

# CURRICULUM VITAE (CV)

Safanah M. Raafat

## CONTACT INFORMATION

NAME	Safanah M. Raafat
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## EMPLOYMENT HISTORY

COMPANY NAME:	University of Technology –Control & System Engineering Dept.
COMPANY ADDRESS:	Baghdad- Iraq
START DATE:	2014
END DATE:	Till now
POSITION:	Head of Control of Medical System engineering Branch
RESPONSIBILITIES :	<ul style="list-style-type: none"><li>• Render management and other services to the department and university like preparation of curriculum.</li><li>• Conduct research, Lecturing Postgraduate course: Discrete Mathematics; System Identification, Optimization. Lecturing Undergraduate course: Process Control, Artificial Intelligence; Demonstrating Engineering Design and Control labs, Supervising M.Sc. projects.</li><li>• Member of Automation and Robotic Research Unit.</li></ul>

COMPANY NAME:	University of Technology –Control & System Engineering Dept.
COMPANY ADDRESS:	Baghdad- Iraq
START DATE:	2011
END DATE:	Till now
POSITION:	Assistance Professor.
RESPONSIBILITIES :	<ul style="list-style-type: none"><li>• Conduct research,</li><li>• Lecturing Postgraduate course: optimization and Optimal control Real Time Control System, Discrete Mathematics;</li><li>• Lecturing Undergraduate course: Process Control, Artificial Intelligence; Engineering analysis.</li><li>• Demonstrating Engineering Design and Control labs.</li><li>• Supervising final year project.</li></ul>

	<ul style="list-style-type: none"> <li>• Supervising M.Sc. projects.</li> <li>• Member of Automation and Robotic Research Unit.</li> </ul>
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COMPANY NAME:	International Islamic University Malaysia
COMPANY ADDRESS:	P.O.Box 10, 50728, Gombak ,Kuala Lumpur Malaysia
START DATE:	2008
END DATE:	2011
POSITION:	Ph.D. student, Researcher, part time lecturer, grader, tutor, demonstrator.
RESPONSIBILITIES :	<ul style="list-style-type: none"> <li>• Conduct research, Lecturing mechatronics related course: Digital system design, Tutoring mechatronics related course: Control system theory, Demonstrating in Analog Electronics and Control labs. Contributing and advising final year project.</li> </ul>

COMPANY NAME:	University of Technology –Control & System Engineering Dept.
COMPANY ADDRESS:	Baghdad – Iraq
START DATE:	2003
END DATE:	2007
POSITION:	Head of Mechatronics branch/ Control & System Dept. and Lecturer
RESPONSIBILITIES :	<ul style="list-style-type: none"> <li>• Render management and other services to the department and university like preparation of curriculum.</li> <li>• Supervision of final year projects of B.Sc. and M.Sc. students, Lecturing: system identification, modeling and simulation, measurement and instrumentation, expert systems and artificial intelligent, Demonstrator in Digital Control and neural network Design Lab. using MATLAB and LabView.</li> <li>• Conduct research on adaptive control, Kalman filter applications in estimation, sliding mode and neural network control.</li> </ul>

COMPANY NAME:	University of Technology , Baghdad University
COMPANY ADDRESS:	Baghdad – Iraq
START DATE:	1993
END DATE:	2003
POSITION:	Lecturer
RESPONSIBILITIES:	<ul style="list-style-type: none"> <li>• Lecturing: Computer Technology, Instrumentation, Computer Control, artificial intelligent technology, Programming with: C;</li> </ul>

	Visual BASIC; Pascal, Design using MATLAB, Supervision of final year projects of B.Sc., Conduct research on expert control, sliding mode control, Digital Control Design and optimization using MATLAB and BASIC, Demonstrating in Digital instrumentation design and applications lab.
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COMPANY NAME:	University of Technology
COMPANY ADDRESS:	Baghdad – Iraq
START DATE:	1985
END DATE:	1988
POSITION:	Engineer
RESPONSIBILITIES:	Working in the following laboratories: Personal Computer, Electronics, Microprocessors Technology, Control, and Instrumentation, Demonstrating in controller design using optimization Techniques lab. And PC maintenance.

