ChakhachiroTheodor

Contact

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Languages

Fluent in English, Arabic and French (Spoken and Written).

Computer Skills

OS: Microsoft, Linux Ubuntu(ROS Kinetic), Raspberry Pi
MS: Word, Excel, PowerPoint, Office
Languages: C++, Python(OpenCV-Pandas-Tensorflow), Matlab/Simulink, Arduino, LabVIEW, Mplab(Assembly-C)
Design: AutoCAD, PTC Creo, SolidWorks, Fusion 360, Ansys,EES
Others: Audacity, Photoshop,CES,Praat, Premier Pro

Soft Skills

Leadership, Communication, Team-Building, Organizational, Management, Public Speaking, Hardworking, Flexibility, Adaptability, Curious, Problem Solving, Ethical.

Career Objective

A passion driven engineer with deep knowledge and focus on the control and systems area as well as robotics and automation, mainly on the design of adaptive and robust controllers as well as Computer Vision and SLAM Mapping. My main objective is to deepen my knowledge in the area of control and robotics and utilize it for a better future.

To know more about my research as well as the major projects that I worked on, click here or visit https://theodorchakhachiro.netlify.app/

Experience

2017 - 2019 **Dar Al-Handasah Shair and Partners** Beirut, Lebanon
Trainee & Supervisor in the ME Dep.

- Design and management of control systems for multiple projects in Africa and the Middle East under the Control and Instrumentation unit of the Mechanical Engineering Department. Weekly updates and meeting presentations were held to update the client of the progress.
- Supervised various Electro-Mechanical Systems during the works involved in the Project DEPARTURE UPGRADE – STAGE 1 AT RAFIC HARIRI INTERNATIONAL AIRPORT that are not limited to the installation of the following: Operation and testing of the Baggage handling system, Escalators and Lifts, Plumbing and Drainage, Firefighting system, HVAC, Duct works, Building Management System and RFID systems.
- Supervised the installation and functioning of HVAC systems such as chillers, FAU and AHU at Beirut-Rafic Hariri International Airport.
- Supervised the process of mounting, unloading and operating gantry cranes, Ship-to-Shore cranes and Rubber Tyred cranes at the new Tripoli port.

Education

2020 - now **Teaching Assistant** Beirut, Lebanon
American University of Beirut

2019 - now **Research Assistant** Beirut, Lebanon
Vision and Robotics Lab, VRL
American University of Beirut

2016 - 2020 **Bachelor in Mechanical Engineering** Beirut, Lebanon
3.8 GPA in Mechanical Engineering, Dean's Honor List
4.0 GPA in the Control Systems and Robotics Track
American University of Beirut

2002 - 2016 **French and Lebanese Baccalaureate** Antoura, Lebanon
French and Lebanese Baccalaureate in Mathematics and General Science
Official in 2016, Mention Bien
College Saint Joseph Antoura

Papers and Publications

2020 **IROS 2021, 2^{nd} author** AUB VRL, Lebanon
Currently working on a paper to be submitted, co-authors are Rema Daher & Daniel Asmar.

2020 **IROS 2021, 2^{nd} author** AUB VRL, Lebanon
R. Daher, T. Chakhachiro , and D. Asmar, "A Comparative Assessment of Map Alignment Techniques"

Hobbies

As a person who really likes sports and wild adventures, my hobbies include playing football, basketball, table Tennis, tennis, swimming, bodybuilding, squash, karate and site searching/hiking.

Other projects

Convex Optimization for Wheeled Autonomous Mobile Robots Motion Planning Applications

Design and programming of an ultrasonic radar sensor using Arduino and LabVIEW

SmartPark system: automated parking via licence plate recognition, using computer vision and python.

Design and manufacturing of a small scale retractable roof using Plexiglas and shape memory alloys

Sumo robotics competition using MyDAQ and LabVIEW

PID controlled Inverted pendulum on a rack using Matlab and Simulink

Stress and Fatigue Analysis of a Super Mileage Car using Ansys Workbench after designing a complete gear mechanism for power transmission on Solidworks.

Major Projects

2019 - now **Final Year Project (In charge of the Mechanical Design & Mechatronics)** AUB, Lebanon
Automated UAV that plants seedlings in harsh environments and keeps track of their mortality along with other data in order to combat forest fires and other deforestation incidents. A report of the 9 months' work was written and presented in front of the Lebanese Reforestation Initiative LRI and a jury team composed of Electrical and Mechanical Professors at AUB. Now pursuing this project with LRI and AUB VRL.

2020 **FastSLAM Implementation** AUB, Lebanon
Coding and implementation of the FastSLAM and D* algorithms in a ROS environment using Turtlebot Waffle-pi and Husky robot. The coding was done using Matlab through the ROS toolbox. The simulation was carried out using Gazebo, installed on a Ubuntu 16.04 with the ROS Kinetic distribution.

2020 **System Identification of a Heat Exchanger (Team Leader)** AUB, Lebanon
Given a dataset obtained from an already running cross flow heat exchanger, performed a system identification study to optimize the control of the outlet temperature of the fluid through control of the input fluid velocity. The process is a liquid-saturated steam heat exchanger, where water is heated by pressurized saturated steam through a copper tube. The models used are not limited to the following: Box Jenkins, OE, ARX, ARMAX, NL Hammerstein-Wiener.

2019 - 2020 **Quanser Aero Platform (Team Leader & 1^{st} author)** AUB, Lebanon
Design of multiple controllers that provide good output tracking and model following with disturbance rejection. The designed controllers include an LQR, LQE, LQG, multiple SISO and MIMO adaptive controllers which include but are not limited to MRAC full state feedback, MRAC output feedback, ISTR with disturbance rejection, an adaptive controller based on the normalized MIT rule. A comparison of the results was assessed to determine the optimal controller and a paper titled "Control of a 2-DOF Helicopter" was submitted and presented.

2019 **Tele-operation system (Team Leader)** AUB, Lebanon
Design of a linear controller that offers good position tracking performance as well as an adequate transparency ratio for a novel pneumatic tele-operation system through a full-state feedback controller, an output feedback controller, a virtual sensing system, LQR, LQE, LQG, in addition to detailed system analysis. A presentation was also done for senior engineering undergraduates and masters students.

Extra Curricular Activities

2016 - now **Institute of Electrical and Electronics Engineers** Beirut, Lebanon
AUB active member

2016 - now **American Society of Mechanical Engineers** Beirut, Lebanon
AUB Substitute Cabinet member

2016 - now **Robotics Club** Beirut, Lebanon
AUB Substitute Cabinet member

2017 - 2018 **Physics Club** Beirut, Lebanon
AUB Active member

2019 **MIT Solveathon 2019** Beirut, Lebanon
Participant under the category "Community-Driven Innovations"
Team name: "From Down to Town" Developed an idea for an app to help improve the quality of government responses to society's need in terms of infrastructure, health and well-being.

2018 **IEEE Build It Weekend 3.0** Beirut, Lebanon
4th place: Design, manufacturing and programming of an LED piano teacher for dyslexic people using Arduino