

# Mun Sang Kim

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## Education

- Technical University of Berlin Berlin, Germany, Dr.-Ing,(1983-1987)
- Seoul National University Seoul, Korea Master of Science (1980-1982)
- Seoul National University Seoul, Korea Bachelor of Science (1976-1980)

## Research area

- sensor application to industrial robots, design and control of human like robots and novel mobile manipulation systems for indoor and outdoor usage

## Experience

- **Director of 21 C Frontier Program “Center for Intelligent Robotics”(2003.10~Present)**
- Intelligent robotics center KIST, Head (1987-2003)
- Univ. of Michigan / Perception Inc./ Ann Arbor Michigan, USA / Visiting Professor / Senior software engineer (1996.09-1997.08)
- Institute fuer Produktionstechnik und Konstruktionsanlagen / Belin,Germany / Research Scientist (1983.08-1987.03)
- Korea Institute of Science and Technology / Seoul, Rep.Of korea (1982.10-1983.04)
- Waseda University Global COE Adjunct Professor since 2008
- Korea University, Adjunct Professor since 1998

## Awards

- Prize of Research and Development (1990)
- “Robot Performance test and Calibration System”,Ministry of Science and Technology
- IR52 Chang Young-Sil Prize (1991)
- “Stud Welding robot system ” ,Ministry of Science and Technology”
- Prize of excellent industrialization project (1991)
- “Automation of Shock Absorber Assembly line using industrial Robots ” ,KIST
- Prize of excellent research team of the year KIST (1992)
- The best paper of the year “Prize of Baek-am” (1992)
- “The Development of Robot Off-line programming system for Die Polishing”, Korea Society of Mechanical Engineering
- Prize of the best contributed researcher (1994)
- “The Kumdori sculpturing robot for ‘93 Daejon EXPO”, KIST
- IR52 Chang Young-Sil Prize (1994)
- “3-dimensional car body inspection robot ”,Ministry of Science and Technology
- 94 korea industry medal (1994)
- “The Kumdori sculpturing robot for ‘93 Daejon EXPO”,The President of Korea Government

- Prize of the best contributed researcher of the month (1999) “ Human Robot Centaur “, KIST President
- NewTech Korea (2002), Field Robot "Robhaz", “ MOICE Minister Award” awarded to KIST
- Prize of the best contributed researcher of the month (2003) “Frontier 21 program director“, KIST President
- Outstanding Paper Award, In 2003 International Conference on Control, Automation, and Systems (2003)
- Outstanding Paper Award “Development of User Friendly Control Method for the Robot “Robhaz-DT2”, KIMST 2004
- ICASS2005 Best Paper Award “ROBHAZ-DT3 : Rough-Terrain Negotiable Teleoperated Mobile Robot for Rescue & Military Mission (2005)

## Consulting & Activities

### Consulting

- Technical Consultant for Daewoo Group Factory automation Area (1992)
- Technical Consultant for Hyundai Motor Company Robotic Application Area (1995-1996)
- KIST R&D Academy Professor since 2003
- KIST Academy-Research Course committee member
- Technical Consultant for Hyundai Rotem Inc. since 2009

### Academy

- International Symposium on intelligent Robotics “ General chair COEX, 2004/11/30
- IROS2005, ASIA Program Chair,
- IARP Workshop HUDEM, RISE, 등 organizing committee since 2006
- 2006 Korea Japan International Workshop General Chair
- 2005-2008 Frontier-Waseda Joint Workshop Korea General Chair
- 2007 ICAR Conference Organizing Chair
- ISPRM 2007 Invited Talk : Challenged to Robot Intelligence
- ICAR 2007 Planery Talk
- ROMAN 2007 Invited Talk
- UKC 2007 Invited Talk
- Lecture Notes:“Recent Progress in Robotics:Viable Robotic Service to Human" 2007, Editor
- Journal of Intelligent Service Robotics Editor since 2008
- ICASS-SICE International relations co-chair since 2008
- CIRA2009 Plenary Talk
- 2010 ROSEC Winter School 특별강연
- 2010 IEEE ARSO General Chair
- 2010 Waseda-SSSA-KIST General Chair
- OECD IARP Korea Representative since 2006
- Korea-Germany Association deputy director since 2008
- 미국 CMU 대학에 프론티어 지원 KIST Local Lab. 설치 2007
- 일본 Waseda 대학 Global COE 위촉 교수 since 2008
- Italy Waseda-SSSA-KIST Summer School 한국 Organizer

## Recent Publications

### Book

1. “Improvement of robot absolute positioning accuracy by parameter identification method”  
Dissertation, Springer Verlag, 1987

2. "Robot Story", Salim Publishing Company ,2005/06
3. Chung-Kyu Woo, Hyun Do Choi, Mun Sang Kim, Soo Hyun Kim, Yoon Keun Kwak, "Climbing & Walking Robots Towards New Applications.", I-Tech Education and Publishing, Chapter "Optimal Design of a New Wheeled Mobile Robot by Kinetic Analysis for the Stair-Climbing States, 2006
4. co-Editor "Recent Progress in Robotics: Viable Robotic Service to Human", Springer Verlag, 2008

