



# Mohamed G. Alkalla

*Ph.D. Mechatronics & Robotics Engineering*

## PERSONAL INFORMATION

Position Research Associate/Lecturer/Assistant Professor  
Date of Birth 01 January 1986  
Nationality Egyptian  
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Address Ground floor flat, 56 Harvey Rd., Guildford, GU1 3LU, UK.  
Personal Profile <https://www.surrey.ac.uk/people/mohamed-alkalla>

## RESEARCH INTEREST

- Climbing, Mobile and Flying Robots.
- Advanced Robotic Applications and Industrial Robots.
- Drilling Systems for Extraterrestrial Surfaces.
- Mechanical Design.
- Structural Optimization.

## OCCUPATION

2018–Now **Research Associate**, *Surrey Space Centre*, University of Surrey, UK.  
2017–2018 **Lecturer (Assistant Professor)**, *Production Engineering and Mechanical Design Dept.*, Faculty of Engineering, Mansoura University, Egypt.  
2017–2018 **Adjunct Assistant Professor**, *Aerospace Engineering Department*, University of Science and Technology at Zewail City of Science and Technology, Egypt.  
Feb.–Nov. 2016 **Visiting Research Fellow**, *Prof. Shuji Hashimoto Lab, Physics and Applied Physics Dept.*, Waseda University, Tokyo, Japan.  
2014–2017 **Ph.D. Scholarship**, *Mechatronics and Robotics Engineering Dept.*, *Egypt-Japan University of Science and Technology (E-JUST)*, Alexandria, Egypt.  
(CGPA: 3.83)

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2013–2017 **Assistant Lecturer**, *Production Engineering and Mechanical Design Dept.*, Faculty of Engineering, Mansoura University, Egypt.

2007–2013 **Demonstrator**, *Production Engineering and Mechanical Design Dept.*, Faculty of Engineering, Mansoura University, Egypt.

## PUBLICATIONS

1. Fanni, M., Shabara, M., **Alkalla, M. G.**, "Topology optimization of High Speed Flexible Robot Arms", Mansoura Engineering Journal, MEJ, vol. 38, No. 1, March 2013.
2. Fanni, M., Shabara, M., **Alkalla, M. G.**, "A Comparison between Different topology optimization methods", Mansoura Engineering Journal, MEJ, vol. 38-Issue, December 2013.
3. **Mohamed G. Alkalla**, Mohamed A. Fanni, Abdel-Fatah Mohamed "Versatile Climbing Robot for Vessels Inspection" in proceeding: IEEE International Conference of Control, Automation and Robotics (ICCAR), pp: 18-23, Singapore, 2015.
4. **Mohamed G. Alkalla**, Mohamed A. Fanni, Abdel-Fatah Mohamed "A Novel Propeller-type Climbing Robot for Vessels Inspection" in proceeding: AIM2015, IEEE/ASME International Conference on Advanced Intelligent Mechatronic, pp: 1623-1628, Korea, 2015.
5. **M. G. Alkalla**, M. A. Fanni, A. M. Mohamed, and S. Hashimoto, "Teleoperated propeller-type climbing robot for inspection of petrochemical vessels" Industrial Robot: An International Journal, vol. 44, no. 2, pp. 166–177, 2017. [Online]. Available: <http://dx.doi.org/10.1108/IR-07-2016-0182>
6. Mohamed Fanni, **Mohamed G. Alkalla**, Abdelfatah M., "Propeller Type Skid Steering Climbing Robot Based on A Hybrid Actuation System" International Journal of Robotics and Automation, ACTA press, 33 (3), May 2018.
7. **Mohamed G. Alkalla**, Mohamed A. Fanni, Abdelfatah Mohamed, Shuji Hashimoto, Hideyuki Sawada, Takanobu Miwa & Amr Hamed (2019) EJBOT-II: an optimized skid-steering propeller-type climbing robot with transition mechanism, Advanced Robotics, 33:20, 1042-1059, DOI: 10.1080/01691864.2019.1657948
8. **M. G. Alkalla**, Y. Gao and A. Bouton, "Customizable and Optimized Drill Bits Bio-inspired from Wood-Wasp Ovipositor Morphology for Extraterrestrial Surfaces" 2019 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Hong Kong, China, 2019, pp. 430-435. DOI: 10.1109/AIM.2019.8868816
9. **Mohamed G. Alkalla** & Mohamed A. Fanni, (2019), "Integrated structure/control design of high-speed flexible robot arms using topology optimization", Mechanics Based Design of Structures and Machines, DOI:10.1080/15397734.2019.1688170
10. **Mohamed G. Alkalla**, Mahmoud Helal, Ahmed Fouly, "Superposition of Topology-Optimization Layouts Method for Non-Concurrent Loads: Application on Engine's Connecting Rod", Accepted with minor revision in International Journal for Numerical Methods in Engineering, (May 2020).
11. Craig Pitcher, **Mohamed Alkalla**, Xavier Pang, Yang Gao, "Development of the Third Generation of the Dual-Reciprocating Drill" Accepted for publication in special issue of Biomimetics (Biomimetics from Concept to Reality), ISSN 2313-7673, 9<sup>th</sup> July 2020.
12. Ahmed Fouly, **Mohamed Alkalla**, "Effect of Low nanosized alumina Loading Fraction on the Physico-mechanical and Tribological Behavior of Epoxy" Accepted for publication in Tribology International Journal, Elsevier, 6<sup>th</sup> July 2020.

