Seyed Sina Mirrazavi Salehian

Control and Machine Learning Expert

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Education

Ecole polytechnique fédérale de Lausanne

Lausanne, Switzerland

Phd in Robotics, Control, and Intelligent Systems

March. 2014 - PRESENT

- Thesis title: Coordinated multi-arm motion planning for reaching and grabbing moving objects

Amirkabir University of Technology

Tehran, Iran

MSc in Mechatronics, Robotics, and Automation Engineering

Sep. 2010 - Sep-2012

- Thesis title: Design and analysis of a nonlinear cooperative dual-master, dual-slave teleoperation system
- GPA: 18.68 out of 20

Amirkabir University of Technology

Tehran, Iran

BSc in Mechanical Engineering

Sep. 2006 - Sep-2010

- Thesis title: Reliability in Micro Electro Mechanical Systems (MEMS)
- GPA: 17.95 out of 20

Professional Experience

Doctoral Researcher at Learning Algorithm and System Laboratory

EPFL, Lausanne

Research on motion planning and controlling of uni- or multi- robotic arms.

March. 2014 - PRESENT

- Research:
  - Development of a real-time controller which endows a multi-arm system with both synchronous and asynchronous behaviors .
  - Development of a real-time solver for solving the inverse kinematic problem of multiple robotic arms with respect to the kinematic and the self-collision avoidance constraints.
  - Development of a real-time controller for catching flying objects softly .
- Projects:
  - Horizon 2020, Cogimon EU project.
  - The 7th Framework Programme, AlterEgo project.
- Live demos:
  - KUKA innovation award, Team manager, Hannover messa, MANCHU team, April 2017.
  - KUKA innovation award, Team manager, Hannover messa, CATCH team, April 2015.
- Other activities:
  - Development of a real-time control interface for KUKA IIWA.
  - Logistic G402 Proteus Speed Validation.
  - Speed Validation of the blackboards at EPFL.
  - Teaching activities in Robotic Practical, MSc course at EPFL.
  - Supervision of four internships, four master thesis and three semester student projects.

Internship at Learning Algorithm and System Laboratory

EPFL, Lausanne

Research on soft catching objects in flight.

Sep. 2013 - March. 2014

- Development of a real-time controller for catching softly objects in flight.

Hirgan energy engineering Co.

EPFL, Lausanne

Mechanical Rotating Equipments Engineer.

Sep. 2012 - Aug. 2013

- Being familiar with API 610.

Honors & Awards

April 2017 **Finalist**, KUKA innovation Award — *Hannover, Germany*

Jun 2016 **Received the Best Student Paper Award**, Robotics: Science and Systems Conference — *Ann Arbor, U.S.A*

Jun 2016 **Nominated for the Best Conference Paper Award**, Robotics: Science and Systems Conference — *Ann Arbor, U.S.A*

Jun 2016 **Nominated for the Best Systems Paper Award**, Robotics: Science and Systems Conference — *Ann Arbor, U.S.A*

April 2015 **Finalist**, KUKA innovation Award — *Hannover, Germany*

Sep. 2012 **Ranked 1st**, The master program in the mechanical engineering department — *Tehran, Iran*

Sep. 2010 **honorary Admission**, The master program in Amirkabir university — *Tehran, Iran*

Sep. 2010 **Ranked 5st**, The bachelor program in the mechanical engineering department *Tehran, Iran*

Sep. 2006 **Entrance Elite**, Amirkabir university of technology *Tehran, Iran*

Skills

Automatic Control and Optimization Theory

Expert with several years of experience primarily with applications in robotics

- Dynamical system based motion planning.
- Linear and Non-linear control algorithms (PID, feedback linearization, backstepping, adaptive, robust, etc).
- Optimal and model predictive Control.
- Data-Driven and Linear Parameter Varying Models.

Machine Learning

Expert knowledge with experience of a wide range of algorithms for regression, clustering and classification.

- Dimensionality reduction (PCA, Kernel PCA, LDA, etc).
- Linear and Non-linear regressions (GMR, GP, LWRP, LPV, SVR, etc).
- Linear and Non-linear clustering and classification (GMM, SVM, K-means, etc).
- Big-Data and Learning sparse Models.

Computer Skills

- C/C++, Python, Matlab Simulink, Maple, Java.
- Distributed version control systems: bzr, git, Travis.
- Robotic interfaces: ROS, YARP, Gazebo, Orocos, Usarsim.
- Machine learning interfaces: Mlpack(c++), Scikit-learn (Python), ML_toolbox (Matlab).
- Miscellaneous: LaTeX, UNIX/Linux, Windows, Adobe suite, Microsoft Office suite.

Robotic Platform

- Robotic manipulators: KUKA LWR 4+ and IIWA, ABB YU-Mi, KATANA.
- Humanoids: iCub.
- Haptic devises: Phantom omni and Falcon.
- Grippers and hands: Allegro hand, QB hand, 2-Finger Robotiq hand and Barret hand .
- Vision systems: Motive and Arena from Optitrack.

Language

- Farsi Native or bilingual proficiency.
- Azari Native or bilingual proficiency.
- English Fluent.
- French Elementary proficiency.

Academic Activities

Reviewer experiences

- IEEE Transactions on Aerospace and Electronic Systems.
- IEEE/RSJ International Conference on Intelligent Robots and Systems.
- IEEE International Conference on Robotics and Automation.
- IEEE-RAS International Conference on Humanoid Robots.
- IEEE/ASME International Conference on Advanced Intelligent Mechatronics.
- Journal of Mechanical Science and Technology.
- ASME's International Mechanical Engineering Congress and Exposition.

Selected publications

- Mirrazavi Salehian, S. S., Figueroa, N. and Billard, A. (2016) Coordinated multi-arm motion planning: Reaching for moving objects in the face of uncertainty. In Proceedings of Robotics: Science and Systems XVI , Arbor, Michigan, USA.
- Mirrazavi Salehian, S. S., Khoramshahi, M. and Billard, A. (2016) A Dynamical System Approach for Catching Softly a Flying Object: Theory and Experiment. in IEEE Transactions on Robotics, vol. 32, no. 2, pp. 462-471, April 2016.
- Firouzeh, A., Mirrazavi Salehian, S. S., Billard, A. and Paik, J. (2015) An Underactuated Robotic Arm with Adjustable Stiffness Shape Memory Polymer Joints. Proceedings of ICRA 2015.

Volunteer Experience and Hobbies

Treasurer at IRSA (Iranian Students Associations) *EPFL , Lausanne*

May. 2015 - May. 2016

Member at the student community of Mechanical Department *Amirkabir university, Tehran*

Jan. 2012 - Jan. 2013

Editor of the newspaper of the student community of Mechanical Department

Amirkabir university, Tehran

Jan. 2012 - Jan. 2013

Treasurer at the climbing community of Mechanical Department

Amirkabir university, Tehran

Jan. 2011 - Jan. 2012

Hobbies

- Volleyball, Biking, Hiking, Basketball