#### **EDUCATIONAL BACKGROUND**

YEAR	SCHOOL
2011-2012	Postdoctoral in Mechatronics Engineering (MCT) / Faculty of Engineering/ International Islamic University Malaysia, nonlinear intelligent control
2008-2011	Ph.D. in Mechatronics Engineering (MCT) / Faculty of Engineering/ International Islamic University Malaysia Intelligent Robust Control for High Precision Positioning Systems using Adaptive Neuro Fuzzy Inference System. <b>Grade: Excellent.</b>
1988-1990	M.Sc. Control and Instrumentation Engineering Control & System Engineering/ University of Technology / Baghdad/Iraq Thesis: Investigation into the Use of Expert Systems in Process Control <b>Grade: Very Good</b>
1982 -1985	B.Sc. in Control & System Engineering/ University of Technology/ Baghdad/Iraq <b>Grade: Good</b>

#### **TRAINING COURSE ATTENDED**

DATE ATTENDED	NAME OF COURSE
2011	Dealing with Embedded Systems using MATLAB

2009	Labview in measurement and control/ NI Instrumentation/Kuala Lumpur
2008	Introducing Maltisim /IIUM
1988	Maintenance of PCs/ National center of Computers/ Baghdad
1987	Instruments applications/ University of Technology/Baghdad
1986	Microprocessor Technology/ University of Technology/Baghdad

#### **SKILLS AND ACTIVITIES**

<b>SKILLS:</b>	<ul style="list-style-type: none"> <li>• MATLAB programming, multisim and LabView programming, Simulation and practical implementations via interface.</li> <li>• Ability to mix well with staff members and students.</li> </ul>
<b>PROFFESIONAL AFFILIATION AND ACTIVITIES</b>	<ol style="list-style-type: none"> <li>1. IEEE Senior member ;Service as a member in IEEE Control System Society.</li> <li>2. ACA member.</li> <li>3. Preparation of Workshops –IEEE/ Control System Society: <ol style="list-style-type: none"> <li>a. Robotics and Embedded Systems, March 2017</li> <li>b. Identification using MATLAB, UITM, March 2011,</li> <li>c. Uncertainty representation and robust controller design using MATLAB, UITM, April 2011,</li> <li>d. Optimization theory and algorithms using MATLAB, UITM, April 2011.</li> </ol> </li> <li>4. Working on projects, workshops and participating in festivals within Automation and Research Unit at Control and System Engineering Dept.</li> <li>5. Supervisor of the following Master theses: <ol style="list-style-type: none"> <li>a. Improving Trajectory Tracking of SCARA Robot Using Neural Networks.</li> <li>b. Optimized Performance of 3DOF Helicopter System using Extremum Seeking Control.</li> <li>c. Intelligent Scheduling Techniques for Real Time Applications.</li> <li>d. Robust Controller Design and Analysis of a Haptic Control System for Medical Applications.</li> <li>e. Optimized performance of network control system using particle swarm optimization.</li> </ol> </li> <li>6. <b>Reviewer for papers of journals:</b> <ol style="list-style-type: none"> <li>a. International Journal of Advanced Robotic Systems, Manuscript Number: IJARS-D-15-00002, Design of a Knee Exoskeleton using Foot Pressure and Knee Torque Sensors.</li> </ol> </li> </ol>

	<p>b. Mechatronics. Manuscript Number: MECH-D-14-00146, Title of Manuscript: Hysteresis Control of DEAP Smart Actuator with Rate-Dependent Compensation.</p> <p>c. ICA, paper ID: 7900331, Determining Correlation Between Probability Of Stability and Reliability at Discrete Systems.</p> <p>d. ICA, Paper ID: 7900320, Robust Static Output Feedback Approach for Optimal Fuzzy Tracking Control Problem of Nonlinear Uncertain Time Delay Systems <math>H_\infty</math></p> <p>e. Mechatronics. Manuscript Number: MECH-D-12-00339, Title of Manuscript: Safety analysis of mechatronic product lines.</p> <p>f. Journal of Machinery Manufacturing and Automation (JMMA). Manuscript Number: JMMA 10046. Title of Manuscript: Cutter contacting machining paths generation method for surface flat-end milling.</p> <p>g. Neural Computing and Applications. Manuscript Number: NCA-3251, Manuscript Title: Improvement of Spatial Spectral Estimation Performance for Imaging of Concealed Rods Based on Multilayer Neural Network.</p> <p>h. Journal of Machinery Manufacturing and Automation (JMMA). Manuscript Title: Trials of Discrete Values Control by a Tracked Model for Wing Sale Eco-ship.</p> <p>i. International Journal of Advanced Robotic Systems, ID: M.2012.0047 entitled :Continuous Surface Rending, Passing From CAD To Physical Representation.</p> <p>j. International Journal of Advanced Robotic Systems, Manuscript number: ARS.2012.0012, Title of manuscript: Robust sliding mode fuzzy control for positioning a manipulator mobile robot.</p> <p>k. Journal of Intelligent and Robotic Systems. Manuscript Number: JINT1153, Title: A Quadratic Performance Index Proposed and Verified for Self-motion Planning of Robot Manipulators.</p> <p>l. International Journal of Advanced Robotic Systems. Manuscript Number: ARS.2011.31R, Title: Probabilistically Robust Fault Detection Filter Design.</p> <p>m. International Journal of Advanced Robotic Systems. Manuscript number: SIARS.2011.New.12 Title of Manuscript: SVM-Based Control System for Robot.</p> <p>And many other papers.</p>
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## 7. Reviewer for conferences:

