

# Alain-Khaled CHAABAN, PhD, Eng

System Engineering | Optimization | AI | IoT | Robotics | Data Science  
| Smart Cities

Expert in system engineering and integration, research and development, academic activities management and teaching.

✉ chaaban.khaled@gmail.com

☎ (+966) 54-0946629

🌐 [linkedin.com/in/khaled-chaaban](https://www.linkedin.com/in/khaled-chaaban)

📍 Jeddah, Saudi Arabia

## Professional Summary

Motivating, talented and detail-oriented professional with a Ph.D. in Computer Engineering and over 18 years of experience in research, system engineering, and academic leadership. Specialized in the design, development, and optimization of real-time and embedded systems, with applications spanning robotics, intelligent transportation, and smart city technologies. Strong background in R&D, leading interdisciplinary projects at the intersection of academia and industry. Expert in applying engineering best practices and international standards to ensure high-performance, safety-critical systems. Actively engaged in mentoring graduate students, contributing to ABET accreditation, and driving curriculum innovation. Widely published and recognized for advancing solutions that support the development of resilient, intelligent, and sustainable urban systems.

## Skills & Expertise

### Technical Expertise

- Cloud Computing & Virtualization
- System Optimization
- System Engineering & Architecture
- Data Science & Machine Learning
- Software Engineering
- Robotics & Control Systems
- Embedded and Distributed Systems
- Big Data Analytics
- Smart Cities & Mobility Systems

## Programming & Tools

- Python, C/C++, PHP, JavaScript
- Unix/Linux, MicroC-OSII, OSEK
- dSPACE, Matlab/Simulink/RTW
- UML/SysML/MARTE
- SQL, MySQL, PostgreSQL
- Pandas, NumPy, SciPy
- Scikit-learn, TensorFlow
- Git, SVN, LaTeX
- AUTOSAR, ISO26262, DO178

## Professional Skills

- Academic Leadership
- Curriculum Development
- Research Development and Management
- Graduate Student Mentorship
- Technical Documentation
- Quality Assurance
- ABET and NCAAA Accreditation
- Industrial Collaboration
- Professional Training

## Professional Experience

### Associate Professor

2015 - Present

Umm Al-Qura University | Makkah, Saudi Arabia

- Led quality assurance initiatives for academic programs, ensuring compliance with accreditation standards (ABET and NCAA)
- Defined curriculum for M.Sc. program in computer engineering and networking
- Participated in designing and launching new bachelor's program in data science
- Developed courses in Object-Oriented programming, web development, robotics, operating systems, and distributed systems
- Secured funding for research project on Machine Learning for Multi-modal Transportation Systems optimization
- Taught courses for undergraduate and graduate students in Python, Java, Networks, Distributed Systems, Operating Systems, Databases, Applied statistics, ML, and full-stack web development

Python

C++

Smart cities

Machine Learning

Data Science

Robotics

Networks

Microcontrollers design

Operating Systems

### Associate Professor

2007 - 2015

## ESTACA Engineering School | Laval, France

- Chief manager of embedded systems team
- Delivered courses on real-time operating systems and model-based engineering
- Contributed to industrial projects including ELA (IRT-SystemX) and O4A-II (European project)
- Defined curriculum for new master's Program in embedded systems
- Taught several courses focused for graduate and undergraduate students primarily on real-time programming, software engineering, and embedded real-time systems.

Embedded Systems

Mobility systems

Real-time OS

Model-based Engineering

AUTOSAR

ISO26262

## Join Researcher

2013 - 2015

### IRT-SystemX | Paris, France

- The academic lead for the 'Multi-Core Embedded Systems' work package within the industrial ELA project (details: <http://www.irt-systemx.fr/project/ela/>).
- Prepared technical reports and project communications.
- Delivered technical training sessions to project members on automotive embedded systems.

Embedded Systems

Automotive Systems

Technical Training

## Part-time Lecturer

2011 - 2013

### Maine University | Laval, France

- Provided lectures on Android system development and Linux operating system.

