# Mohammad Khalili | CV

#### Control Master's Student

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#### RESEARCH INTERESTS

- Legged Robots
- Locomotion Control

- Central Pattern Generators (CPGs)
- Rehabilitation Robotics

## **EDUCATION**

Master of Science

Aug, 2022 (Expected)

- Qazvin Islamic Azad University
  - Electrical Engineering (Major: Control)
  - GPA: 16.97/20 (5.09/6) up to now
  - Thesis Title: Quadruped Locomotion Control Using Central Pattern Generators Based on the Nonlinear Oscillators and CPG Parameters Tuning Using Reinforcement Learning and Iterative Learning Control
  - Supervisor: Prof. Mohammad Bagher Menhaj

Bachelor of Science

2016

- Qazvin Islamic Azad University
  - Electrical Engineering (Major: Control)
  - GPA: 15.99/20 (4.79/6) Last Two Years : 17.56/20 (5.26/6)
  - Thesis Title: Battery State of Charge Estimation Using By Coulomb Counting Method
  - Supervisor: Dr. Ahmad Fakharian

#### **HONORS**

o RoboCup IranOpen Competition — Demo League

2009 2016

- Ranked 6<sup>th</sup> Among 69 B.Sc. Graduated Students GPA 15.99/20
- Academic Scholarship For B.Sc. (Tuition Waived Due to Research Activities)
- Academic Scholarship For M.Sc. (Tuition Waived Due to Research Activities)

## RESEARCH EXPERIENCE

SYNTECH Technology and Innovation Center, Qazvin Islamic Azad University (QIAU)

Research Assistant at DowranSET Solar UAV Laboratory

2014-2017

- PID Controller Design and Parameters Tuning Using Intelligent Methods (MATLAB)
- Dynamic Equations Simulation of Multi-rotors (MATLAB)
- Position Error Correction Using Complementary Filter (MATLAB)
- Construction, Preparation and Testing of Multi-Rotors and UAVs
- Research Assistant at DowranSET Battery Laboratory

2017-2019

- Lithium-ion Battery Modeling and Simulation Using EEC Models (MATLAB)
- Lithium-ion Battery SOC Estimation Using Linear and Nonlinear Kalman Filters (MATLAB)
- Lithium-ion Battery SOH Algorithm Design for Lithium-ion Battery Pack (MATLAB)
- Analysis of Battery Pack Performance (MATLAB)
- Lithium-ion battery Pack Preparation and Test
- Research and Development on lithium-ion Battery Life Cycle prediction
- Design and Implementation of Lithium-Ion Battery Life Cycle Testing Procedure Using High-Tech Battery Instrumentation (MATLAB)
- Persian Gazelle IV. Solar Car Team, University of Tehran

2017

- o Current Measurement Board Design and SOC Estimation of Battery pack
- Extraction of Charge and Discharge Cycle and Linearization for Calibration in Lithium-ion Battery

## **WORK EXPERIENCE**

DowranSET knowledge-based Company, Qazvin Islamic Azad University(QIAU)

2018-present

- SLA Battery Modeling and Simulation Using EEC Models (MATLAB)
- SLA Battery SOC Estimation
- Design and Implementation of SLA Battery Life Cycle Testing Procedure Using High-Tech Battery Instrumentation (MATLAB)

## **PROJECTS**

- o Force Data Gathering Imported on The Human Body System
  - Embedded System Designing
  - Electrical System Designing
  - Importing Data to MATLAB via Wi-Fi Communication for the Purpose of Analyzing
  - Research and Develop
- Rescue Robot
  - Collecting Information by Camera and Sensors.
  - Manual Controlling Using Android Application
  - Transmitting Data via Wi-Fi.
- ARVIN Building Management System
  - Master Board PCB Designing (Altium Designer)
  - Raspberry Pi Setting up and Developing (Python)
  - Energy Management System Algorithm Developing (C/C++)
  - Embedded-Based Control System Designing and Implementing Along With an Android/IOS App to Monitor Ventilation, Lighting, Power and Security System
- EVs Battery Management System (BMS)
  - Research and Develop on SOC Estimation Methods
  - Lithium-ion Battery Modeling (MATLAB)
  - Lithium-ion Battery Test-bed Designing
  - Embedded System Developing for Current Measurement on ARM STM32 (C/C++)
- UPS Battery Monitoring System (BMS)
  - BMS Temperature Measurement Board Designing (Altium Designer)
  - SLA Battery Modeling (MATLAB)
  - Embedded System Developing for Battery Monitoring on ARM STM32 (C/C++)
  - Software and Hardware Test Procedures Designing and Results Documentation
- Y6 Multi Rotor
  - Flight Dynamics and Rotors Modeling
  - Position Error Correction Using Complementary Filter (MATLAB)
  - Fuzzy Logic PID Controller Designing and Modeling
  - Electrical Modules Assembling
- Motor Position Control
  - Hardware in the Loop PID Controller Design (MATLAB/Simulink)
  - Controller Parameters Optimization Using Intelligent Methods
  - Research and Develop on Advanced PID Controllers
- Dowran Solar UAV
  - UAV Flight Dynamics Researching and Modeling (MATLAB)
  - Solar Cell and Battery Pack Modeling (500 Wh)
  - Power Board Designing (100W Continuous Power)
  - Electrical Modules Assembling (Autopilot, Airspeed, Servos, Power Supply)

#### LANGUAGE SKILLS

- Persian Native
- English Fluent
  - IELTS Exam

Aug, 2022 (Expected)

# **COMPUTER SKILLS**

## **Programming**

- Python
  - NumPy
  - SciPy
  - Pandas
  - PyBullet
- MATLAB
- LMI Solvers
- Curve Fitting - Optimization
- Modeling
- o C/C++
- HTML5/CSS3

## **IDEs/Tools**

- VSCode
- PyCharm
- Codevision AVR
- IAR STM32 ARM
- STM CubeMX
- Git Version Control

#### **Simulation**

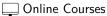
- MATLAB/Simulink
  - Control System Toolbox
  - Robotics System Toolbox
  - **ROS Toolbox**
  - Simscape
  - Simulink 3D Animation
- Webots
- ROS

#### **Electrical Softwares**

- Altium Designer
- Proteus

# **COURSES**

- Nonlinear Control
  - Instructor: Prof. Mohammad Javad Yazdanpanah
- Linear Matrix Inequalities (LMI)
  - Instructor: Dr. Ahmad Fakharian
- Adaptive Control
  - Instructor: Prof. Mohammad Bagher Menhaj
- Optimal Control
  - Instructor: Dr. Ahmad Fakharian



- The Complete Python 3 Course: Beginner to Advanced
- Introduction to Programming Using Python University of Texas at Arlington

Udemy

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# REFERENCES

#### Mohammad Bagher Menhaj

Professor, Department of Electrical Engineering

AmirKabir University of Technology, Tehran, Iran.

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