



Personal information:

Name: Mohammad Reza Karafi

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Education/Achievement:

Degree	Institution	Field	Average	Date
Diploma	ROSHD High School(Tehran)	Mathematics &Physics	19.60	1998-2002
B. S	Iran University of Science and Technology	Manufacturing Engineering	17.35	2002-2006
M. S	Tarbiat Modares University	Manufacturing Engineering	18.32	2006- 2008
PhD	Tarbiat Modares University	Manufacturing Engineering	18.26	2008- 2013

- 1st Rank graduate student in Mechanical Engineering, Iran University of Science and Technology, B.Sc (2006)
- 1st Rank graduate student in Mechanical Engineering, Tarbiat Modares University, M.S (2008)
- 1st Rank graduate student in Mechanical Engineering, Tarbiat Modares University, PhD (2013)

- 1st Rank in PhD entrance examination, Tarbiat Modares University (2008)
- Six months sabbatical to complete PhD thesis, at Mechanical Engineering department University of British Columbia (UBC) Vancouver, Canada (2012).
- Superior researcher in Mechanical Engineering Faculty, Iran University of Science and Technology(2005)
- Forth rank in Khwarizmi International Award (KIA) for continues welding robot project (2005)

Thesis:

- B. Sc. Thesis: Design & manufacture of continues welding robot (with capability of automatic control of arc length & TIG welding of unflat work pieces)
- M. Sc. Thesis: Design & Fabrication of novel ultrasonic motor with roller interface
- PhD thesis : Design, fabrication and characteristic investigation of torsional magnetostrictive transducer

Area of interests:

- Sensors and Actuators, Mechatronics, Smart materials, Ultrasonic devises, Ultrasonic power supplies, Industrial Automation, precision engineering

Papers & patents:

- “An Approach to Design and Fabrication of Resonant Giant Magnetostrictive Transducer”, published in journal of smart structure and system, February 2016
- "Development of Magnetostrictive Resonant Torsional Vibrator ", published in IEEE transaction on magnetic, 28, April 2015,
- “a Combined Preisach-Hyperbolic Tangent Model for magnetic hysteresis of Terfenol-D”, published in journal of Magnetism and Magnetic Materials, 2 August 2015.
- “An in vitro study of thermal necrosis in ultrasonic-assisted drilling of bone”, published in journal of engineering in medicine, 9 Jan 2015,
- “Study on Classical and Excess Eddy Currents Losses of Terfenol-D”, published in journal of Magnetism and Magnetic Materials, 6 April 2015.

- "A novel magnetostrictive torsional resonant transducer" Published in Journal of Sensors and Actuators A: physical, 13 March 2013.
- "A new hybrid longitudinal–torsional magnetostrictive ultrasonic transducer", Published in Journal of smart material and structure, 30 April 2013.
- “Introduction of Roller Interface Ultrasonic Motor (RIUSM)” Published in Journal of Sensors and Actuators A: physical, 3 July 2010.
- “Development of an inductive encoder for simultaneous measurement of two-dimensional displacement” Published in International journal of advance manufacturing and technology, 28 July 2010.
- “Study on Automatic Control of Arc Gap in Robotic TIG Welding” Published in International journal of advance manufacturing and technology, 3 Feb 2010.
- “Two dimensional inductive encoder for measuring 2D displacement” The 2008 IEEE/ASME international Conference on Advance Intelligent Mechatronics- Xi’an, China-2-5 July 2008.
- “A Novel Ultrasonic Motor with Roller Interface (RUSM)” the 2009 IEEE/ASME international Conference on Advance Intelligent Mechatronics- Singapore - July 14-17, 2009.
- “A practical and mathematical approach to arc length control in automation of TIG welding process” 4th International conference and exhibition on design and machines and dies/mold cesme, TURKEY, 21-23/6/2007.
- “TIG welding automation of unflat surface” Computer Technology in Welding and Manufacturing Conference, 17-19 June 2008, Cranfield University, Cranfield, UK.
- “Generation of torsional vibration in stepped aluminum horn using magnetostictive patches, 3rd international conference on manufacturing engineering ICME2011, Tehran University, Iran.
- "Efficiency Investigation of a Self-Sensing Giant Magnetostrictive Actuator", 3rd international conference on manufacturing engineering ICME2011, Tehran University, Iran.
- "Study on the Magnetic Hysteresis of Terfenol-D Using New Hybrid Model" Key Engineering Materials Vol. 605 (2014) pp 519-522

- Patent:” Manufacturing of Continues Welding Robot" 15-Aug-2005 Patent No: 32358.

Projects:

- Design and fabrication of new 2D inductive encoder for measuring 2D displacement simultaneously.
- Research Assistant (RA) in the project of “Design and manufacture of Magnetic bearing in 5000 RPM”.
- Design of “Long Rang Guided Wave Ultrasonic Testing (LRGWUT) set” for defect detecting of oil pipes.
- Design and manufacture of “wheeled Wireless Robot” for Automotive research center of Defense Ministry of Iran.
- Design and fabrication of piezoelectric ultrasonic transducer in different sizes, frequency and powers
- Design and manufacture of switching ultrasonic power supply with various powers of 200 to 3000 W and frequency from 10 to 45 kHz.
- Design and manufacture of an ultrasonic cleaning system for gun pipes
- Design and manufacture of hot wire sensor to measure heat conduction coefficient of polymers
- Design and manufacture of a data logger to measure torque and axial force of reometer.
- Design and manufacture of 30 kW rectifier as a power supply of the electrochemical machining process.

Summary of Jobs:

- Full time faculty member of mechanical engineering faculty, Tarbiat Modares University, Tehran, Iran from 2014.
- Executive manager of ALFA Co. from 2014, production of ultrasonic and plasma power supplies.
- Research and innovation center of Saipa Corporation, Expert in Noise-Vibration-Harshness (NVH) Lab.
- Research and development center of Mega motor Co. , division of design of electrical and electronic system

Membership of scientific society:

- Society of Iranian Manufacturing Engineers.

Courses taught:

- Tarbiat Modares University
 1. Mechatronics 1 & 2
 2. Control of analogue systems
 3. Smart materials and structures
 4. Advanced engineering mathematics

Software skills:

- CATIA
- Solid works
- Auto CAD
- Visual Nastran
- Ansys
- Matlab
- Automation Studio
- Mechanical Desktop
- Mech Soft
- Labview
- C
- Code vision
- IAR
- Keil
- COMSOL multi physics

Professional experiences:

- Industrial automation & Mechatronics projects
- Ultrasonic application
- Smart material application
- Design and manufacture of power supply (DC to DC, DC to AC, AC to AC, Analogue, switching)
- Micro controller programming
- Design and implementation of data acquisition system for mechatronic systems
- Design and implementation of analogue and digital electronic circuits