Android

Linux

## Associate Researcher

2006 - 2007

### CNRS, Heudiasyc Lab | Compiègne, France

- Developed contextual scheduling techniques for online diagnostics at Renault Trucks
- Contributed to ANR and European R&D projects: Diafore, Safespot, and RoadSense
- Taught courses in C++, Java, VHDL/SystemC

C++

Java

VHDL

ADAS systems

SystemC

Distributed Systems

## Ph.D. in Information and Systems Technologies

2002 - 2006

### UTC/CNRS, Heudiasyc Lab | Compiègne, France

- Title: A Distributed Real-Time Architecture For Advanced Vehicles
- RoadSense project: An European project on ADAS prototyping
- Taught courses in C/C++, Real-time Operating Systems

## M.Sc. in Information and Systems Technologies

2001 - 2002

Université de Technologie de Compiègne (UTC) | Compiègne, France

- Title: Distributed real-time system for Multimedia applications

## Engineering Degree in Computer Systems and Telecommunications

1996 -  
2001

Faculty of Engineering, Lebanese University | Lebanon

## Key Projects

---

### Using ML to Learn an Optimization Process for Multi-modal Transportation Systems

2022 -  
2023

Umm Al-Qura University, Saudi Arabia

This research proposal aims to provide a generic framework focusing on multimodal transportation with the main goal of optimizing the mobility system management by combining machine learning models with the optimization methods.

- A generic and scalable framework allowing the integration of different mobility modes and optimization parameters
- Allowing competent authority to deploy the correct workforce planning and to employ the right resources depending on the periods and times
- Reducing the crowd in the main stations and enhances the mobility system usability
- Reducing the energy consumption and CO2 emission

### ELA: Electronic and Software for Autonomous Vehicles

2013 - 2016

IRT SystemX, Paris

The ELA project has been launched in July 2013 in order to provide operational solutions allowing one to respond to the new technological and economic challenges in the automotive industry, notably with regard to network-connected vehicles and driving assistance systems.

- The academic lead for the 'Multi-Core Embedded Systems' work package within the industrial ELA project (details: <http://www.irt-systemx.fr/project/ela/>).
- Prepared technical reports and project communications.
- Delivered technical training sessions to project members on automotive embedded systems.

### SAFESPOT: Cooperative vehicles and road infrastructure for road safety

2006 -  
2010

## European FP6 Funded Project

SAFESPOT is an integrated project co-funded by the European Commission Information Society Technologies under the 6th Framework Program. The project focuses on designing cooperative systems for road safety based on vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. It aims to prevent road accidents by developing a Safety Margin Assistant to detect potentially dangerous situations in advance and extend drivers' awareness of their surroundings in space and time, leveraging wireless communications. Additionally, the project involved studying the resilience of transportation networks against disruptions using complex systems approaches and network theory.

- Created a novel methodology for identifying critical infrastructure points in transportation networks
- Developed new methods of contextual scheduling for online diagnostic of distributed electronic functions at Renault trucks
- Published findings in international journals and conferences

## Scientific Responsibilities

- Team leader of embedded systems division at ESTACA engineering school
- Reviewer and Program Committee (PC) member of several IEEE/ACM international journals and conferences
- Member of CE program management committee
- PI and partner of several funded research and industrial projects
- Member of different scientific committees including French Society of Systems Engineering (AFIS) and INCOSE organization
- Supervision of several PhD and masters' projects

## Publications & Achievements

### Publications

- h-index: 10
- 35 international publications
- 2 book chapters
- 338 citations
- Featured publications:

A. K. Chaaban and N. Alfadl, "A comparative study of machine learning approaches for an accurate predictive modeling of solar energy generation", *Journal of Energy Reports*, 12:1293–1302, 2024 DOI: <https://doi.org/10.1016/j.egy.2024.07.010>

A. K. Chaaban. "A New Algorithm for Real-Time Scheduling and Resource Mapping for Robot Operating Systems (ROS)". *Journal of Applied Sciences*, 13(3), 1532, 2023 DOI <https://doi.org/10.3390/app13031532>

[View Google Scholar Profile →](#)

### Distinctions & Certifications

#### Awards

- First prize, E-Learning Competition at UQU University, 2020
- Best paper award, PECCS 2015 conference, France
- CNRS BDI scholarship for PhD studies (2002-2005)
- CNRS BDI scholarship for M.Sc. studies (2002-2002)

#### Recent Certifications

- Google Cloud Digital Leader Certification Bootcamp (2025)
- Machine Learning, Stanford University (2021)
- Accredited trainer on e-learning systems (2018)

© 2025 Alain Khaled CHAABAN. All rights reserved.

