

# MUHAMMAD TAHIR KHAN

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## EDUCATION

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- 2010**            PhD, University of British Columbia, Canada
- 1999**            MEng Mechatronics, University of New South Wales, Australia.
- 1997**            BSc Mechanical Engineering, NWFP University of Engineering and Technology, Pakistan.

## RESEARCH INTERESTS

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- Robotics Cooperation and Control
- Fault Detection and Isolation
- Intelligent Controls and Automation
- Soft Computing

## WORK EXPERIENCE

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- May. 2020-ToDate**            **Chairman Department of Mechatronics Engineering, University of Engineering & Technology, Peshawar, Pakistan**
- June. 2018-May. 2020**        **Director Continuing Engineering Education Center and Technology & Business Incubation Center University of Engineering & Technology, Peshawar, Pakistan.**
- May. 2016-To Date**            **Professor Department of Mechatronics Engineering University of Engineering & Technology, Peshawar, Pakistan.**
- July. 2014-May 2016**        **Associate Professor Department of Mechatronics Engineering University of Engineering & Technology, Peshawar, Pakistan.**
- Jun. 2002-July 2014**        **Assistant Professor Department of Mechatronics Engineering University of Engineering & Technology, Peshawar, Pakistan.**
- Feb. 2010-Feb 2012**        **Lab Manager and Post-Doctoral Fellow Industrial Automation Laboratory University of British Columbia, Canada**
- Nov. 1999-May. 2002**        **Lecturer Department of Mechanical Engineering NWFP University of Engineering & Technology, Pakistan.**

## GRANTS

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- 2018 *National Center of Robotics and Automation*, Higher Education Commission Rs. 80 million approx. (US\$ 0.65 million) – Principal Investigator
- 2017 *Commercialization of Indigenously developed precession Seed Planter*, Directorate of Science and Technology, Government of Khyber Pakhtunkhwa. Rs. 30 million (US\$ 0.25 million) – Principal Investigator
- 2015 *RFID based Patient Tracking System*, Directorate of Science and Technology, Government of Khyber Pakhtunkhwa. Rs. 0.7 Million (US\$ 65000) – Principal Investigator

## CONFERENCE RESPONSIBILITIES

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- 23rd Canadian Congress of Applied Mechanics, 2011, Vancouver, BC, Canada – *Local Arrangement Chair*
- The IASTED International Conference on Engineering and Applied Science, 2012, Colombo, Sri Lanka – *Program Chair*
- The 9th IEEE International Conference on Computer Science & Education, 2014, Vancouver, BC, Canada – *Organizing Chair*
- The 2nd International Conference on Robotics and Artificial Intelligence, 2016, Rawalpindi, Pakistan – *Conference Co-Chair*

## EDITORIAL RESPONSIBILITIES

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- Mechatronics Systems and Control Journal – *Editor*
- Special Issue on Control and Intelligent Systems – Design and Applications – *Guest Editor*
- Special Issue on Control and Intelligent Systems- soft computing and applications - *Guest Editor*

## SELECTED PUBLICATIONS

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*Below is the list of selected publications. Complete list is available on request*

- **Selected International Conference Publication List**

**M. T. Khan**, M. I. Saleem and S. Khan, "Multi-Human-Multi-Robot Facial Interaction System," *2018 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT)*, Sakhier, Bahrain, 2018, pp. 1-6.

G. Sikander, S. Anwar and **M. T. Khan**, "Non intrusive selective facial feature tracking: A fuzzy control approach," *2018 5th International Conference on Electrical and Electronic Engineering (ICEEE)*, Istanbul, 2018, pp. 394-398.

A. Abid, **M. T. Khan**, A. Ullah, M. Alam and M. Sohail, "Real time health monitoring of industrial machine using multiclass support vector machine," *2017 2nd International Conference on Control and Robotics Engineering (ICCRE)*, Bangkok, 2017, pp. 77-81

K. Iftikhar and **M. T. Khan**, "Resource sharing and deadlock avoidance in multi robot systems using Market Based Approach," *2016 IEEE 7th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON)*, Vancouver, BC, Canada, Oct 13-15 2016, pp. 1-7

**Khan, M.T.**; Qadir, M.U.; Nasir, F.; de Silva, C.W., "A framework for a fault tolerant multi-robot system," in *Computer Science & Education (ICCSE), 2015 10th International Conference on* , Cambridge, UK, pp.197-201, 22-24 July 2015

Abid, A.; **Khan, M.T.**; de Silva, C.W., "Fault detection in mobile robots using sensor fusion," in *Computer Science & Education (ICCSE), 2015 10th International Conference on* , Cambridge, UK, pp.8-13, 22-24 July 2015 (**Best Student Paper Award**)

**Khan, M.T.**; Izhar; Nasir, F.; Qadir, M.U.; Iqbal, J., "Artificial immune system based framework for multi-robot cooperation," *Computer Science & Education (ICCSE), 2014 9th International Conference on* , Vancouver, Canada., pp.50,55, 22-24 Aug. 2014

**Khan, M.T.**; Hussain, S.; Bakhtair, S.; Khan, A.Z.; Javed, S.; Iqbal, J., "Fault detection in robot sensors using negative selection algorithm," *Computer Science & Education (ICCSE), 2014 9th International Conference on* , Vancouver, Canada., pp.38,43, 22-24 Aug. 2014

**Muhammad T Khan**, Clarence W. de Silva, Afzal Khan, "Auction-Based Fault-Tolerant Multi-Robot Cooperation" *IASTED International Conference on Engineering and Applied Science*, Colombo Sri Lanka, Dec 27-29, 2012

