



Omar Elnaggar

Researcher · Engineer · Entrepreneur

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SUMMARY

A doctoral researcher with an avid interest in human motion analysis and artificial intelligence, and pursuing a personal passion for teaching and learning. Aspired to a career where research and teaching meet at one sweet spot, and would be best if given an opportunity to demonstrate my growing management and entrepreneurial skills.

EDUCATION

- | | |
|---|--------------|
| Doctor of Philosophy in Mechanical, Materials and Aerospace Engineering | 2019-present |
| UNIVERSITY OF LIVERPOOL | |
| <ul style="list-style-type: none">• Thesis title: WEARABLE SENSING FOR NON-INVASIVE HUMAN POSE CLASSIFICATION DURING SLEEP• In collaboration with an orthopaedic consultant at Aintree University Hospital, Liverpool, United Kingdom. | |
| Master of Engineering in Mechatronic Engineering | 2015-2019 |
| UNIVERSITY OF NOTTINGHAM | |
| <ul style="list-style-type: none">• Best student award - rank 1/80• First Class with Honours | |
| International Baccalaureate Diploma | 2013-2015 |
| AL-WAKRA INDEPENDENT SECONDARY SCHOOL FOR BOYS | |
| <ul style="list-style-type: none">• Ranked among the top 2% worldwide | |
| Qatari High School Certificate | 2013-2015 |
| AL-WAKRA INDEPENDENT SECONDARY SCHOOL FOR BOYS | |
| <ul style="list-style-type: none">• Overall mark: 97% | |

AWARDS AND ACHIEVEMENTS

- | | |
|--|-----------|
| EPSRC Funded PhD Studentship | 2019 |
| University of Liverpool Doctoral Network in AI for Future Digital Health | |
| Best Engineering Student Award | 2019 |
| IEEE Electronics Packaging Society Malaysia Chapter | |
| Best Engineering Undergraduate Final Year Project - Finalist | 2019 |
| The Institution of Engineering and Technology (UK) and The Institution of Engineering (Malaysia) | |
| Best Student in MEng in Mechatronic Engineering (Year 3) Award | 2017-2018 |
| The University of Nottingham | |
| Greenbulb Energy Prize for Outstanding Performance: Control Systems Design | 2017-2018 |
| The University of Nottingham and Greenbulb Energy Pte. Ltd. | |
| Dean's Excellence Scholarship Award | 2017-2018 |
| The University of Nottingham | |
| Department Undergraduate Development Scheme | 2018 |
| The University of Nottingham | |
| Certificate of Recognition: Mechatronic Engineering Course Representative | 2018 |
| The University of Nottingham | |
| Certificate of Recognition: Mechatronic Engineering Course Representative | 2019 |
| The University of Nottingham | |
| Department Undergraduate Development Scheme | 2016 |
| The University of Nottingham | |
| Freescale Cup Intelligent Car Competition - Finalist | 2016 |

NXP Semiconductors

High Achievers Scholarship Award

2015-2016

The University of Nottingham

Government Excellence Sponsorship

2013-2015

Ministry of Education and Higher Education Qatar

Certificate of Excellence

2014

Al-Wakra Independent Secondary School for Boys

French Language DELF A1 Proficiency Exam - Top Scorers Award

2014

The French Council (Qatar)

Certificate of Excellence

2013

Al-Wakra Independent Secondary School for Boys

PUBLICATIONS

O. Elnaggar, and R. Arelhi, *Quantification of Knowledge Exchange Within Classrooms: An AI-based Approach*, 9th European Conference on Education, United Kingdom, 2021.

O. Elnaggar, F. Coenen, A. Hopkinson, and P. Paoletti, *Perception of Sleeping Poses Using Extremity Limb Orientations*, BioMedEng18 Conference Proceedings, United Kingdom, 2021.

O. Elnaggar, F. Coenen, and P. Paoletti, *In-Bed Human Pose Classification Using Sparse Inertial Signals*, 40th International Conference on Innovative Techniques and Applications of Artificial Intelligence, Springer, Cham, 2020.

O. Elnaggar, F. Coenen, and P. Paoletti, *Wearable Sensing For Non-invasive Human Pose Recognition During Sleep*, AI for Future Digital Health Workshop, SGAI 40th International Conference on Artificial Intelligence, 2020.