- a. The 10th Asian Control Conference 2015 (ASCC 2015)  
to be held on upcoming 31st May - 3rd June 2015,  
Venue: Kota Kinabalu, Malaysia.
- b. Zaytoonah University International Engineering  
Conference on Design and Innovation in Sustainability  
2014, Indirect Adaptive Type-2 Fuzzy Sliding Mode Control  
for Non-Linear SISO Systems, Amman -Jordan.
- c. ECCCA 2014, The Second Engineering Conference of  
Control, Computer, 4 and Mechatronics Engineering, Control  
and System Engineering Dept., Baghdad.
- d. 2013 IEEE 5th International Conference on  
Engineering Education (ICEED2013).
- e. CEAT 2013.
- f. ICSGRC 2013.
- g. ISBEIA 2013 (2013 IEEE Symposium on Business,  
Engineering & Industrial Applications).
- h. SHUSER 2013.
- i. 9th IEEE Colloquium on Signal Processing and its  
Applications (CSPA 2013).
- j. 2013 IEEE Business, Engineering & Industrial Applications  
Colloquium.
- k. SCORED 2012 (2012 IEEE Student Conference on  
Research and Development)
- l. ICEDSA 2012.
- m. PECON 2012
- n. ISBEIA 2012 (2012 IEEE Symposium on Business,  
Engineering & Industrial Applications).
- o. ISIEA 2012 (2012 IEEE Symposium on Industrial  
Electronics and Applications).
- p. 2012 IEEE Symposium on Humanities, Science &  
Engineering Research, SHUSER 2012, Malaysia.
- q. ROCOND'12, IFAC, Denmark.
- r. IAPEC 2012, Malaysia.
- s. 2012 IEEE Symposium on Industrial Electronics and  
Applications, Malaysia.
- t. 2012 IEEE Business, Engineering & Industrial Applications

	<p>Colloquium , BEIAC 2012, Malaysia.</p> <p>u. 2011 IEEE Student Conference on Research and Development, SCORED 2011, Malaysia.</p> <p>v. 2011 4th IEEE International Conference on Computer Science and Information Technology, ICCSIT 2011, Chengdu-China.</p> <p>w. IEEE Symposium on Industrial Electronics &amp; Applications (ISIEA 2011) ISIEA2011, Langkawi, Malaysia.</p> <p>x. SCORED 2011 (2011 IEEE Student Conference on Research and Development), Malaysia.</p> <p>y. 2010 IEEE Multi-Conference on Systems &amp; Control (MSC10), Yokohama, Japan.</p> <p>And many other conferences.</p>
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**LIST OF PUBLICATIONS**

