Hussein ALTARTOURI

Curriculum Vitae

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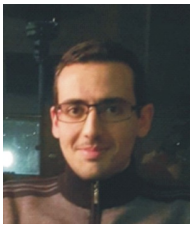
Jordanian/Palestinian, married, no children



Career Summery

Since June 2018, I work in the development department at Tremec (Zedelgem) as a responsible engineer of sensors and wiring harnesses on the being developed projects. Tremec is a well-respected brand in the automotive industry for their high-quality transmission systems. The company develops the transmission systems for high performance vehicles, rugged-duty agricultural, vocational and line haul vehicles. In parallel, I work at Experis Belgium as a project consultant for various mechatronics projects. Experis is a part of ManpowerGroup, a recognized pioneer engineering consultancy in the industry.

Prior to my PhD studies, I concluded my engineering studies in Mechatronics at Palestine Polytechnic University, ranked top of my class (GPA 92.4%). Then I stayed for two years in a Saudi university working on oil exploration-related project, in the framework of my master thesis in dynamics and control.

In 2014, I joined the Active Structures Laboratory (ASL) at Université Libre de Bruxelles as a PhD student. During the first year, I worked on the passive stability enhancement with sails of a flapping-wings micro air vehicle, I studied the vehicle dynamics and conducted some successful (stable) free flights. In which I had the opportunity to develop some hands-on skills in assembly and fabrication at micro scales, and the knowledge in dynamics of flying vehicles. After studying the vehicle stability, it was equipped with sails, then the parameters were identified experimentally. Herein I developed my knowledge in mechanical vibrations and aerodynamics.

In the second year I worked on designing a flapping mechanism in the size of hummingbird, which is responsible for generating the lift. Firstly, I studied the mechanism kinematics and its sensitivity to the manufacturing uncertainties. Afterwards I characterized various DC motors, wing shapes and batteries, in order to choose the most appropriate combination. Then, I designed the gearbox accordingly. While in the third year I focused on optimizing the mechanism weight and improving the lift production, the target was increasing the margin between the produced lift and the weight, to carry the necessary hardware for the controlled flight.

Overall, during the years I spent at ASL, I developed strong hands-on skills, by designing and performing several experiments related mostly to the flapping-wings micro air vehicles. Being involved in a multidisciplinary team of experts in mechanical engineering and physics was stimulating for reinforcing my background in several engineering disciplines such as aerodynamics, physics, active control of structures, transducers, computer interface and mechanical design.

Statement of Research Interests

My research interests go especially to areas related to mechanical engineering, applied mechatronics, design and control electromechanical systems. I am eager to discover new engineering problems and develop new skills in a research field different from what I studied previously. I aim at being involved in a multidisciplinary research where my experience and my skills in mechanical engineering and applied mechatronics can be complementary, and in which I will progress and develop new skills.

Positions

2018–present **Project Consultant**, *Experis, ManpowerGroup*, Brussels, Belgium.

2018–present **Development Engineer**, *Tremec, KUO Group*, Zedelgem, Belgium.

Academic Positions

2014–2018 **Full-time Researcher**, *Active Structures Laboratory, Department of Mechanical Engineering and Robotics, Université Libre de Bruxelles*, Brussels, Belgium.

2012–2014 **Research Assistant**, *Mechatronics Applications Center, Mechanical Engineering Department, King Saud University*, Riyadh, KSA.

2011–2012 **Teaching Assistant**, *Mechanical Engineering Department, Palestine Polytechnic University*, Hebron, WestBank, Palestine.

2010–2011 **Teaching Assistant**, *Mechatronics Engineering Department, An-Najah National University*, Nablus, WestBank, Palestine.

Education

2014–2018 **PhD., Doctor in Applied Sciences (Mechatronics)**, *Université Libre de Bruxelles*, Brussels, Belgium, Thesis: Design and control a tailless flapping-wings micro air vehicles.

