Dr. Omar Ahmad

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Objectives

I want to become an independent researcher in the field of Autonomous Robots and Human Robot Interaction. I am also passionate about teaching at the university level and looking forward to a career in academia.

Key Skills & Interests

- Robotics
- Machine Learning
- Artificial Intelligence
- Computer vision
- Embedded systems

Professional work experience

Current	**Assistant Professor** COMSATS University Islamabad
2012 – 2015	**PhD Scholar at Politecnico di Torino (Italy)** • Worked under supervision of Prof. Basilio Bona • Worked on gesture recognition under the HRI framework • Went to NUS Singapore for a 6-month research project (Vision Guided Surgical Robot etc)
Oct 2009 – Feb 2012 Nov 2006 – Sep 2009	**Assistant Professor/Researcher** **Lecturer** COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan (www.comsats.edu.pk) • Research and project supervision in robotics • Academic/Teaching responsibilities • Technical responsibilities (Lab. head)

Research project:
- Multi robot framework for research (WanderBots)
  The framework comprises of 3 autonomous/remote controlled robots having GPS, GSM, RF interfaces and is equipped with SONAR, touch, temperature sensors and encoders. The first two robots (Master Bot and Forker Bot) are wheeled robots using DC gear motors employing differential drive and reverseackerman mechanism respectively. While the third robot 'Hexapod' is an insect like robot using servo motors.

R&D projects supervised:
- Design and implementation of AI controlled multi-robot system for Robocup Small Sized League
- Stereo vision navigation system for WanderBots
- Autonomous mobile robot with line tracking and collision avoidance capabilities
- Design and implementation of a magnetic levitation system
- Home automation system using GSM interface
- Design of AVR development boards
- Development of an improved ranging system using SONAR ring and sensor fusion

May – Oct. 2004	**Software Engineer** Streaming Networks (Pvt) Ltd., Islamabad, Pakistan (www.streaming-networks.com) • Research in quality improvement of video codecs • Programming of video codecs.

Resume: Omar Ahmad

Educational Qualifications

PhD (2012-2015)	**Mechatronics (Robotics and Computer Vision)** Politecnico di Torino, Turin, Italy Supervised by Dr. Basilio Bona Research

- Human hand gesture recognition from video stream.
- Vision based mapping of the endo-nasal track for automated insertion of surgical robots.
- Detection of surgical tool position in ultra-sound video.

Masters (2005–2007)	**Computer Engineering** National University of Science & Technology (NUST), Rawalpindi, Pakistan (www.nust.edu.pk) **Research Title:** Coordination in multi-robot systems without communication (using stigmergy)

Bachelor (1999–2003)	**Electrical Engineering** National University of Science & Technology (NUST), Rawalpindi, Pakistan Thesis & projects:

- Control of a 5 links robotic arm manipulator
- Design of an autonomous fire fighting robot
- Autonomous ball potting robot – Design & implementation
- Trellis coded modulation based transceiver design and implementation using BlackFin DSP

Software Skills

Electronics:	Proteus, OrCAD
Mechanical:	ProE, AutoCAD
Programming:	OpenCV, C/C++, MATLAB, Python, Assembly
O.S.:	Ubuntu Linux, Windows
Misc:	ROS, LabView, MS Project, MS Office

Courses Lectured

- Robotics (Graduate Course)
- Computer Vision (Graduate Course)
- Microprocessor Systems and Interfacing
- Digital Image Processing
- Introduction to Computer Programming
- Data Structures and Algorithms
- Engineering Drawing

Publications

- Hussain, B., Khan, A., Javaid, N., Hasan, Q., Malik, S.A., Ahmad, O., Dar, A.H., Kazmi, A. (2019). A Weighted-Sum PSO Algorithm for HEMS: A New Approach for the Design and Diversified Performance Analysis. *Electronics* 8 2 180, 2079-9292
- Jamil, M., Ahmad, O.M., Poh, K., & Yap, C.H. (2017). Feasibility of Ultrasound-Based Computational Fluid Dynamics as a Mitral Valve Regurgitation Quantification Technique: Comparison with 2-D and 3-D Proximal Isovelocity Surface Area-Based Methods. *Ultrasound in medicine & biology, 43 7*, 1314-1330.
- Ahmed, Junaid & Tiwana, Moazzam-Ul-Islam & Ahmad, Omar & Sohaib, Sarmad. (2017). Energy and area spectral efficiency (ASE) trade-off for MC-CDMA with carrier frequency offset. Turkish Journal of Electrical Engineering and Computer Sciences. 25. 3052-3060. 10.3906/elk-1608-285.
- Ahmad O, Bona B, Anjum ML and Khosa A, "Using Time Proportionate Intensity Images with Non-Linear Classifiers for Hand Gesture Recognition". Presented at 8th International Conference on Robotics, Vision, Signal Processing & Power Applications (ROVISP 2013), Malaysia.
- Ahmad O, I. Ullah and J. Iqbal, "A multi-robot educational and research framework", International Journal of Academic Research (IJAR) Part A, ISSN: 2075-4124 (print), 2075-7107 (online), 2014, 6(2):217-222
- Anjum ML, Ahmad O, Bona B, Rosa S, Yin J, "Skeleton Tracking Based Complex Human Activity Recognition Using Kinect Camera". presented at International Conference on Social Robotics (October 2014), Australia.
- Anjum ML, Ahmad O, Bona B, and Cho DI, "Sensor Data Fusion using Unscented Kalman Filter for VOR-based Vision Tracking System for Mobile Robots". Presented in Towards Autonomous Robotic Systems (TAROS 2013), Oxford, UK

- Iqbal, J.; Ahmad, O.; Malik, A. , *"HEXOSYS II – Towards realization of light mass robotics for the hand."* In Proceedings of IEEE International Multitopic Conference (INMIC 2011). pp. 115-119
- O. Ahmad, J. Iqbal and M.A. Khan, *"Coordination without Communication: Finite State Automation in Behavior Based Multi-Robot Systems."* In Proceedings of IEEE International Conference on Information and Emerging Technologies (ICIET) 2007, pp. 211-214.

English Language Skills

- IELTS 7.5
- GRE (Verbal: 570, Quantitative: 780)
- English has been medium of instruction for 18 years

References

- Prof. Dr. Basilio Bona
  Full Professor of Robotics,
  Dipartimento di Automatica e Informatica,
  Politecnico di Torino.
  Email: basilio.bona@polito.it
  Phone: +39 347 252 4602

- Dr. Jamshed Iqbal
  Lecturer (Assistant Professor) - Robotics
  Department of Computer Science and Technology,
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Resume: Omar Ahmad