Last updated: 5/3/2025

## Alain-Khaled CHAABAN, PhD, Eng

System Engineering | Optimization | AI | IoT | Robotics | Data Science | Smart Cities

Expert in system engineering and integration, research and development, academic activities management and teaching.

✉ chaaban.khaled@gmail.com

☎ (+966) 54-0946629

🌐 linkedin.com/in/khaled-chaaban

📍 Jeddah, Saudi Arabia

## Professional Summary

Motivating, talented and detail-oriented professional with a Ph.D. in Computer Engineering and over 18 years of experience in research, system engineering, and academic leadership. Specialized in the design, development, and optimization of real-time and embedded systems, with applications spanning robotics, intelligent transportation, and smart city technologies. Strong background in R&D, leading interdisciplinary projects at the intersection of

academia and industry. Expert in applying engineering best practices and international standards to ensure high-performance, safety-critical systems. Actively engaged in mentoring graduate students, contributing to ABET accreditation, and driving curriculum innovation. Widely published and recognized for advancing solutions that support the development of resilient, intelligent, and sustainable urban systems.

## Skills & Expertise

---

### Technical Expertise

- Cloud Computing & Virtualization
- System Optimization
- System Engineering & Architecture
- Data Science & Machine Learning
- Software Engineering
- Robotics & Control Systems
- Embedded and Distributed Systems
- Big Data Analytics
- Smart Cities & Mobility Systems

### Programming & Tools

- Python, C/C++, PHP, JavaScript
- Unix/Linux, MicroC-OSII, OSEK
- dSPACE, Matlab/Simulink/RTW
- UML/SysML/MARTE
- SQL, MySQL, PostgreSQL
- Pandas, NumPy, SciPy
- Scikit-learn, TensorFlow
- Git, SVN, LaTeX
- AUTOSAR, ISO26262, DO178

### Professional Skills

- Academic Leadership

- Curriculum Development
- Research Development and Management
- Graduate Student Mentorship
- Technical Documentation
- Quality Assurance
- ABET and NCAAA Accreditation
- Industrial Collaboration
- Professional Training

## Professional Experience

---

### Associate Professor

2015 - Present

Umm Al-Qura University | Makkah, Saudi Arabia

- Led quality assurance initiatives for academic programs, ensuring compliance with accreditation standards (ABET and NCAA)
- Defined curriculum for M.Sc. program in computer engineering and networking
- Participated in designing and launching new bachelor's program in data science
- Developed courses in Object-Oriented programming, web development, robotics, operating systems, and distributed systems
- Secured funding for research project on Machine Learning for Multi-modal Transportation Systems optimization
- Taught courses for undergraduate and graduate students in Python, Java, Networks, Distributed Systems, Operating Systems, Databases, Applied statistics, ML, and full-stack web development

Python

C++

Smart cities

Machine Learning

Data Science

Robotics

Networks

Microcontrollers design

Operating Systems

### Associate Professor

2007 - 2015

ESTACA Engineering School | Laval, France

- Chief manager of embedded systems team
- Delivered courses on real-time operating systems and model-based engineering



- Contributed to industrial projects including ELA (IRT-SystemX) and O4A-II (European project)
- Defined curriculum for new master's Program in embedded systems
- Taught several courses focused for graduate and undergraduate students primarily on real-time programming, software engineering, and embedded real-time systems.

Embedded Systems

Mobility systems

Real-time OS

Model-based Engineering

AUTOSAR

ISO26262

## Join Researcher

2013 – 2015

IRT-SystemX | Paris, France

- The academic lead for the 'Multi-Core Embedded Systems' work package within the industrial ELA project (details: <http://www.irt-systemx.fr/project/ela/>).
- Prepared technical reports and project communications.
- Delivered technical training sessions to project members on automotive embedded systems.

Embedded Systems

Automotive Systems

Technical Training

## Part-time Lecturer

2011 – 2013

Maine University | Laval, France

- Provided lectures on Android system development and Linux operating system.

