CURRICULUM VITAE

Farzam Farahmand
Professor of Biomechanics and Biomedical Robotics

Mechanical Engineering Department
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Educational Background

- PhD in Biomechanical Engineering, Imperial College of Science and Technology and Medicine, London, UK, 1992-96.
- MSc in Mechanical Engineering, University of Tehran, Tehran, Iran, 1989-91.
- BSc in Mechanical Engineering, University of Tehran, Tehran, Iran, 1984-89.

Professional Background

- Professor, Mechanical Engineering Department, Sharif University of Technology, 1997-present.
- Executive Positions in University:
  - Director of Djavad Mowafaghian Research Center for Intelligent Neuro-Rehabilitation Technologies (DMRCINT), 2014- present
  - Director of Intellectual Property Office, 2015- present
  - Deputy Director of Technology, 2017-2022
- Executive Positions in Department:
  - Head of the Biomechanics Section, 1998-present
  - Chairman, 2005-09
  - Vice Chairman on Research, 2001-03

Other Professional Activities and Affiliations

- Member of Scientific Societies: International Society of Biomechanics, Iranian Society of Biomedical Engineers, Computer Assisted Orthopedic Surgery (CAOS)
- Member of Editorial Board: International Journal of Medical Robotics and Computer Assisted Surgery, Frontiers in Biomedical Technology, Sport Biomechanics, Journal of Iranian Society of Biomedical Engineers
- Member of Biomedical Engineering Board, Ministry of Health and Ministry of Science, Research and Technology
- Member of Board of Sharif Technology Park (Sharif Univ of Tech) and Medical Device Incubation Center (Tehran Univ of Med Sci)

- Member of Interdisciplinary Research Committee, Iran National Science Foundation
- Co-Founder and Member of Board of Innovation-Driven Companies: Sina Robotics & Medical Innovators (SinaMed) in Surgical Robotics, Parse Intelligent Surgical Systems (Parsiss) in surgical navigation systems, Pajouhandegan Pegah Parse in robotic and intelligent rehabilitation systems, Fanavan Jarahyar Sharif in patient-specific instruments, Avin Medical Implants in patient-specific implants

Awards and Achievements

- Sheykh-Mofid Award, Iran's National Elites Foundation, 2024.
- Best Professor Award, Ministry of Science, Research and Technology, 2023.
- Best Technology Innovation Award, Ministry of Science, Research and Technology, 2022.
- Best Researcher Award, Sharif University of Technology, 2013, 2021.
- Research Chair in Biomedical Robotics, Iranian National Science Foundation, 2012, 2016.
- Razi International Award for BioMedical Research Achievements, 2005, 2013.
- National Innovation Award, Iranian Presidential Office, 2008.
- Kharazmi International Award for Scientific Research Achievements, 2001.

Research Interests

- Orthopedic Biomechanics
- Musculoskeletal Biomechanics
- Robotic and Intelligent Rehabilitation

Recent Publications in Peer-Reviewed Journals (2020-2025)

- Jabbari-Mostahsan A, Farahmand F, Silvayehb Z, Domitnerb J, Influence of process interruption on microstructure and mechanical properties of Ti6Al4V processed by laser powder bed fusion without preheating, Results in Engineering, 26: 104908, 2025.
- Shams Esfand Abadi V, Sadeghnejad S, Rostami M, Farahmand F, FEM modeling of lateral collateral & medial collateral ligaments for use in total knee arthroplasty surgery simulation, Journal of Engineering in Medicine, 239(7): 636-643, 2025.
- Taheri A, Farahmand F, Bahraminasab M, Conceptual design and additive manufacturing of a bidirectional gradient gyroid structure for tibial stem, Annals of Biomedical Engineering, 53: 2932-2948, 2025.
- Parhiz A, Karimpour M, Farahmand F, Damercheli S, Amirzade Iranaq MH, Rehabilitation of mandibulectomy with patient-specific instrument: a case report, Journal of Craniomaxillofacial Research, 12(1): 54-60, 2025.
- Darvishi M, Daroudi S, Tavasoli S, Shafiezadeh A, Farahmand F, Generalizability of motor modules across walking-based and in-place tasks- a distribution-based analysis on total knee replacement patients, Frontiers in Bioengineering and Biotechnology, 13: 1471582, 2025.
- Sheraft-Vaziri A, Moradkhani G, Farahmand F, Karimpour M, Tahmasebi MN, Vosoughi F, Salimi M, Shayan-Moghadam R, Utilizing 3d-printed patient-specific porous titanium cones in complex primary and revision total knee arthroplasty, European Journal of Orthopaedic Surgery & Traumatology, 35(1): 96, 2025.

- Shafizadegan Z, Rasouli O, Sarrafzadeh J, Farahmand F, Salehi R, Lower extremity joint kinematics in individuals with and without bilateral knee osteoarthritis during normal and narrow-base walking: A cross-sectional study, The Knee, 53:126-137, 2025.
- Hosseini SH, Farahmand F, Is it truly impossible to strengthen the vastus medialis in isolation from the entire quadriceps muscle group?, Heliyon, 10 (24): e41012, 2024.
- