

Resume
Hamid D. Taghirad
Professor

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- Education:**
- Ph.D. in Electrical Engineering** 1997
[McGill University](#), Montreal, Canada. Supervisors: Prof. P. [Belanger](#) and Prof. G. [Zames](#)
Thesis title: Robust torque control of harmonic drive systems, GPA 4/4.
 - M.Sc. in Mechanical Engineering** 1993
[McGill University](#), Montreal, Canada. Supervisor: Martin Buehler,
Thesis title: Implementation and control of a hopping robot, GPA 4/4.
 - B.Sc. in Mechanical Engineering** 1989
[Sharif University](#) of Technology, Tehran, Iran.
The second-best student (2/45) in the department, GPA 3.75/4.

Research Experience:

Industrial Contracts @ Advanced Robotics and Automated Systems (ARAS)

- Design and implementation of a 4DOF piston-casting industrial robot ([D&A 101](#)). Grant 22 K\$
- Design and implementation of an automatic radial welding robot for pipes ([D&A 110](#)). Grant 150K\$
- Design of climbing robot for automatic washing of road lights (D&A 120). Grant 25 K\$
- Design and implementation of an automatic casting machine ([D&A 201](#)). Grant 320K\$
- Design and implementation of a semi-automatic light guided assembly table for electronic boards. ([D&A 301](#)) Grant 110K\$
- Design and implementation of an automated quality control system for piston pins ([D&A 310](#)); including ultrasonic, Eddy current flaw detection units and dimension testing with sub-micron accuracy. Grant 205K\$
- Development of Statistical Process Control (SPC) software ([D&A 320](#)). Grant 75 K\$
- Design and implementation of an automatic robotic cell: ([D&A 401](#)); Grant 115K\$
- Analysis and design of Nekka Power Plant control logic ([D&A 410](#)). Grant 138K\$
- Design and Implementation of [a planar cable-driven parallel redundant manipulator](#) Grant 102K\$
- Gas industry supervisor on the design and implementation of High resolution MFL, TFI and EGP intelligent pigs ([Intelligent PIG](#)). Grant 310K\$
- Object detection and tracking on [ARAS Driver-less Car](#) Grant 175K\$
- Control Structure development on [ARAS Electric Motorcycle](#) Grant 121K\$

Current Projects @ Robotics Lab, K. N. Toosi U. of Tech.

- [Autonomous Robotics](#) 2006-Current
Development of autonomous [ground](#) and [aerial robots](#), implementation of SLAM, Fast SLAM, iSam, G2O, [3D visual navigation](#), deep learning methods on object detection and tracking, [driver assistive software](#) development.
- [Cable and Parallel Robotics](#) 2005-Current
Analysis, Design and implementation of parallel robots and haptic interfaces based on [Delta](#) and 2RT structures and over-constrained and suspended cable driven manipulators.
- [Surgical Robotics](#) 2008-Current
Development of high-fidelity force feedback eye surgery robot ([Diamond](#)) , and ARAS Haptic System for Eye Surgery Training: [ARASH-ASiST](#).
- [Dynamical Systems Analysis and Control](#) 2002-Current
Robust and Nonlinear observation and control implemented on robotic systems, Brain Computer Interface (BCI), Multi-agent coverage control.
- [Electrical Motorcycle](#) 2002-Current
Design and Implementation of ARAS Robust and Nonlinear observation and control implemented on robotic systems, Brain Computer Interface (BCI), Multi-agent coverage control.

Other Projects @ Robotics Lab, K. N. Toosi U. of Tech.

- [Visual Servoing](#) 2007-2016
Development of vision guided industrial robots to track unmarked objects in space.
- [Adaptive Robust Control of Hard Disk Drives](#) 2003-2010
Design of extra precision adaptive robust controllers for single- and dual-stage HDD
- [Flexible Joint Robots](#) 1993-2007

Design and implementation of composite H_∞ , composite QFT, Nonlinear H_∞ , and supervisory control schemes on FJR to avoid actuator saturation.

- [Cybernetics Robotics](#) 2003-2008
Modeling and Control of artificial arm prosthesis based on acquired and classified neuro-cybernetic signals (EMG).
- Robotics Lab**, Center for Intelligent Machines ([CIM](#)), [McGill](#). 1993-1997
Implementation of [robust \$H_\infty\$ torque control of harmonic drive systems](#) through [intelligent built-in torque sensor developed for harmonic drives](#).
- International Submarine Engineering Ltd**, BC, Canada 1995-1996
Subcontract to STEAR project; modeling, parameter identification and robust torque control of a robot joint actuated with harmonic drive.
- Ambulatory Robotics Lab**, [CIM](#), [McGill](#) 1991-1993
Design and implementation of an under-actuated one-legged hopping robot and developing stabilizing control strategies implemented on the robot.