**Muhammad Khan**, Saeed Behbahani, Quinn Hsu, Jerome Li and Clarence De Silva "Optimized Dynamic Task Allocation in Cooperative Multi-Robot Search and Rescue Operation" *23rd Canadian Congress of Applied Mechanics (CANCAM'11)*, Vancouver, Canada June 5-9, 2011

**M. Tahir Khan** and C.W. de Silva, "Robust Multi-Robot Cooperation Using Idiopathic Immune System Approach," *ASME International Mechanical Engineering Congress & Exposition*, Vancouver, Canada, November 2010

**M. Tahir Khan** and C.W..de Silva, "Autonomous Market-Based Multi-Robot Cooperation," *The third int.conf. on intelligent and advanced systems*, Kuala Lumpur, Malaysia, June 2010

**M. Tahir Khan** and C.W. de Silva, "Immune System-Inspired Dynamic Multi-Robot Coordination," *ASME/IEEE International Conference on Mechatronics and Embedded Systems and Applications*, pp 37-43, San Diego, USA, August 2009

**M.T Khan** and C.W. de Silva, "Autonomous Fault Tolerant Multi-Robot Coordination for Object Transportation Based on Artificial Immune System" *Second International Conference on Robot Communication and Coordination.*, pp 1-6, Odense, Denmark March 2009.

**M. T. Khan** and C.W. de Silva, "Autonomous fault tolerant multi-robot cooperation using artificial immune system," *Proc of IEEE International Conference on Automation and Logistics, 2008. ICAL 2008* pp 623-628 Qingdao, China September 2008

- **Journal Publication List**

- **Selected International Journals Publications**

A. Abid, **M. T. Khan**, I. U. Haq, S. Anwar & J. Iqbal “An Improved Negative Selection Algorithm-Based Fault Detection Method”, *IETE Journal of Research*, 2020, accepted for publication

Tufail Muhammad, Shahzad Anwar, Zubair Ahmad Khan, and **Muhammad Tahir Khan**. "Real-Time Impedance Control Based on Learned Inverse Dynamics." *Arabian Journal for Science and Engineering* vol. 45, 2020, pp. 5043 - 5055.

Abid, **M. T. Khan** and M. S. Khan, "Multidomain Features-Based GA Optimized Artificial Immune System for Bearing Fault Detection," in *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 50, no. 1, pp. 348-359, Jan. 2020.

Z.A. Khan, **M T Khan**, I U Haq, J Iqbal and M Tufail, “Human immune system inspired framework for disruption handling in manufacturing Process,” *International Journal of Computer Integrated Manufacturing*, vol. 32, no. 11, pp. 1081-1097, Nov, 2019

A. Abid, **M. T. Khan**, H. Lang and C. W. de Silva, "Adaptive System Identification and Severity Index-Based Fault Diagnosis in Motors," in *IEEE/ASME Transactions on Mechatronics*, vol. 24, no. 4, pp. 1628-1639, Aug. 2019.

Zubair Ahmad Khan, **Muhammad Tahir Khan**, Izhar Ul Haq & Kamran Shah “Agent-based fault tolerant framework for manufacturing process automation”, *International Journal of Computer Integrated Manufacturing*, vol 32, no 3, 2019 pp, 268-277

A. Abid, **M. T. Khan** and C. W. de Silva, "Layered and Real-Valued Negative Selection Algorithm for Fault Detection," in *IEEE Systems Journal*, vol. 12, no. 3, pp. 2960-2969, Sept. 2018

H. Lang, **M.T. Khan**, K.-K. Tan, C.W. de Silva, “Application of Visual Servo Control in Autonomous Mobile Rescue Robots”, *International Journal of Computers Communications & Control*, Vol. 11, No. 5, 2016, pp. 668-680

**M. Tahir Khan**, M. Qadir, A. Abid, F.Nasir, C. W. de Silva;, “Robot Fault Detection Using an Artificial Immune System” *Control and Intelligent Systems*, Vol. 43, No. 2, 2015, pp. 107-117

**Muhammad T. Khan**, Izhar, Fazal Nasir, Muhammad U. Qadir, and Clarence W. de Silva. “Multi-robot Cooperation Framework Based on Artificial Immune System” *Control and Intelligent Systems*, Vol. 43, No. 3, 2015, pp. 159-167

**M. Tahir. Khan**, and Clarence W. de Silva, “Autonomous and Market-Based Fault Tolerant Algorithms for Multi-Robot Cooperation” *Journal of Information Science and Engineering* Vol. 30, No. 2, 2014, pp. 483-500

**M. Tahir Khan**, Bessie Chan, Afzal Khan, Zia Haq, Javaid Iqbal, “Optimized Dynamic Task Allocation and Priority Assignments in an Immunized Autonomous Multi-Robot Search and Rescue Operation” *Romanian Journal of Information Science and Technology* Vol. 15, No. 2, 2013, pp. 129-145

Lang, Haoxiang, **Muhammad Tahir Khan**, Kok-Kiong Tan, and Clarence W. de Silva. "Developments in visual servoing for mobile manipulation." *Unmanned Systems* 1, no. 01 (2013): 143-162.

**Muhammad T. Khan**, and Clarence W. de Silva, "Multi-Robot Cooperation Using an Immune System Model for Multi-Object Transportation" *International Journal of Robotics and Automation*, Vol. 28, No. 1, 2013, pp. 42-56

**Muhammad T. Khan**, and Clarence W. de Silva, "Autonomous and Robust Multi-Robot Cooperation Using an Artificial Immune System," *International Journal of Robotics and Automation*, Vol. 27, No. 1, 2012, pp. 60-75

Mayank Baranwal, **M. Tahir. Khan**, and Clarence W. de Silva, "abnormal motion detection in real time using video surveillance and body sensors" *International journal of Information Acquisition*, Vol 8. N0. 2, 2011, pp. 103-116