2012–2014 **Master of Sciences in Dynamics and Control**, *King Saud University*, Riyadh, KSA, First of the Mechanical Engineering Department, GPA 4.84 / 5.00.

2005–2010 **Bachelor of Engineering in Mechatronics Engineering**, *Palestine Polytechnic University*, Hebron, WestBank, Palestine, ranked as the top student at the Engineering and Technology School, GPA: 92.4 %.
Thesis: Design and control a unicycle moving on a rough road, ranked as the best graduation project in the collage

Research Experience

2014–2018 **Active Structures Laboratory**, *Brussels*, Belgium.

My research was mainly focused on designing and controlling a tailless flapping-wings micro air vehicle, in which I worked on the following topics,

- **2014-2015: Passive stability enhancement with sails of flapping-wings micro air vehicles.** In the framework of developing the flying vehicle, I studied the vehicle dynamics based on a fairly simple model, some experiments were conducted to identify the model parameters, then the vehicle was equipped with sails act as aero-dampers to augment the stability. Afterwards, some free flights were carried out. The study was concluded and published.
- **2015-2016: Modelling, analysis and design the flapping mechanism.** Here I studied the mechanism kinematics and its sensitivity to the manufacturing uncertainties. The propulsion motor, the wing shapes and the on board-battery, all were characterized separately, then the gearbox was designed accordingly. The work was concluded and to be published.
- **2016-present: Optimizing the vehicle weight and improving the lift production.** In the framework of this, many structural materials were tested, different motor-battery combinations were checked, various wing designs were built and examined. The work motivation was increasing the margin between the produced lift and the weight, to carry the necessary hardware for the controlled flight. Although this work is in progress, but some parts were concluded and published.

2012–2014 **Mechatronics Applications Center**, *King Saud University*, Riyadh, KSA.

In the framework of my master thesis, I worked within an industrial group on developing a geophone sensor for topographic maps applications, my contribution centered on improving the quality of the measured signals. Different wiring configurations were tested and some postprocessing filters were implemented.

2009–2010 **Computer Aided Control Laboratory**, *Palestine Polytechnic University*, Hebron, WestBank, Palestine.

In the framework of my bachelor thesis, I worked on designing and controlling a unicycle capable of self-balancing. This system was basically developed for educational purpose, to be used inside the advanced control laboratory for illustration. The project started with mathematically modelling the unicycle system, after making reasonable assumptions Newton-Euler equations were derived then checked by Lagrange equations. Then a linear classical and state feedback control systems were designed and examined. Cost minimization functions (e.g. linear quadratic regulator) were employed then compared to the traditional method in state-feedback design. Furthermore, an extended observer, for the system states and disturbances, was designed based on the developed linear model, leading to better control performance. Extracting the attitude from the accelerator signals was a major difficulty in the project. Finally, the unicycle system was developed and tested, the work was concluded for further research, and the project was ranked as the top in the Engineering and Technology School at the university.

Teaching Experience

2014–2018 **Co-supervision of master theses**, *Université Libre de Bruxelles*, Brussels, Belgium.

I was a co-supervisor of master theses in the flapping-wings micro air vehicles field.

2011–2012 **Teaching Assistant**, *Palestine Polytechnic University*, Hebron, WestBank, Palestine.

I was responsible of bachelor theses in addition to the exercises lessons and the projects of the following courses:

- **Mechanical vibrations**
- **Control Systems**

2010–2011 **Teaching Assistant**, *An-Najah National University*, Nablus, WestBank, Palestine.

I was responsible of the exercises lessons and the projects of the following courses:

- **Mechanical vibrations**
- **Measurements and instrumentation**
- **Mechatronics**

Professional responsibilities

- **Manage tasks at ASL, proposing master projects and theses.**
- **Services to the community, university open days, reception school students in special events, ...etc.**
- **Reviewer for international journals.**

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Honours & Awards

2016 **Invited to visit *Berkeley Sensor & Actuator Center* (BSAC) at UC Berkeley for a long visit term (6-12 months.).** .

