Haitham El-Hussieny

Lecturer of Robotics Engineering

Date of Birth: Sep. 7, 1984

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Interests

- Soft Robotics
- Intelligent Control
- Robotic Teleoperation
- Model Predictive Control
- Deep Learning in Robotics

Skills

Programming:

- ROS1/2, Moveit, Gazebo ●●●●●
- MATLAB, C++ ●●●●●
- Python3 ●●●●○
- Unity3D ●●●●○
- Bash scripting ●●●●○

Frameworks:

- OpenCV, PCL ●●●●○
- TensorFlow/Keras ●●●●●

CAD Tools:

- CATIA ●●●●●
- MSC ADAMS ●●●●●

Robot Simulators:

- V-REP, Webots ●●●●●
- SOFA Framework ●●●○○

Optimization Tools:

- CasADi ●●●●●

Work Experience

Aug, 2019 – ongoing
Senior Research Fellow in Soft Robotics — **University of Salford, UK**

- Carry out high quality scientific research.
- Design, implement, test and document appropriate robot designs and control systems.
- Liaise with other researchers, both internally and at partner institution, to achieve project deliverables.

Key achievement: Establishment of a link between the Robotic center at the University of Salford and the NHS Royal Salford Trust group to work on assistive robotic glove for patients with neurological motor diseases. One book chapter submitted (abstract accepted).

Sep, 2016 – ongoing
Assistant Professor (on leave since 08/2019) — **Benha Univ., Egypt**

- Teaching undergraduate and postgraduate courses.
- Supervision of graduation projects and master-level students.

Key achievement: Liaison with Coursera to facilitate the Coursera4Campus program for Benha University. (worked as a Coursera Program Administrator).

Sep, 2018 – Aug, 2019
Adjunct Assistant Professor — **E-JUST Univ., Egypt**

- Teaching a postgraduate course for one day per week.
- Co-supervision of master and doctoral students.

Key achievement: Co-supervising/advising of two PhD and one MSc students with two publications in IEEE Access and five conference papers.

May, 2017 – Jun, 2018
Postdoctoral Researcher — **KOREATECH Univ., S. Korea**

- Worked as a contributor in a collaboration project with CHARM Lab., Stanford University with title “Human-Centered Design and Control of Vine Robots for Disaster Scenarios".

Key achievement: Publication on Vine-robots in IEEE Robotics and Automation Magazine.

Oct, 2016 – Feb, 2017
Adjunct Assistant Professor — **Zewail City Univ., Egypt**

- Worked as a part-time Adjunct Assistant Professor at Aerospace Engineering Department for two days/week. Delivering an undergraduate course (SPC 318: System Modeling and Linear Systems).

Sep, 2015 – May, 2016
Visiting Researcher — **NAIST Univ., Japan**

- Conducted experiments with KUKA LWR iiwa R820 robot manipulator and doing research on eye-gaze input interface in HRI applications.

Jul, 2008 – Sep, 2011
Teaching Assistant — **Benha Univ., Egypt**

- Worked as a full-time Teaching Assistant at the Electrical Engineering Department, Faculty of Engineering (Shoubra), Benha University to help in teaching courses in electronics and robotics subjects.

Jul, 2008 – Sep, 2011
Embedded Systems Engineer — **Egytronix Co., Egypt**

- Worked as a part-time embedded systems engineer (four days/week) in the field of power electronics applications and embedded systems design.

Education

Postgraduate Studies

2013 – 2016 **Ph.D. in Mechatronics and Robotics Engineering** **E-JUST, Egypt**
Title: Development of a Cognitive Human-Robot Interaction System for Dexterous Teleoperation.
Supervisors: Prof. Said Megahed, Dr. Samy Assal, Prof. Ahmed A. Abouelsoud and Prof. Tsukasa Ogasawara.
Grade: CGPA: 3.78
HRI | Teleoperation | Shared Control | Eye Gaze

