

Baha'eddin M Alhaj Hasan

OBJECTIVE

To work as a Post-Doctoral Researcher / Research Engineer / University lecturer.

PERSONAL PROFILE

Proactive and creative researcher, with very good communication skills. Experienced in working independently or as a part of a team, leading others and accepting responsibility. Ability to meet deadlines and accurate recording and analysis. Teaching experience with B.Sc., master students, and Ph.D. students informal supervision.

I am interested in industrial automation, mechanical assembly, and mechatronics control systems. I seek a full-time academic or engineering position which will allow me to use and develop my existing teaching and technical skills and offer me professional growth and the possibility of advancement.

EDUCATION

2011– 2018 Royal Institute of Technology (KTH) University, School of Industrial Engineering and Management (ITM), Machine Design Department-Mechatronics Division.

PhD in Mechatronics

Thesis Title: An Ontological Approach to support Knowledge Sharing between Product Design and Assembly Process Planning (APP)

Supervisor: Professor Jan Wikander

2006-2008 Jordan University of Science and Technology, Engineering College, Mechanical Engineering Department.

Master in Mechatronics

Thesis Title: Fuzzy Control for High Precision Servomechanism: Hard Disk Driver (HDD) as an Example.

1995-2000 Royal Scientific society, Princess Sumaya University, Electronics Engineering Department.

Bachelor in Electronics Engineering

Thesis Title: Digital Controller for DC Motor Using FPGA

EMPLOYMENT

2020 - 2021 American International University (AIU) – Kuwait

Assistant Professor in Engineering College- Computer and Electrical Engineering Department.

Aiding in establishing computer and electrical engineering department in the AIU University. Also, establishing, developing, implementing, and instructing the following courses:

- **Design in Engineering:** This course is designed to provide students with an introduction to engineering design through engagement with a real-life design challenge, including the consideration of ethical, social, cultural, and environmental aspects. Students are taken through the various stages of the design process, underpinned by the learning of fundamental skills, such as Computer Aided Design (CAD), communication, and effective teamworking. Students will present their final design challenge solutions at the end of the course, which may include participation in a school showcase event.
- **Digital Logic Design:** This course is designed to provide students with an introduction to data representation in digital computers, Boolean algebra, logic gates, minimization and implementation of Boolean functions, arithmetic circuits, combinational circuits, sequential circuits: latches; flip-flops; counters, finite state machines, memories, and Verilog programming. Laboratory experiments provide hands-on experience using state-of-the-art FPGA setup to simulate, implement, and test combinational and sequential logic circuits.

2018 - 2020 Cleeven Sc Stockholm (Consulting Company)

Working as a consultant engineer at Scania AB. Participating in the following projects:

- **Digital Driver Display (DDW) project:** working as Hardware design (HW) engineer / Electronic Control Unit Design (EPCU) in the

DDW project. DDW project is mainly concerned about infotainment system in Scania trucks and buses new generations (2024). Infotainment systems include designing of automotive audio system (such as digital amplifiers, loudspeakers, and microphones), automotive visual systems (touch screens) and automotive communications system for audio and visual components such as automotive CAN systems, automotive Ethernet systems, Automotive Audio bus (A2B) systems and video and camera systems.

- Research and development engineer in powertrain of the electrified and hybrid vehicles project: development of the power converters used for the powertrain of the heavy duty electrified and hybrid vehicles.
- Autonomous vehicle driving project: Developing Lateral and Steering Control algorithms for Scania trucks by using Simulink®.

2011– 2018

Royal Institute of Technology (KTH) University, School of Industrial Engineering and Management (ITM), Machine Design Department-Mechatronics Division.

PhD Researcher & Lecturer

- Working as a researcher in the field of industrial automation. More specifically, working with:
 - ❖ Assembly robotic cells in manufacturing lines.
 - ❖ Product design specifications and extraction from the commercial CAD systems (such as SolidWorks, Catia, etc.).
 - ❖ Integrating product design and manufacturing /assembly domains by using IT tools, such as Protégé.
 - ❖ Control of modular robotics in manufacturing.
- Working as a lecturer, teaching courses for bachelor and master students.
- supervising bachelor and master students during thesis work.