2014 **Erasmus Mundus scholarship (Phoenix project) in the framework of completion PhD. The scholarship includes a grant for three years and covers the participation costs.** .

2010 **Top of the Engineering and Technology School at Palestine Polytechnic University (2nd among 800 students), with GPA 92.4%.** .

Computer Skills

Informatics **MS Windows, MS Office, Latex, Coreldraw**.

Technical softwares **Matlab-Simulink, Catia, SolidEdge, Ansys, LabView, dSpace, C/C++, Pspice**.

Other **Computer Hardware and Support**.

Languages

Arabic **Mother tongue**

English **Professional proficiency**

Hebrew **Very good**

French **Beginner**

German **Beginner**

References

- **Prof. André Preumont**, Université Libre de Bruxelles.
  e-mail: andre.preumont@ulb.ac.be
- **Prof. Emanuele Garone**, Université Libre de Bruxelles.
  e-mail: emanuele.garone@ulb.ac.be
- **Prof. Karim Tahboub**, Palestine Polytechnic Univerity.
  e-mail: tahboub@ppu.edu
- **Prof. Mihaita Horodinca**, Gheorghe Asachi Technical University of Iasi.
  e-mail: horodinca@tuiasi.ro
- **Prof. Michel Kinnaert**, Université Libre de Bruxelles.
  e-mail: michel.kinnaert@ulb.ac.be

Publications

Journal and conference papers.

- H. Altartouri, E. Garone, A. Preumont, Gearbox design of a driving mechanism of a flapping twin-wing micro air vehicle. International Journal of Micro Air Vehicles (submitted, to be reviewed).
- H. Altartouri, A. Roshanbin, G. Andreolli, L. Fazzi, M. Karásek, M. Lalami, A. Preumont, Passive Stability Enhancement with Sails of a Hovering Flapping Twin-Wing Robot. International Journal of Micro Air Vehicles (accepted, to appear).
- A. Roshanbin, H. Altartouri, M. Karásek, A. Preumont, COLIBRI: A hovering flapping twin-wing robot. International Journal of Micro Air Vehicles, Volume: 9 issue: 4, page(s): 270-282.
- A. Roshanbin, H. Altartouri, A. Preumont, The COLIBRI Project - Subsystem Improvement. IEEE International Conference on Advanced Intelligent Mechatronics (AIM), Munich, Germany, July 3-7, 2017.
- H. Altartouri, A. Roshanbin, E. Garone, A. Preumont, Enhancing Stability of a Hovering Flapping Twin-Wing Robot. 36th Benelux Meeting on Systems and Control, Spa, Belgium, March 28-30, 2017.
- A. Roshanbin, H. Altartouri, E. Garone, A. Preumont, Velocity Estimation of a Flapping Wing Robot Based on Acceleration Measurement. 36th Benelux Meeting on Systems and Control, Spa, Belgium, March 28-30, 2017.
- Y. Nan, M. Karásek, M. Lalami, H. Altartouri, A. Preumont, An experimental study on effect of wing geometry of hummingbird like flapping wing in the hover. International micro air vehicles conference and flight competition (IMAV), Aachen, Germany, September 15-18, 2015.

Technical Training & Certification

- **Basics in Mechatronics and Programming of a Flexible Manufacturing Systems: a training course organized by Festo AG & Co. KG.**
- **Robotino: a training course organized by Festo AG & Co. KG.**
- **Installation and Programming of a Process Automation System: a training course organized by Festo AG & Co. KG.**
- **Quanser Lab Training (Quanser Certified Technical Support): a training course organized by Quanser, Inc.**
- **CNC with CATIA: a training course organized by Continuing Education Center of Palestine Polytechnic University.**
- **PLC and Industrial Sensors: a training course organized by Continuing Education Center of Palestine Polytechnic University.**

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