2011 – 2013 **M.Sc. in Mechatronics and Robotics Engineering** **E-JUST, Egypt**
Title: Improving Robots Exploration by Heuristic Backtracking in Sensor-based Techniques.
Supervisors: Dr. M. Abdellatif and Dr. Samy Assal
Grade: CGPA: 3.5
Mobile Robots | Exploration | Navigation | Path Planning

Undergraduate Study

2002 – 2007 **B.Sc. in Electronics and Communications Engineering** **Benha Univ., Egypt**
Project Title: A Motorized Wheelchair for Handicapped.
Supervisors: Dr. Asharaf Hafez
Grade: Very Good (Ranked 3rd. among 200 students)

Other Training

May 2005 **Embedded Systems Diploma** **Jelecom Co., Egypt**
Training on microcontrollers: 8051, AVR, PIC and Motorola.

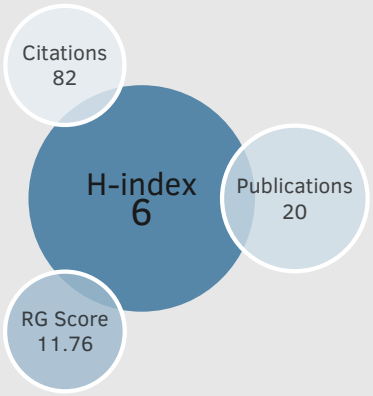
Certifications

August 2020	**Neural Networks and Deep Learning**	**Coursera**
July 2020	**AI for Medical Diagnosis**	**Coursera**
July 2020	**Introduction to Deep Learning with OpenCV**	**LinkedIn**
July 2020	**Named Entity Recognition using LSTMs with Keras**	**Coursera**
July 2020	**Python Essential Training**	**LinkedIn**
July 2020	**Sequences, Time Series and Prediction**	**Coursera**
July 2020	**Facial Expression Recognition with Keras**	**Coursera**
July 2020	**Writing to Be Heard**	**LinkedIn**
January 2020	**GDPR/ Information Security**	**Marshall E-Learning**
January 2020	**Managing Positive Mental Wellbeing**	**Marshall E-Learning**
January 2020	**Business Writing Principles**	**LinkedIn**

Short Bio

Haitham received his MSc and PhD degrees in Mechatronics and Robotics Engineering from Egypt-Japan University of Science and Technology (E-JUST) in 2013 and 2016, respectively. Since completing his PhD, Haitham has worked as an Assistant Professor of Robotics Engineering at the Faculty of Engineering at Benha University in Egypt. During 2017, he has held a post of a postdoctoral researcher at KOREATECH University in South Korea in collaboration with Stanford University. He was involved as a contributor to a joint US-Korea research project on Human-Centered Design and Control of Vine Robots for Disaster Scenarios. His research expertise includes soft robotics, soft haptics, teleoperation, human-robot interaction and applied deep learning approaches in robotics.

Metrics



Profiles

Languages

Arabic (Mother Tongue)

English (iBT:86, 2011)

Japanese (Intro. course, 2016)

Teaching Experience

Postgraduate Courses

The University of Salford, UK — **Artificial Intelligence, M2** — Spring'20
Fuzzy Logic, Deep Neural Networks, CNN, Genetic and PSO optimization.

E-JUST University, EG — **MTR 601: Intelligent Control Systems** — Fall'18, Spring'19
Fuzzy Logic Control, Neural Network Control, Evolutionary Algorithms and Genetic Programming.

Benha University, EG — **ECE 501: Advanced Embedded Systems** — Fall'16
Microcontrollers and Microprocessors Applications

Undergraduate Courses

Benha University, EG — **ECE 447: Robotics Engineering** — Spring'17, Spring'19
Robot Structure, Kinematics, Dynamics and Control.

ECE 101: Electronics (I) — Fall'16
Basic of Electronics: PN Junctions, Diode applications.

ECE 102: Electronics (II) — Spring'17
LEDs, Optocouplers, Photo-diodes and applications.

ECE 204: Electrical and Electronic Measurements — Fall'16, Fall'18
PMMC, AVO-meters, Digital Instruments, Sensor and actuators.

ZewailCity University, EG — **SPC 318: System Modeling and Linear Systems** — Fall'18
Transfer function, State-Space, First and Second Order Systems, Stability Analysis and Root Locus.