O. Elnaggar, and R. Arelhi, *A New Unsupervised Short-Utterance based Speaker Identification Approach with Parametric t-SNE Dimensionality Reduction*, International Conference on Artificial Intelligence in Information and Communication (ICAIIIC), Japan, 2019.

O. Elnaggar, and R. Arelhi, *An Unsupervised Speaker Identification Approach: A Breakthrough 3D Visualization of High Dimensional Features*, 21st International Conference on Artificial Intelligence and Pattern Recognition (ICAIPR), Singapore, 2019.

EMPLOYMENT HISTORY

The University of Liverpool

09/2020 - 08/2021 | England

Graduate Teaching Assistant

- Taught undergraduate students on three programmes: mechanical, aerospace and civil engineering.
- Delivered both face-to-face and online teaching sessions.
- Demonstrated a practical-intensive engineering module (38 lab sessions a year).
- Marked student' work using published assessment criteria and provided them with feedback on their progress.

Contact: Dr. Riaz Akhtar - R.Akhtar@liverpool.ac.uk

Intel

06/2017 - 09/2017 | Malaysia

Static Timing Analyst (Intern)

- Performed full chip timing execution tasks.
- Debugged several issues in the result and flow.
- Developed scripts to automate many of the computationally intensive tasks.

Contact: Mr. Ashish Goel - ashish.kumar.goel@intel.com

Motorola Solutions & The University of Nottingham

06/2016 - 08/2016 | Malaysia

Control Systems Engineer (Trainee)

- Designed and produced a fully functional Anti-lock Braking System (ABS) for automobiles.
- Tested the system in various real driving scenarios.

Contact: Dr. Kevin Lee - Kevin.Lee@nottingham.edu.my

TECHNICAL SKILLS

ARTIFICIAL INTELLIGENCE	Data Augmentation Data Analytics Natural Language Processing Deep Learning
PROGRAMMING	C/C++/C# MATLAB & SIMULINK Python TensorFlow & PyTorch HTML & CSS
EMBEDDED SYSTEMS	Wearable Sensors (Mixed-signal) PCB Design Sensor Fusion Algorithms
SOFTWARE DEVELOPMENT	UI/UX Design Sequential/Parallel Processing Web Development
COMPUTER SKILLS	Windows & Unix OS 2D/3D CAD Game Development (3D modelling & animation)
AUTOMATION & MANUFACTURING	Programmable Logic Controllers Subtractive & Additive Manufacturing Processes

HIGHLIGHTED PROJECTS

Design and Evaluation of Knowledge Exchange in Undergraduate Classrooms

2020-2021

UNIVERSITY OF SHEFFIELD & UNIVERSITY OF LIVERPOOL

- Designed a framework for a group assignment for an engineering module, cultivating knowledge exchange.
- Produced AI-based visualisations of students' knowledge before and after taking the group coursework.
- Recommended evidence-based approaches to foster knowledge exchange in classrooms.

Wearable Sensing for Non-invasive Human Pose Classification During Sleep

2019-present

UNIVERSITY OF LIVERPOOL

- Formulated the clinical problem in collaboration with an orthopaedic consultant at Aintree University Hospital.
- Conducted virtual sleep experiments leveraging on digital 3D animation software.
- Proposed novel algorithms for human body pose tracking during sleep.
- Developed custom-made wearable sensors for in-bed human motion analysis.
- Invited human participants to clinical trials for validating the proposed algorithms.

Volitional Control of Upper Limb Prosthesis for Rehabilitation Services

2018-2019

UNIVERSITY OF NOTTINGHAM

- Developed a musculoskeletal model of the human upper limb and simulated it under dynamic movements.
- Additively manufactured a controllable biomimetic prosthetic limb.
- Applied machine learning for the decoding of non-invasive EMG signals to recognise prosthetic movements.
- Implemented a closed-loop feedback control system to regulate the prosthetic movements.

Multi-modal Biometric System for Authentication Using Dimensionality Reduction

2017-2018

UNIVERSITY OF NOTTINGHAM

- Developed a hybrid identity authentication system using voice and iris signatures.
- Proposed a novel short-utterance speaker identification algorithm using parametric dimensionality reduction.