Android

Linux

## Associate Researcher

2006 – 2007

CNRS, Heudiasyc Lab | Compiègne, France

- Developed contextual scheduling techniques for online diagnostics at Renault Trucks
- Contributed to ANR and European R&D projects: Diafore, Safespot, and RoadSense
- Taught courses in C++, Java, VHDL/SystemC

C++

Java

VHDL

ADAS systems

SystemC

Distributed Systems

## Ph.D. in Information and Systems Technologies

2002 - 2006

UTC/CNRS, Heudiasyc Lab | Compiègne, France

- Title: A Distributed Real-Time Architecture For Advanced Vehicles
- Roadsense project: An European project on ADAS prototyping
- Taught courses in C/C++, Real-time Operating Systems

C/C++

Middleware

ADAS systems

Real-time scheduling

Distributed Systems

## M.Sc. in Information and Systems Technologies

2001 -

Université de Technologie de Compiègne (UTC) | Compiègne, France

- Title: Distributed real-time system for Multimedia applications

## Engineering Degree in Computer Systems and Telecommunications

1996 -

2001

Faculty of Engineering, Lebanese University | Lebanon

## Key Projects

---

### Using ML to Learn an Optimization Process for Multimodal Transportation Systems

2022 -

2023

Umm Al-Qura University, Saudi Arabia

This research proposal aims to provide a generic framework focusing on multimodal transportation with the main goal of optimizing the mobility system management by combining machine learning models with the optimization methods.

- A generic and scalable framework allowing the integration of different mobility modes and optimization parameters
- Allowing competent authority to deploy the correct workforce planning and to employ the right resources depending on the periods and times
- Reducing the crowd in the main stations and enhances the mobility system usability
- Reducing the energy consumption and CO2 emission

## **ELA: Electronic and Software for Autonomous Vehicles**

2013 -  
2016

IRT SystemX, Paris

The ELA project has been launched in July 2013 in order to provide operational solutions allowing one to respond to the new technological and economic challenges in the automotive industry, notably with regard to network-connected vehicles and driving assistance systems.

- The academic lead for the 'Multi-Core Embedded Systems' work package within the industrial ELA project (details: <http://www.irt-systemx.fr/project/ela/>).
- Prepared technical reports and project communications.
- Delivered technical training sessions to project members on automotive embedded systems.

## **SAFESPOT: Cooperative vehicles and road infrastructure for road safety**

2006 -  
2010

European FP6 Funded Project

SAFESPOT is an integrated project co-funded by the European Commission Information Society Technologies under the 6th Framework Program. The project focuses on designing cooperative systems for road safety based on vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. It aims to prevent road accidents by developing a Safety Margin Assistant to detect potentially dangerous situations in advance and extend drivers' awareness of their surroundings in space and time, leveraging wireless communications. Additionally, the project involved studying the resilience of transportation networks against disruptions using complex systems approaches and network theory.

- Created a novel methodology for identifying critical infrastructure points in transportation networks
- Developed new methods of contextual scheduling for online diagnostic of distributed electronic functions at Renault trucks
- Published findings in international journals and conferences

## **Scientific Responsibilities**

---

- Team leader of embedded systems division at ESTACA engineering school
- Reviewer and Program Committee (PC) member of several IEEE/ACM international journals and conferences
- Member of CE program management committee
- PI and partner of several funded research and industrial projects
- Member of different scientific committees including French Society of Systems Engineering (AFIS) and INCOSE organization
- Supervision of several PhD and masters' projects

## Publications & Achievements

---

### Publications

- h-index: 10
- 35 international publications
- 2 book chapters
- 338 citations
- Featured publications:

A. K. Chaaban and N. Alfadl, "A comparative study of machine learning approaches for an accurate predictive modeling of solar energy generation", *Journal of Energy Reports*, 12:1293–1302, 2024 DOI: <https://doi.org/10.1016/j.egyr.2024.07.010>

A. K. Chaaban. "A New Algorithm for Real-Time Scheduling and Resource Mapping for Robot Operating Systems (ROS). *Journal of Applied Sciences*, 13(3), 1532, 2023 DOI <https://doi.org/10.3390/app13031532>

[View Google Scholar Profile →](#)

### Distinctions & Certifications

#### Awards

- First prize, E-Learning Competition at UQU University, 2020
- Best paper award, PECCS 2015 conference, France
- CNRS BDI scholarship for PhD studies (2002-2005)
- CNRS BDI scholarship for M.Sc. studies (2002-2002)

### Recent Certifications

- Google Cloud Digital Leader Certification Bootcamp (2025)
- Machine Learning, Stanford University (2021)
- Accredited trainer on e-learning systems (2018)