YouTube! — **Introduction to LaTeX in Arabic** — Since Dec 8, 2014

Academic Co-Supervision

2018–2020 — **Demonstration-Guided Motion Planning for Continuum Robots** — Ph.D.
E-JUST

2018–2020 — **Intelligent Control of Automotive Air-Spring Suspension System.** — Ph.D.
E-JUST

2019–2020 — **Autonomous Tasks-around-head Assistance for Elderly People.** — M.Sc.
E-JUST

Honors and Awards

May 2020 — Award of Research Excellence (15000 EGP) — Benha Univ., Egypt
May 2018 — Award of Research Excellence (10000 EGP) — Benha Univ., Egypt
Jan 2017 — Award of Research Excellence (4000 EGP) — Benha Univ., Egypt
Sep 2011 — Awarded M.Sc. and Ph.D. Scholarships — MoHE, Egypt

Invited Talks

Mar 2019 — **Entrepreneur Workshop** — E-JUST Univ.
Gave a two hours lecture on career support and entrepreneurship.

May 2009 — **Getting Started in Embedded Systems** — Benha Univ.
Gave a lecture on getting started in embedded systems.

Review Duties

Journals — IEEE TRO, Advanced Robotics, ISR, EEAI
Conferences — ICRA'17, IROS'18, ICRA'19, ICAR'19.

Publications (1/2)

Journals

- Ibrahim A. Seleem, **H. El-Hussieny**, Samy F. M. Assal and Hiroyuki Ishii, “Development and Stability Analysis of an Imitation Learning-based Pose Planning Approach for Multi-section Continuum Robot.", IEEE Access (2020).
- Ibrahim A. Seleem, Samy F. M. Assal, Hiroyuki Ishii and **H. El-Hussieny**, “Demonstration-Guided Pose Planning and Tracking for Multi-section Continuum Robots Considering Robot Dynamics.", IEEE Access (2019).
- Margaret M. Coad, Laura H. Blumenschein, Sadie Cutler, Javier A. R. Zepeda, Nicholas D. Naclerio, **H. El-Hussieny**, Usman Mehmood, Jee-Hwan Ryu, Elliot W. Hawkes, and Allison M. Okamura. “Vine Robots: Design, Teleoperation, and Deployment for Navigation and Exploration.", IEEE Robotics & Automation Magazine (2019).
- **H. El-Hussieny** and Jee-Hwan Ryu, “Inverse Discounted-based LQR Algorithm for Learning Human Movement Behaviors.”, Applied Intelligence, 2018, 49 (4), pp.1489-1501.
- **H. El-Hussieny**, Samy F. M. Assal and Jee-Hwan Ryu, “SoTCM: a scene-oriented task complexity metric for gaze-supported teleoperation tasks.” Intelligent Service Robotics, 11, 2018, pp.279-288.
- **H. El-Hussieny**, A.A. Abouelsoud, Samy F. M. Assal and Said M. Megahed, “Adaptive learning of human motor behaviors: An evolving inverse optimal control approach.” Engineering Applications of Artificial Intelligence, 50, 2016, pp.115-124.
- **H. El-Hussieny**, Samy F. M. Assal, and M. Abdellatif, “Robotic Exploration- New Heuristic Backtracking Algorithm, Performance Evaluation and Complexity Metric”, International Journal of Advanced Robotic Systems, 12, 2015, pp.33.