2009-2011

Royal Institute of Technology (KTH) University, School of Information and Communication Technology (ICT), Electronics Department.

Research Engineer

Working as a researcher in the field of pervasive healthcare, more specifically, in developing biomedical sensors by deploying capacitive sensors in biomedical instruments that are in touch with the life of elderly people. The main aim of this project is to improve the quality of life of those elderly retired persons. The result of the project was a sensor mattress based on capacitive sensing technology to measure Bio-signals and other important measurements of the human body.

2000-2009

Hashemite University- Engineering College- Department of Electrical Engineering.

Lab supervisor & Teaching Assistant:

- Establishing, developing, implementing, and instructing the EE laboratory courses.
- Writing the EE lab manuals, and other teaching curriculum related to EE labs.

RESEARCH INTERESTS

My research interests include:

- Main research interest remains in the field of integrating product/ assembly design and manufacturing / assembly systems for robotic assembly units. My future research is to build on the foundations of my PhD, which includes the following aspects:
 - ❖ Heavyweight formal ontological modeling for manufacturing / assembly systems.
 - ❖ Feature-based semantic modeling & recognition for assembly design.
- Control of mechatronic systems:
 - ❖ Adaptive control for Servomechanism systems.
- Automotive electronic systems:
 - ❖ Designing of Electronic Control Units (ECU's) for different automotive project in truck / bus electrical / electronic systems.
 - ❖ Intelligent automotive control systems mainly concern about utilizing intelligent control in autonomous driving systems.

- Electronic and electrical systems:
 - ❖ Industrial & Biomedical instrumentation and measurement systems. ❖
 - Power Electronics Drivers.

TEACHING EXPERIENCE

My experience includes the following main parts:

- Teaching for the following courses during my work in KTH:
 - Bachelor Level:
 - ❖ Degree Project in Mechatronics: graduation project for Bachelor students.
 - Master Level:
 - ❖ Robust Mechatronics.
 - ❖ Mechatronics basic Course.
 - ❖ Motion Control.
 - ❖ Advanced Embedded Systems.
- Supervising many master students in thesis work during my work in KTH, this includes master theses in different topics (robotics, electrical and electronic design, sensing systems, electric machines, energy, and control).
- Lecturer and lab supervisor for different labs in electronics and electrical engineering department such as:
 - ❖ Measurement and Control Lab.
 - ❖ Computer Interfacing Lab.
 - ❖ Electrical Communication Lab.
 - ❖ Electrical Circuits I, II.
 - ❖ Electronics I, II.

❖ Electrical Communication

ADMINISTRATION

- Responsibility for organising academic seminars for master and bachelor students.
- Responsibility for organising non-academic activities for students.
- Experienced in report writing and writing up research proposals.
- experienced in equipping research and teaching laboratories with all the measuring instruments and machines that will be used to help achieve the required research and curriculums. this process includes assigning the required instruments and machines, putting down specifications and studying tenders, and answering the technical questions of suppliers.

SKILLS

Technical Skills

- Experienced in programming embedded systems by using C / C++ languages.
- Experienced in CAD knowledge recognition by using SolidWorks- API. Programming recognition algorithms by using Visual Basic for Application (VBA).
- Experienced in MATLAB and Simulink different toolboxes, such as: Simulink Control Design, Robotics System Toolbox, Fuzzy Logic Toolbox, Instrument Control Toolbox and Robust Control Toolbox.
- Experienced in ontological modelling by using OWL, CL and UML ontology languages.
- Experienced in electrical design by using AutoCAD and MagiCAD software's.
- Experienced in electronics design by using P-Spice software.
- Experienced in designing Printed Circuit Boards (PCB's) using Circuit CAM and Eagle File software's.
- Experienced in designing automotive ECU's with all different communication ports, such as CAN, LIN, Ethernet, GMSL and A2B.

Pedagogical & Communication skills

- Experienced in teaching courses and labs in mechatronics and electrical engineering, with professional teaching and supervision skills both for undergraduate and graduate students.
- Active member in learning group in KTH, during PhD I participated in the following pedagogical courses to develop and to enhance my skills as a teacher:
 - Basic Communication and Teaching.
 - Supervision and Assessment.
 - Learning for Sustainable Development.