<p>REFEREED JOURNAL PUBLICATIONS</p>	<ol style="list-style-type: none"> <li>1. S.M. Raafat and H.A.Ali, Robust Controller Analysis and Design of Medical Haptic Control System, <i>Engineering and Technology Journal</i> , Vol. 35, Part A. No. 4, ,pp. 318-326, 2017.</li> <li>2. S.M. Raafat, A.M.Hassan and K.A.Galib, Enhanced Performance of Consensus Wireless Sensor Controlled System via Particle Swarm Optimization Algorithm, <i>Journal of Engineering-University of Baghdad</i>, Vol.23, No.9, pp.63-77 , 2017.</li> <li>3. Safanah M. Raafat, Shaymaa M. Mahdi, "Improved Trajectory Tracking Control for a Three Axis SCARA Robot Using Fuzzy Logic", <i>IJCCCE</i> Vol.16, No.1, pp.11-19, 2016.</li> <li>4. S.M. Raafat and R. Akmeliawati, "Intelligent <math>H_2/H_\infty</math> Robust Control of an Active Magnetic Bearings System", <i>Al-Khwarizmi Engineering Journal</i>, Vol.11, Issue 2, 2015.</li> <li>5. Fatin Telchy, Safanah Raafat , "Intelligent Neural Network with Greedy Alignment for Job-Shop Scheduling", <i>IJCCCE</i> Vol.15, No.3, 2015.</li> <li>6. S.M. Raafat, Shibly, A. Al-Samaraai, Ali, M. Mahmood, "Unity Sliding Mode Controller Design for Active Magnetic Bearings System", <i>Journal of Engineering</i> 21 (6) , 2015.</li> <li>7. S.M. Raafat and R. Akmeliawati, "Design of Robust <math>H_\infty</math> controller for precise positioning system", <i>Intelligent control and automation (ICA)</i>, Vol.3, 262-273, 2012.</li> <li>8. R. Akmeliawati, S.M. Raafat, and Wahyudi" Improved Intelligent Identification of Uncertainty Bounds; Design, Model Validation and Stability Analysis", <i>International Journal of Modeling,</i></li> </ol>
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	<p><i>Identification and Control- special issue: Neural Network and Fuzzy Logic</i>, Vol.15,No.3, 2012.</p> <p>9. S.M. Raafat and R. Akmeliawati, “Survey on Robust control of precise positioning systems”, <i>Recent Patents on Mechanical Engineering/ Bentham Science Publishers</i>, January,Vol.5, 2012.</p> <p>10. S. M. Raafat, R. Akmeliawati and Wahyudi,” Intelligent Robust Control Design of a Precise Positioning System”, <i>International Journal of Control, Automation and Systems</i>, Oct.2010.</p> <p>11. S.M. Raafat,"State Estimation of Synchronous PM Motor Drive based on pole Assignment ", <i>Journal of Engineering &amp; Technology</i>, 7, 2006.</p> <p>12. S.M. Raafat, “Robust Variable Structure Control for Time Delay Systems”, <i>Journal of Engineering &amp; Technology</i>, Vol.17, No.8, 1998.</p> <p>13. R.Al-Aqidi and S.M. Raafat, “Design of Robust VSS Controller Incorporating Pole Assignment”, <i>Journal of Engineering &amp; Technology</i>, Vol.14, No.6, 1995.</p> <p>14. L. Al-Chalabi and S.M. Raafat, “Design of an Optimal Controller for Discretized Varying Time Delay Systems”, <i>Journal of Engineering &amp; Technology</i>, Vol.9, No.3, 1990.</p>
<p>REFEREED CONFERENCES</p>	<ol style="list-style-type: none"> <li>1. Safanah M. Raafat, Shahad Sami Ali, Rini Akmeliawati, Real Time Optimization and Control of 3DOF Helicopter System Via Extremum Seeking Algorithm, ASCC 2015, May 31, 2015, Malaysia.</li> <li>2. Fatin Telchy, Safanah Raafat , Intelligent Job-Shop Scheduling Using Neural Network, Zaytoonah University International Engineering Conference on Design and Innovation in Sustainability 2014 , (ZEC Sustainability 2014), May 13-15, 2014 Amman, Jordan.</li> <li>3. Safanah M. Raafat, Shahad Sami Ali, The Selection Of Dither Signal in Extrimum Seeking Control Of 3 Dof Helicopter System, Zaytoonah University International Engineering Conference on Design and Innovation in Sustainability 2014 , (ZEC Sustainability 2014), May 13-15, 2014 Amman, Jordan.</li> <li>4. Safanah M. Raafat , Sarah K. Ibrahim , Sarah S. Mahmood, Educational Software Package on Scheduling Algorithms for Real Time Control Applications , ECCCA 2014, Baghdad.</li> <li>5. Mina Qays Kadhim, Safanah M. Raafat, Taghreed M. Mohammed, Receding Horizon Control of an Active Magnetic</li> </ol>



