Analysis studies (Static, Dynamic, Crash, Impact, Noise and Vibration, Failure, Overspeed) on components of Safran jet engines
- Conduct crack propagation and lifecycle analysis for Safran jet blades
- Inform decisions on parts recall, and strategies for palliative maintenance, parts refurbishing and/or termination strategies
- Tailor analytical assessment and numerical simulations of aero structures and components depending on objectives and desired data to extract.
- Analyze non-conformities on manufactured parts with derogations.
- Migrate digital models of Safran jet engines from Patran/Nastran/Samcef to Ansys
- Develop and present Safran jet engine components certification reports and presentations in three different languages.
- Coordinate simulation analysis and R&D activities with multidisciplinary, polyglot, geographically dispersed teams.
- Train interns and new recruits on technical practices, reporting and archiving standards.
- Travel to France and Germany to gain expertise, put it to practice and to train colleagues at HO.

# NTS Maghreb, HONDA and Dassault Systèmes Division

Rabat, Morocco

Mechanical Design Engineer

March 2013 - January 2014

- Model different automotive components for crash analysis and Noise&Vibration tests
- Follow Japanese, French, Italian and Canadian clients' best practices, and provide avenues for improvement and automation.
- Implement digital project management through PLM technologies of Dassault Systèmes
- Support the launch of the Moroccan division of the NTS team, and train new recruits.
- Create tutorials and provide training and support on CATIA and ANSA.
- Travel to Canada to gain expertise, put it to practice and lead projects at HQ.

## Aditya Auto Products&Engineering

Bangalore, India

Project Engineer Trainee

July 2012 – February 2013

- Assist the project manager in the design, production and quality check processes of door latches.
- Design basic mechanical systems to check the conformity of door latches parts.
- Design a new door latch opening system and managed the production and trials of the prototypes.
- Design 2D draft plans for customers.
- Work with the quality department to create an archive for their gearboxes draft plans.

#### Internships

**ARCAD Technologie** 

Design Engineering Intern

Tangier, Morocco Spring 2012

**ARCAD Technologie** 

Design Engineering Intern

Tangier, Morocco Summer 2011

**RENAULT - SOMACA** 

Engineering Intern

Casablanca, Morocco Summer 2010

## RELEVANT JOURNAL PUBLICATIONS AND CONFERENCES

- In progress: "Leveraging Machine Learning for Porosity Prediction in AM using FDM for Pretrained Models and Process Development".
- 2022: "A Mesoscopic RVE for Parts Manufactured through Fused Deposition Modeling and Reinforced with Short Fibers", open access on Research Gate, presented at the 10<sup>th</sup> Edition of the Multiscale Materials Modeling conference, Baltimore 2022.

#### **GRANTS**

2018 – 2024, Graduate Research Assistantship: Jerry Moran Center of Advanced Virtual and Engineering Testing, Wichita

2022, Research Fellowship Student Travel: Graduate School, Wichita State University

2021, International Student Scholarship: Students Association, Wichita State University

2016 – 2018, Visiting Scholar: Fulbright program

#### PROFESSIONAL SKILLS

- CAD/FEA packages: CATIA V5, ANSYS, ANSA, ABAQUS, COMSOL, Primer, Patran, Nastran, Matlab
- Solver: Samcef, LS-DYNA, Abaqus, Nastran
- Programming: Matlab, Conda, pip, VS Code, Spyder, Git + Github, GPU's, Python (Pandas, NumPy, Tensorflow, Keras, CV, SQLAlchemy)
- Quantum programming: Qubit algorithms, IBM quantum gate computer, Topological quantum computer by Microsoft
- Experience with AI research, theory, and innovation
- Certification from the Coding School Qubit by Qubit for quantum computing, 2020-2021
- Certification of ESL, full accreditation as of 2024
- Dassault Systèmes PLM Enovia certification, 2013
- Native Arabic
- Fluent in French and English.
- Advanced level in German. (B2 level)
- Intermediate level in Spanish
- Elementary Japanese

### **SOCIAL COMMITMENTS**

- IRC volunteer, ESL instructor, Housing Set Up lead, family mentor and facilitator: 2019 ongoing
- Wichita Family Crisis Center: Survivor advocate, Volunteer: 2019 ongoing
- Beauties & Beasts Rescue: Volunteer: 2021 ongoing
- BBBS: Big sister: 2020 2022
- Fulbrighter Network coordinator: 2018 ongoing
- Fulbridge regional representative: 2019 ongoing
- Kansas Humane Society: Foster and volunteer: 2017 2018