Teaching Experience:

- [Undergraduate Courses:](#) 1997-current
Introduction to EE, Signals and systems, linear control, modern control, industrial control, instrumentations, digital control, principles of nonlinear control at K.N. Toosi U. of Tech, control engineering at [McGill](#) University (1996).
- [Graduate Courses:](#) 1997-current
Nonlinear control, robust H_∞ control, robotics, parallel robots, digital control, linear system theory, advanced industrial control, advanced dynamics at K.N. Toosi U. of Tech, and [Robotics](#) at [McGill](#) University (2005).

Supervising Experience:

- [6 Ph.D. Graduates, and 6 Ph.D. Students](#) 2000-current
- [96 M.Sc. graduates, and 16 M.C. students](#) 1997- current
- [92 B.Sc. graduates, and 4 B.Sc. students](#) 1997- current

Workshops and Summer Schools:

- [Deep Learning for Self Driving Cars, ICRoM'17](#), Tehran University 2017
- [Robotics Workshop, Khazar University](#), Baku, Azerbaijan 2015
- [Summer school on Parallel Robots: Dynamics and Control](#), University of Tehran 2015
- [Robotic Equipment in Eye Surgery: Ophthalmic Engineering, Farabi Annual Meeting, Tehran U of Medical Science](#) 2015
- [Autonomous Mobile Robots: SLAM, ICROM'13](#), Sharif University, Tehran 2013
- [KNTU CDRPM, from need to implementation, McGill University](#), Montreal 2010
- [Mobile Robot design as a Mechatronic Product, ICCE'08](#), Tehran 2008
- [Mechatronic design of a dual stage hard disk drive, ICME'06](#), Tehran 2006
- [Analysis and design of \$H_\infty\$ and QFT control, ICEE'98](#), Tehran 1998
- [Robot evolution, the development of Antrobotics](#), Zahedan, Iran 1997
- [H \$\infty\$ control in practice; McGill University](#), Montreal 1995

Positions and Occupations:

- [K. N. Toosi U. of Tech.](#), [Vice-Chancellor for Global Strategies and International Affairs](#) 2018-current
- [Concordia University](#), Montreal, Visiting Professor Summer 2017
- [K. N. Toosi U. of Tech.](#), Member of Auditorial Board 2014-current
- [Faculty of Electrical Engineering](#), Dean 2013-2018
- [Ministry of SRT](#), Department of Educational Planning , Head of Multidisciplinary Group 2014-2016
- [International Conference on Robotics and Mechatronics](#), Member of the steering committee 2013-current
- [IEEE Control System Group](#) Chair, [Iran Section](#) 2013-2019
- IEEE Senior member of [Control System](#), and [Robotics and Automation](#) Societies 2012-current
- Industrial Control Center of Excellence, K. N. Toosi U. of Tech. Member of the board 2011-2019
- [Robotics Society of Iran](#), Tehran, Member of the board 2011-2017
- [International Journal of Robotics](#), Editorial board 2010-current
- [ETS University](#), [Control and Robotics Lab](#), Montreal, Visiting Professor Summer 2010
- Iranian Society of Mechatronics, Tehran, Vice President and member of the board 2007-2011
- [K.N. Toosi U. of Tech](#), Tehran, Director of the [Office of International Scientific Cooperation \(OISC\)](#) 2007-2010
- [McGill University](#), [Center for Intelligent Machines](#), Montreal, Visiting Professor 2005-2006
- Iranian Society of Mechatronics, Tehran, Member of the board 2004-2007
- IEEE member, [Control System](#), and [Robotics and Automation](#) Societies 1995-2012
- K.N. Toosi U. of Tech, Tehran, Director of the Department of Systems and Control 2003-2005
- K.N. Toosi U. of Tech, Tehran, Professor. 2010-current
- K.N. Toosi U. of Tech, Tehran, Faculty of ECE, Dean of Research. 1999-2001
- K.N. Toosi U. of Tech, Tehran, Faculty of ECE, Director of Industrial Control Lab [and Robotics Lab](#) 1997- current
- [Advanced Robotics and Automated Systems \(ARAS\)](#), Director of Electrical Engineering Dept. 1997- current

Awards:

Best university professor prize, teaching	2016
Best university professor prize, author of books	2014
Best university professor prize, research	2013
Best university professor prize, teaching	2010
Quebec Merit Fellowship	2005
Best university professor prize, teaching	2002
Best university professor prize, research	2001
J.C. McConnell Memorial McGill Major Fellowship	1995-97
The most prestigious award offered only to top 5% of the students in each department; for 3 years.	
David Stewart Memorial McGill Major Fellowship, one year	1993
Faculty of Graduate Studies, McGill University, Four tuition fee waivers.	1992-94
Ministry of Culture and Higher Education Scholarship	1991
The third-best/600 student in competitive examination for continuing education abroad; six-year scholarship	