	<p>Bearings System via Model Predictive Control, ECCCA 2014, Baghdad.</p> <ol style="list-style-type: none"> <li>6. S.M. Raafat and R. Akmeliawati, "Optimized State Feedback Regulation of 3DOF Helicopter System via Extremum Seeking", ASCC2013, Turkey.</li> <li>7. S.M. Raafat and R. Akmeliawati, "Robust disturbance rejection control of helicopter system using intelligent identification of uncertainties", International symposium on robotics and intelligent sensors (IRIS 2012), Malaysia.</li> <li>8. S.M. Raafat R. Akmeliawati and Legowo, A. "Intelligent estimation of uncertainty bounds of an active magnetic bearings using ANFIS", ICIEM 2011, China, 2011.</li> <li>9. S.M. Raafat and R. Akmeliawati, "Constrained optimization of performance weighting function for Precise Robust Positioning Control System", ICOM' 11, 2011.</li> <li>10. S.M. Raafat, Wahyudi and R. Akmeliawati, "Enhanced Servo Performance of a single Axis Positioning System in an Intelligent Robust Framework", 2010 IEEE Multi-Conference on Systems &amp; Control (MSC10), Yokohama, Japan.</li> <li>11. S.M. Raafat, R. Akmeliawati, and Wahyudi, "Improved Intelligent Identification of Uncertainty Bounds for Robust Controller Design", 2010 International Conference on Computer Applications &amp; Industrial Electronics ( ICCAIE)2010, Kuala Lumpur, Malaysia, 2010.</li> <li>12. S.M. Raafat, R. Akmeliawati, and Wahyudi, "Design and Analysis of <math>H_{\infty}</math> Robust Controllers Using Different Uncertainty Structures", 2010 IEEE Control and System Graduate Research Colloquium (ICSGRC), Shah Alam, Malaysia. (<i>Best Student Paper</i>)</li> <li>13. S.M. Raafat and R. Akmeliawati, "Intelligent Disturbance rejection for robust Tracking Performance of X-Y Positioning System", 2010 IEEE International Conference on Mechatronics and Automation (ICMA 2010), Xian, China.</li> <li>14. S.M. Raafat, Wahyudi and R. Akmeliawati, "Comparative Study of Parametric and Intelligent Unstructured Uncertainties for Robust Controller Design", 2009 IEEE Symposium on Industrial Electronics &amp; Applications (ISIEA 2009), Kuala Lumpur, Malaysia, Oct. 2009.</li> <li>15. S.M. Raafat, W.K. Said, R. Akmeliawati and N.M. Tariq, "</li> </ol>
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	<p>Improving Trajectory Tracking of a Three Axis SCARA Robot Using Neural Networks”, 2009 IEEE Symposium on Industrial Electronics &amp; Applications (ISIEA 2009), Kuala Lumpur, Malaysia, Oct. 2009.</p> <p>16. Raafat, S.M., Wahyudi, Akmeliawati, R. and Ari. Legowo, “Robust Identification of a Single Axis High Precision Positioning System”, 2009 5<sup>th</sup> Int. Colloquium on Signal Processing &amp; Its Applications (CSPA), Kuala Lumpur, Malaysia, 2009.</p> <p>17. S.M.Raafat and Wahyudi, ”Comprehansive Modeling for Simulation and Control of a Single Axis High Precision Positioning System”, International Conference on Electronic Design, Penang, Malaysia, Dec.2008.</p>
BOOK CHAPTERS	<ol style="list-style-type: none"> <li>1. Mathematical Advances Towards Sustainable Environmental Systems: Context and Perspectives, Springer, 2016 .</li> <li>2. Introduction to Robotics- mathematical issues, Springer,2016..</li> <li>3. Intelligent and Robust Path Planning and Control of Robotic Systems, Springer, 2016.</li> <li>4. Introduction. <i>Computational Intelligence in Robust Control</i>. IIUM, 2011.</li> <li>5. Intelligent Robust Control for Precise Tracking Performance of X-Y Positioning System. <i>Computational Intelligence in Robust Control</i>.IIUM, 2011.</li> </ol>
AWARDS	<ol style="list-style-type: none"> <li>1. <b>Gold Shield</b>, The First Teacher in Department of Control and System Engineering, 2015.</li> <li>2. <b>Gold Shield</b>, The first Woman in Teaching in Department of Control and System Engineering,2014</li> <li>3. <b>Best Application paper award</b> for” Optimized State Feedback Regulation of 3DOF Helicopter System via Extremum Seeking”, ASCC2013,Turkey.</li> <li>4. <b>Bronze Medal</b>. Legowo, A., Raafat, S.M., Wahyudi &amp; Akmeliawati, R. (2010). Intelligent Robust Control of High Precision Positioning Systems Using ANFIS. IIUM Research Invention and Innovation Exhibition 2010.</li> <li>5. <b>IEEE Control System Travel Award</b> to present the paper titled: “Enhanced Servo Performance of a single Axis Positioning System in an Intelligent Robust Framework” at the 2010 IEEE Multi-Conference on Systems &amp; Control (MSC10), Yokohama, Japan.</li> </ol>

	<ol style="list-style-type: none"><li data-bbox="475 186 1421 304">6. <b>Certification of biographical record</b> in Who's Who in <b>Science and Engineering</b>, Eleventh Edition, 2011-2012, Marquis Who's Who Publication Board.</li><li data-bbox="475 304 1421 445">7. <b>Outstanding Intellectual Diploma for Contributions in the field of Engineering, 2012.</b>International Biographical Center (IBC), Cambridge, England.</li></ol>
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