## EDUCATION

2014–2017 **Ph.D.**, *Mechatronics and Robotics Engineering Dept.*, School of Innovative Design Engineering, Egypt-Japan University of Science and Technology (E-JUST), Alexandria, Egypt.  
**Degree Date:** 27-February-2017, CGPA: 3.83.

- 2009–2013 **M.Sc.**, *Production Engineering and Mechanical Design Department, Faculty of Engineering*, Mansoura University, Egypt.  
**Degree Date:** 29 July 2013: M.Sc. in Mechanical Design Engineering.
- 2002–2007 **B.Sc.**, *Production Engineering and Mechanical design Department, Faculty of Engineering Mansoura University, Egypt*, **Grade:** Excellent with Honour 85.87 % (*The First*).  
**Graduation Project:** “Design and Manufacture of Rolling Gear Tester Machine”. **Grade:** Excellent.

## ACADEMIC EXPERIENCES

### Teaching Courses:

1. Serial Robots Kinematics and Dynamics.
2. Engineering & Mechanical Drawing.
3. Optimum Design.
4. Mechanics of Materials.
5. Machine Design.
6. Design of Machinery.
7. Machine Tool Design.
8. Mechatronic systems.

### Academic Training Certificates:

1. Graduate Certificate in Learning and Teaching, Module 1, University of Surrey, UK
2. Scientific Publishing, Mansoura University, Egypt.
3. Quality Standards of Teaching Process, Mansoura University, Egypt.
4. Credit Hours System, Mansoura University, Egypt.
5. Applying Academic Standards to Learning Program, Mansoura University, Egypt.
6. Communication Skills in Different Learning Models, Mansoura University, Egypt.
7. Usage of Technology in Teaching, Mansoura University, Egypt.
8. Conference Organization, Mansoura University, Egypt.
9. Presentation Skills, Mansoura University, Egypt.
10. Strategic Planning, Mansoura University, Egypt.
11. University Code of Ethics, Mansoura University, Egypt.
12. Scientific Research and Methods of Universities Ranking, Mansoura University, Egypt.
13. Research Ethics, Mansoura University, Egypt.

### Int. Conferences & Workshops Participation:

- 18 July 2019 **FAIR-SPACE-Workshop**, *2<sup>nd</sup> workshop of Future Artificial Intelligence and Robotics for Space (FAIR-SPACE) Hub*, University of Liverpool, UK.
- 8–12 July 2019 **AIM**, *IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Hong Kong.
- 12 March 2019 **ROBOTICS AND ARTIFICIAL INTELLIGENCE INDUSTRY SHOWCASE**, *Manchester*, UK.
- 18 January 2019 **FAIR-SPACE-Workshop**, *1<sup>st</sup> workshop of Future Artificial Intelligence and Robotics for Space (FAIR-SPACE) Hub*, Imperial College London, UK.
- 20–24 July 2016 **ACIRS**, *IEEE Asia-Pacific Conference on Intelligent Robot Systems*, Tokyo, Japan.