LANGUAGES

Arabic	English	French
Native Proficiency	Full Working Proficiency	Basic

INVITED TALKS

Guest Speaker: Engineering Employability Week

03/2021

University of Liverpool

- Spoke about my experience as a PhD student and the post-PhD career pathways.

Guest Lecture: Stochastic Processes

12/2020

University of Sheffield

- Presented on the probability theory behind stochastic processes.

Guest Speaker: Final Year Project Sharing

11/2018

University of Nottingham

- Gave an eye-opening talk to undergraduate engineering students on the applications of AI in signal processing.
- Shared tips on how to ace the final year project.

EXTRA-CURRICULAR ACTIVITIES

University-wide Green Initiative

2021-present

UNIVERSITY OF LIVERPOOL

- Designed, built and installed vertical hydroponic systems around the campus to push the sustainability agenda.

Specialised Virtual Engineering Labs

2020-present

UNIVERSITY COLLEGE LONDON & UNIVERSITY OF LIVERPOOL

- Took the initiative to address the lack of well-established digital platforms for engineering practicals.
- Formed a team of developers with expertise in immersive digital environments.
- Capitalised on game development and gamification to create virtual labs for a better learning experience.
- Received positive feedback from academics at The University of Nottingham and The University of Sheffield.

Entrepreneurship Course: Build your own business 3

07/2021 - 08/2021

UNIVERSITY COLLEGE LONDON

- Realised the process of launching a business through interactive workshops and one-to-one mentoring support.
- Grasped the different aspects of Intellectual Property, legal matters and startup financing.

Entrepreneurship Course: Build your own business 2

05/2021 - 06/2021

UNIVERSITY COLLEGE LONDON

- Recognised the tools needed to test the viability of a business idea and develop a business plan.
- Learnt the principles of identifying potential markets and target customer segments.

Self-learning: System Identification and Parameter Estimation

2018

DELFT UNIVERSITY OF TECHNOLOGY

Self-learning: Bio Mechatronics

2018

DELFT UNIVERSITY OF TECHNOLOGY

Intern Training Course Package

2017

INTEL

- Privacy Essentials.
- Data Leaks Avoidance.
- Information Security Awareness.
- Export Compliance Written Assurance.

edX Course: Introduction to C++

2016

MICROSOFT CORPORATION

CS4 Qatar for Robotics

2015

CARNEGIE MELLON UNIVERSITY

First Aid Training

2015

QATAR CENTRE FOR VOLUNTARY ACTIVITIES

Debate Course

2014

GEORGETOWN UNIVERSITY

Organising Committee Member for the Following Events:

ROBOTICS SOCIETY, THE UNIVERSITY OF NOTTINGHAM

- Arduino workshops for undergraduate students, 2015

THE YOUTH COMPANY, QATAR

- "Run the World" Festival, 2014

MINISTRY OF CULTURE AND SPORTS, QATAR

- Qatar's Sports Day, 2014

AL-WAKRA INDEPENDENT SECONDARY SCHOOL FOR BOYS, QATAR

- UK Universities Exhibition, 2014

QATAR CENTRE FOR VOLUNTARY ACTIVITIES

- Volunteer's International Day, 2014

Participant in the Following Activities:

INTEL

- Intel Cycling Ride (Silver Medal), *2017*

THE UNIVERSITY OF NOTTINGHAM

- Life Cycle Malaysia 3 (20-Km Charity Ride), *2016*

QATAR FOUNDATION & THE THIMUN FOUNDATION

- Model United Nations (THIMUN), *2015*

AL-WAKRA INDEPENDENT SECONDARY SCHOOL FOR BOYS, QATAR

- School's Scout Team (camping, desert greening, etc.), *2013-2015*

QATAR KARATE FEDERATION

- Qatar's Karate Cup (Silver Medal), *2013*

REFERENCES

Dr Paolo Paoletti

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Prof Frans Coenen

Professor

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University Teacher

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Faculty of Engineering

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Prof Haider Abbas Almurib

Professor

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Faculty of Science and Engineering

The University of Nottingham

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Selangor 43500

Malaysia

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Dr Stewart McWilliam

Associate Professor and Faculty Director of Student Journey

Department of Mechanical, Materials and Manufacturing

Faculty of Engineering

The University of Nottingham

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