Publications:

5 books, and over 200 peer-reviewed publications. Visit <https://aras.kntu.ac.ir/publications/>

Books:

1. Hamid D. Taghirad, [*Parallel Robots: Mechanics and Control*](#), CRC press, Taylor and Francis LLC, 2013.
2. Hamid D. Taghirad, Mohammad Fathi and Farina Zamani Osgouei, [*Robust \$H_\infty\$ Control*](#), K.N. Toosi University Publication, 2014 (In Persian)
3. Hamid D. Taghirad and S. Ali Salamati, [*Fundamentals of Measurements in Instrumentation*](#), K.N. Toosi University Publication, 2nd Edition, 2014 (In Persian).
4. H.D. Taghirad [*An Introduction to Modern Control*](#), K.N. Toosi University of Technology Publication, 3rd Edition, 2013 (In Persian).
5. H.D. Taghirad, [*An Introduction to Industrial Automation and Process Control, with Presentation of Siemens Step7 PLC, 2nd Edition*](#), K.N. Toosi University of Technology Publication, 2012 (In Persian).

Selected Journal Papers:

1. S. A. Khalilpour, R. Khorrambakht, H. D. Taghirad, Philippe Cardou, [*Robust cascade control of a deployable cable-driven robot*](#), Mechanical Systems and Signal Processing, 2019.
2. Ali Noormohammadi-Asl, Hamid D Taghirad, [*Multi-Goal Motion Planning Using Traveling Salesman Problem in Belief Space*](#), Information Sciences, 2019.
3. Reza Babaghasabha, Mohammad A Khosravi, Hamid D Taghirad, [*Adaptive robust control of fully constrained cable robots: singular perturbation approach*](#), Nonlinear Dynamics, 2016.
4. Arsalan Rahimabadi, HD Taghirad, [*Corner stability in nonlinear autonomous systems*](#), Nonlinear Dynamics, 2015
5. M. A. Khosravi and H. D. Taghirad, [*Dynamic Modeling and Control of Parallel Robots With Elastic Cables: Singular Perturbation Approach*](#), in IEEE Transactions on Robotics, July. 2014.
6. A. Norouzzadeh Ravari and H.D. Taghirad, [*3D Scene and Object Classification Based on Information Complexity of Depth Data*](#), International Journal of Robotics: Theory and Applications, 4(2) 28-35, Sept. (2015).
7. H. D. Taghirad and Y.B. Bedoustani, [*An Analytic-Iterative Redundancy Resolution Scheme for Cable-Driven Redundant Parallel Manipulators*](#), in IEEE Transactions on Robotics, Dec. 2011.
8. N. Poursafar, H.D. Taghirad, and M. Haeri, [*Model predictive control of nonlinear discrete time systems: An LMI approach*](#), IET Control Theory and Applications, Vol. 4, No. 10, pp. 1922-32, 2010.

Selected Conference Publications:

1. A. Iranfar, M. Motaharifar, H. D. Taghirad , [*A Dual-User Teleoperated Surgery Training Scheme Based on Virtual Fixture*](#), 6th RSI International Conference on Robotics and Mechatronics (ICRoM), 2018.
2. Omid Esrafilian, Hamid D Taghirad, [*Autonomous flight and obstacle avoidance of a quadrotor by monocular SLAM*](#) Robotics and Mechatronics (ICROM), 2016 4th International Conference on, 2016.
3. A. Khorasani, S. Gholami and H. D. Taghirad, [*Optimization of KNTU Delta robot for pick and place application*](#), Third RSI International Conference on Robotics and Mechatronics (ICRoM 2015), 2015.
4. M. A. Khosravi and H.D. Taghirad, [*Dynamic Analysis and Control of Fully-Constrained Cable Robots with Elastic Cables: Variable Stiffness Formulation in Cable Driven Parallel Robots*](#), Springer, the Second International Conference on Cable Robots, Essen, Germany, pp 160-177, Sept. 2014.
5. N. Marhemati, H. Taghirad and K. Khossousi, [*Monte Carlo Sampling of Non-Gaussian Proposal Distribution in Feature-Based RBPF-SLAM*](#), Australasian Conference on Robotics and Automation ACRA'12, Wellington, New Zealand, Dec. 2012.
6. M. A. Khosravi and H.D. Taghirad, [*Experimental Performance of Robust PID Controller on a Planar Cable Robot*](#), in Cable Driven Parallel Robots, Springer, the proceedings of the First International Conference on Cable Robot, Stuttgart, Germany, pp 337-352, Sept. 2012.