- 14–19 July 2015 **AIM**, *IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Busan, Korea.
- 20–22 May 2015 **ICCAR**, *IEEE International Conference on Control, Automation and Robotics*, Nanyang Technological University, Singapore.
- 22–26 March 2015 **E–J Workshop**, *1<sup>st</sup> Egypt–Japan Workshop on Practical Education for Mechatronics and Robotics*, E-JUST, Alexandria, Egypt.

## INDUSTRY/PRACTICAL EXPERIENCES:

- 2006–2007 **Team Leader**, *Bachelor graduation project*, Rolling Gear Tester Machine, Excellent Grade.
- 2008–2010 **Maintenance & Quality-Control Engineer**, *Diesel Engines, Vehicle Workshops in the Egyptian Armed Forces*, Egypt.
- June 2011 **Mechanical Design Engineer**, *New Ship Lifting project in New Damietta Harbor*, Egypt.
- 2016 **Designer of EJBOT Climbing/Inspection Robot**, *Partnership with Waseda University*, Tokyo, Japan.
- 2017–2018 **Project Supervisor**, *Spot welding manipulator for industrial applications*, Mansoura University, Egypt.
- 2017–2018 **Project Supervisor**, *MIRA-A Robotic Arm Workstation*, Mansoura University, Egypt.

## PATENT

- April 2019 **UKIPO Patent**, *Design of Dual Reciprocation & Oscillation Drill (DROD) has been submitted for a patent at the UK Intellectual Property Office (UKIPO) with application number 2005716.2, UK.*

## AWARDS

- July 2019 **Best Paper Finalist**, *IEEE/ASME 2019 AIM conference*, Hong Kong.
- November 2017 **First Place Winner**, *2017 Machinery/Automation/Robotics Category in Create The Future Design Contest*, Tech Briefs Media Group, An SAE International Company, USA.
- May 2017 **Honored by President of Mansoura University**, *for awarding World Intellectual Property Organization trophy for Best Young Inventor from the Academy of Scientific Research & Technology*, Egypt.
- November 2016 **WIPO TROPHY**, *World Intellectual Property Organization, The Best Young Inventor from the Academy of Scientific Research & Technology*, in the 3<sup>rd</sup> Cairo International Exhibition of Innovation for EJBOT climbing robot project, Egypt.
- 2007 **Excellence Award from Egyptian Engineering Syndicate and Dakahlia Governorate**, *for graduation in Faculty of Engineering, Excellent grade with honor (The First)*, Mansoura, Egypt.

## LANGUAGES

- Arabic Mother tongue, Native language.
- English Very Good, **TOEFL** score: 80 (July 2015).

## COMPUTER SKILLS

- Modelling AutoCad, CATIA, SolidWorks, SolidEdge

Programming MATLAB, Visual Basic, Arduino, C++  
Tools Robotic Toolbox., MathCad  
Simulation SIMULINK, MSC ADAMS, ANSYS, Protues (Electronic Systems Simulators), Automation  
Softwares Studio .  
Miscellaneous Linux, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office.

## CERTIFICATES

CATIA Dassault Systemes  
Arduino Microcontroller Programming  
ICDL Certificate (International Computer Driving License)

## HOBBIES

Reading Romantic and Science-fiction novels, Walking, Listening music, Traveling, Playing Football, and Fishing.

## Doctor of Philosophy (Ph.D.)

2014–2017 **Ph.D. Degree**, *Mechatronics and Robotics Engineering Dept.*, School of Innovative Design Engineering, Egypt-Japan University of Science and Technology (E-JUST), Alexandria, Egypt.

**Degree Date:** 27-February-2017.

**Thesis title** “Versatile Climbing Robot for Industrial Vessels Inspection”

**Supervisors** Prof. Mohamed A. Fanni and Prof. Abdelfatah M. Mohamed, (E-JUST).

**Japanese Advisor** Prof. Shuji Hashimoto, (Waseda University, Tokyo).

**EJBot project video:**

<https://www.youtube.com/watch?v=xXKKpNN5MZE>

## Master of Science (M.Sc)

2009–2013 **M.Sc.**, *Production Engineering and Mechanical Design Department*, Faculty of Engineering, Mansoura University, Egypt.

**Degree Date:** 01-July-2013.

**Thesis title** “Topology Optimization of High Speed Flexible Robot Arms”.

**Supervisors** Prof. Mohamed A. N. Shabara and Assoc. Prof. Mohamed A. Fanni.



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