- Doctoral Supervision.
 - Teaching and Learning in Higher Education.
- Experienced in working closely with research colleagues, department staff and external contacts.
 - Experienced in working with a wide range of students.
 - Experienced in preparing presentations to both academic and non-specialist audiences.

Publications

Product Feature Modelling for Integrating Product Design and Assembly Process Planning

Hasan, B., & Wikander, J. (2016). Product Feature Modelling for Integrating Product Design and Assembly Process Planning. *World Academy of Science, Engineering and Technology, International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, 10(10), 1693-1703.

Assembly Design Semantic Recognition Using SolidWorks-API

Hasan B., Wikander J. and Onori M. (2016). Assembly Design Semantic Recognition Using SolidWorks-API. In: *International Journal of Mechanical Engineering and Robotics Research*, Vol. 5, No. 4, pp. 280-287: 10.18178/ijmerr.5.4.280-287.

Ontological Approach to Integrate Design and Process Planning for an Assembly

Hasan B., Wikander J. and Onori M. (2016). Ontological Approach to Share Product Design Semantics for an Assembly. In *Proceedings of the 8th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management - Volume 2: KEOD, (IC3K 2016) ISBN 978-989-758-203-5, pages 104-111. DOI: 10.5220/0006051701040111.*

Features Extraction from CAD as A basis for Assembly Process Planning

Hasan B., Wikander J. (2017). Features Extraction from CAD as a Basis for Assembly Process Planning. In: Camarinha-Matos L., Parreira-Rocha M., Ramezani J. (eds) *Technological Innovation for Smart Systems. DoCEIS 2017. IFIP Advances in Information and Communication Technology*, vol 499. Springer, Cham.

An Ontological Approach for Knowledge Sharing between Product Design and Assembly Process Planning (APP)

Hasan B., Wikander J. and Onori M. (2017). An Ontological Approach for Knowledge Sharing between Product Design and Assembly Process Planning (APP). Under review: *Advanced Manufacturing Journal*- Springer

A Review on Utilizing Ontological Approaches in Integrating Assembly Design and

Assembly Process Planning (APP)

Hasan B., Wikander J. (2017). A Review on Utilizing Ontological Approaches in Integrating Assembly Design and Assembly Process Planning (APP). Submitted into International Journal of Mechanical Engineering (SSRG-IJME).

Assembly Features Utilization to Support Production System Adaptation

Hasan B., Onori M., Wikander J. (2014). Assembly Features Utilization to Support Production System Adaptation. In: Camarinha-Matos L.M., Barrento N.S., Mendonça R. (eds) Technological Innovation for Collective Awareness Systems. DoCEIS 2014. IFIP Advances in Information and Communication Technology, vol 423. Springer, Berlin, Heidelberg.

Utilizing Assembly Features for determination of Grasping Skill in Assembly System

Hasan B., Onori M., Wikander J. (2014). Utilizing Assembly Features for determination of Grasping Skill in Assembly System. In: The 14th Mechatronics Forum International Conference Karlstad, Sweden.

REFEREES

- Martin Edin Grimheden
Associate Professor, Head of Department

KTH, Machine design, Mechatronics Division Phone:
+46 8 790 77 97
E-mail: mjg@kth.se
Visiting address: Brinellvägen 83- Plan 4, KTH, Stockholm.
- Jan Wikander
Professor, Mechatronics, Dean of ITM School

KTH, Machine design, Mechatronics Division.
Phone: +468790 73 70
E-mail: jan@md.kth.se
Visiting address: Brinellvägen 83- Plan 4, KTH, Stockholm.
- Mousa Mohsen
Professor, Energy Systems, formal president of AIU University - Kuwait

American University of Ras Al Khaimah, Dean of School of Engineering
Phone: + 971 55 5554039
E-mail: mousa.mohsen@aurak.ac.ae

Visiting address: American University of Ras Al Khaimah Road, Ras Al Khaimah,
P.O. Box: 10021, AE