Conferences

- M. E. Shalabi, **H. El-Hussieny**, A. A. Abouelsoud, and Ahmed M. R. Fath Elbab, “ Control of Automotive Air-Spring Suspension System Using Z-Number Based Fuzzy System", in the International Conference on Robotics and Biomimetics, Automation and Robotics (ROBIO 2019), pp. 1306-1311, IEEE, 2019.
- Oladayo Solomon and **H. El-Hussieny**, “An ANFIS-based Human Activity Recognition using IMU sensor Fusion," in Proc. of IEEE Novel Intelligent and Leading Emerging Sciences Conference (NILE2019), Egypt, Vol. 1, pp. 34-37, IEEE, 2019.
- Oladayo Solomon, Samy F. M. Assal and **H. El-Hussieny**, "Towards Development of an Autonomous Robotic System for Beard Shaving Assistance for Disabled People," in Proc. of IEEE International Conference on Systems, Man, and Cybernetics (SMC), Bari, Italy, pp. 3435-3440. IEEE, 2019.
- **H. El-Hussieny**, Sang-Goo Jeong and Jee-Hwan Ryu, “Dynamic Modeling of A Class of Soft Growing Robots Using Euler-Lagrange Formalism" In 2019 SICE Annual Conference, Japan, pp. 453-458, IEEE (2019).

I cannot find this paper on IEEE, the paper was accepted as Poster or Workshop

- M. E. Shalabi, **H. El-Hussieny**, A. A. Abouelsoud, and Ahmed M. R. Fath Elbab, “Finite Control Augmented with Fuzzy Logic for Automotive Air-Spring Suspension System", in The 16th. International Conference of Informatics in Control, Automation and Robotics (ICINCO 2019) [Accepted].
- Mohamed G. B. Atia, Omar Salah, and **H. El-Hussieny**, “OGPR: An Obstacle-Guided Path Refinement Approach for Mobile Robot Path Planning." in Proc. of the 2018 IEEE International Conference on Robotics and Biomimetics (ROBIO), 2018, pp. 844-849
- **H. El-Hussieny**, U. Mehmood, Z. Mehdi, S-G. Jeong, M. Usman, E. W. Hawkes, A. M. Okamura, and J.-H. Ryu, “Development and evaluation of an intuitive flexible interface for teleoperating soft growing robots," in IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018, pp. 4995-5002.
- Ibrahim A. Seleem, **H. El-Hussieny** and Samy F. M. Assal, “Motion Planning for Continuum Robots: A Learning from Demonstration Approach," 2018 27th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), Nanjing, China, 2018, pp. 868-873.
- Ibrahim A. Seleem, **H. El-Hussieny** and Samy F. M. Assal, "Development of a Demonstration-Guided Motion Planning for Multi-section Continuum Robots," in Proc. of IEEE International Conference on Systems, Man, and Cybernetics (SMC), Miyazaki, Japan, 2018, pp. 333-338.
- **H. El-Hussieny**, A. Asker and O. Salah, “Learning the sit-to-stand human behavior: An inverse optimal control approach," 2017 13th. International Computer Engineering Conference (ICENCO), Cairo, Egypt, 2017, pp. 112-117.

Publications (2/2)

Conferences

- **H. El-Hussieny**, Samy F. M. Assal, A. A. Abouelsoud, Said M. Megahed, and T. Ogasawara, "Incremental Learning of Reach-to-Grasp Behavior: A PSO-based Inverse Optimal Control Approach," in Proc. of the 7th. Int. Conf. on Soft computing and pattern recognition, Fukuoka, Japan, pp. 129-135, Nov. 13-15, 2015.
- **H. El-Hussieny**, Samy F. M. Assal, A. A. Abouelsoud, and Said M. Megahed "A Novel Intention Prediction Strategy for a Shared Control Tele-manipulation System in Unknown Environments", in Proc. of the IEEE/IES Int. Conf. on Mechatronics (ICM 2015), Nagoya, Japan, pp. 204-209, 6-8 Mar. 2015.
- **H. El-Hussieny**, S. F. M. Assal, and M. Abdellatif, "Improved backtracking algorithm for efficient sensor-based random tree exploration," in Proc. of the 5th. Int. Conf. on Computational Intelligence, Communication Systems and Networks (CICSyN2013), pp 19-24, Madrid, Spain, 5-7 Jun. 2013.
- **H. El-Hussieny**, S. F. M. Assal, and M. Abdellatif, "Improved sensor-based mobile robot exploration of novel environments", in Proc. of the 6th. Int. Conf. on Intelligent Computing and Information Systems (ICICIS), 2013, pp. 43-49, Cairo, Egypt, 14-16 Dec. 2013.