### International Journal(from 1998-)

1. Sungchul Kang, Yong K. Hwang, **Mun S. Kim**, Kyo I. Lee and Chong W. Lee, "A Compliant Controller Dynamically Updating the Compliance Center by Contact Localization", Robotica, Vol 16, part 5, pp.543-550, Sept 1998. SCIE
2. Yonghwan Oh, Wan Kyun Chung, Youngil Youm and **Munsang Kim**, "Hybrid Impedance Control of Redundant Manipulators: an Approach to Decouple Task Space and Null Space Motions", Intelligent Automation and Soft computing, Vol5. No.2, pp 149-164, 1999, SCIE,corresp.
3. S. Lee, **M. Kim**, C-W. Lee, "Human and Robot Integrated Teleoperation", Advanced Robotics Journal, Vol. 13, No. 4, 1999, SCIE
4. C.Y.Chung, B.H. Lee, **M.S. Kim** and C.W.Lee, "Torque Optimizing Control with Singularity-Robustness for Kinematically Redundant Robots, Journal of Intelligent and Robotics Systems, 00: 1-28, 2000, SCI, Kluwer Academic Publishers,corresp.
5. **Munsang Kim**, Kyoungrae Cho, Bum-jae You, Chong-won Lee, "Task Planning for humanoid robots using look-up table", Journal of Robotics and Autonomous Systems 996(2002) 1-8, Kluwer Academic Publishers, SCIE,corresp.
6. Taehun Kang, Hyoukryeol Choi, **Munsang Kim**, "Development of Anthropomorphic Robot Hand SKK Robot Hand I", pp230-238, KSME International Journal, Feb. 2003, SCIE,corresp. 미입력
7. Kyoungrae Cho, **Munsang Kim** and Jae-bok Song "Complete and Rapid Regrasp Planning with Look-up Table", Journal of Intelligent and Robotic Systems 1-17, pp371-387, 2003, SCIE, corresp.
8. Cheong Hee Lee, Soo Hyun Kim, Sung Chul Kang, **Mun Sang Kim**, Yoon Keun Kwak, "Double Track Mobile Robot for Hazardous Environment Applications", Advanced Robotics, Vol. 17, No.5, pp.447-459, 2003, SCIE, The International Journal of the Robotics Society of Japan,cooresp.
10. Changhyun Cho, **Munsang Kim**, and Jae-Bok Song, "Direct Control of a Passive Haptic Device Based on Passive Force Manipulability Ellipsoid Analysis," Int. J. of Control and Automated systems, vol. 2, pp. 238-236, 2004
11. Jaehyoung Lee, **Woojin Chung**, Munsang Kim and Jaebok Song " A passive multiple trailer system with off-axle hitching" International Journal of Control, Automation and Systems, vol2, No3, pp289-297, SCIE
12. Woojin Chung, Gunhee Kim and **Munsang Kim** " Development of range sensor based integrated navigation system for indoor service robot" Journal of Control, Automation and Systems. Vol. 10, No. 9, pp.785-798, Sept. 2004
13. Yoon Sang Kim, Jangwook Lee, Sooyong Lee, **Munsang Kim**, "A Force Reflected Exoskeleton-Type Masterarm for Human-Robot Interaction" IEEE Transations on Systems, Man and Cybernetics-Part A: Systems and Humans, Vol. 35, No. 2, March 2005, SCI, corresp.
14. C. Cho, W. Lee, S. Kang, **M. Kim** and J.-B. Song," Uneven terrain negotiable mobile platform with passively adaptive double tracks and its application to rescue missions", Advanced Robotics vol. 19, No. 4, pp.459-475(2005),SCIE
15. Changhyun Cho, Jae-Bok Song Munsang Kim, "Design and Control of a planar Haptic Device with Passive Force Manipulability Ellipsoid(FME) Analysis, Journal of Robotic Systems 22(9), 475-486(2005), 미입력
16. Changhyun Cho, Sungchul Kang, **Munsang Kim**, Jae-Bok Song, "Macro-Micro Manipulation with Visual Tracking and its Application to Wheel Assembly", International Journal of Control, Automation, and Systems, September 2005 Vol.3 Number 3, SCIE
17. S. Yoon, S. Kang, S. Yun, S. Kim, Y. Kim, M. Kim, „Safe Arm Design with MR-based Passive Compliant Joints and Visco-elastic Covering for Service Robot Applications“, Journal of Mechanical Science and Tehchnology(KSME Int. J.) Vol.19, No. 10, pp1835-1845, 2005 ,SCIE
18. D. Ryu, C. Hwang, S. Kang, M. Kim, J. Song, "Teleoperations of Field Mobile Manipulator with Wearable Haptic-based Multi-Modal User Interface and Its Application to Explosive Ordnance Disposal“, J. of

- Mechanical Science and Technology, (KSME Int. J.), Vol.19, No. 10, pp1864-1874, 2005,SCIE
19. Changhyun Cho, Woosub Lee, Sungchul Kang, Munsang Kim, and Jae-Bok Song, "Uneven Terrain Negotiable Mobile Platform with Passively Adaptive Double-Tracks and Its Application" *Advanced Robotics*, Vol. 19, No. 4, pp. 459 – 475, April 2005,SCIE
  20. S. Lee, J. Kim, F.C. Park, **Munsang Kim**, Bobrow, J.E. "Newton-Type Algorithms for Dynamics-Based Robot Movement Optimization", *IEEE transactions on robotics : a publication of the IEEE Robotics and Automation Society*, 200508, 21(4),, 657~667, SCI, corresp.
  21. Jaehyung Lee, Changhyun Cho, **Munsang Kim**, and Jae-Bok Song, " Haptic interface through wave transformation using delayed reflection: application to a passive haptic device," *Advanced Robotics*, vol. 20, no. 3, pp. 305-322, 2006.SCIE
  23. Woojin Chung, Gunhee Kim, **Munsang Kim**, "Development of the multi-functional indoor service robot PSR systems", *Autonomous Robots* Vol32, No5, Part2, pp223-233, 200612, SCI, corresp.
  24. Sungchul Kang, Chanhyun Cho, Chanwoo Park, Munsang Kim, "ROBHAZ-DT2 : Passive Double-Track Mobile Manipulator for Explosive Ordnance Disposal", *Field and Service Robotics*, ISSN 1610-7438, Vol.24, Part.8, pp355-364, 2006-09
  25. S. Kang, C. Cho, C. Park, C. Lee, D. Ryu, **M. Kim**, "ROBHAZ-DT2 : Passive Double-Track Mobile Manipulator for Explosive Ordnance Disposal", *Advanced robotics : the international journal of the Robotics Society of Japan* 200609, SCIE
  26. Sung Chul Kang, Munsang Kim, Sinsuk Park, "Adaptive Accommodation Control Method for Complex Assembly", *JSME international journal. Series C, Mechanical systems, machine elements and manufacturing*, ISSN1344-7653, Vol.49. No.4, pp994-1002. 2006-12 SCI
  27. Changhyun Cho, Jae-Bok Song, and **Munsang Kim**, "Energy-Based Control of a Haptic Device Using Brakes", *IEEE Transactions on Systems, Man, and Cybernetics-Part B: Cybernetics*, Vol. 37, No. 2, April 2007, pp341-349, SCI, Corresp.
  28. Hyun Don Kim, Jong-Suk Choi, Munsang Kim, "Human-Robot Interaction in Real Environments by Audio-Visual Integration", *International Journal of Control, Automation and Systems*, ISSN1598-6446, Vol5, No.1, pp61-69, 2007-02 SCIE
  29. Woojin Chung, Gunhee Kim, **Munsang Kim**, "Development of the multi-functional indoor service robot PSR systems", *Autonomous Robot*(2007) 22;1-17, DOI 10.1007/210514-006-9001-z, Springer Verlag, SCI, Corresp.,
  29. Changhyun Cho, Jae-Bok Song, and **Munsang Kim**, " Stable Haptic Display of Slowly Updated Virtual Environment with Multirate Wave Transform", *IEEE-ASME Transactions on Mechatronics*, Vol. 13, No. 5, October, 2008, pp 566-575, SCI, corresp
  30. Dong Suk Rhy, Jae Bok Song, Sungchul Kang, **Munsang Kim** , "Frequency Domain Stability Observer and Active Damping Control for Stable Haptic Interaction", *IET control theory and applications*, 200804, SCI
  31. SeungKook Yun, Sung Sik Yun, Sungchul Kang, Munsang Kim, "Design and Vibration Control of Safe Robot Arm with MR-Based Passive Compliant Joint", *Journal of System Design and Dynamics*, 200812,
  32. Minseong Kim, Suntae Kim, Sooyong Park, Mun-Taek Choi, Munsang Kim, and Hassan Gomaa, "Service Robot for the Elderly", *IEEE Robotics & Automation Magazine*, pp34-45, Vol.16, No.1, ISSN 1080-9932, March 2009
  33. S. Jin, J. Cho, X. D. Pham, K. M. Lee, S.-K. Park, M. Kim, and J. W. Jeon, "FPGA Design and Implementation of a Real-Time Stereo Vision System", *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY*, VOL. 20, NO. 1, JANUARY 2010
  34. Dongseok Ryu, Jae-Bok Song, Changhyun Cho, Sungchul Kang, Munsang Kim, "Development of a Six DOF Haptic Master for Teleoperation of a Mobile Manipulator, *Mechatronics*," Vol. 20, No. 2, pp. 181-191, 2010.03.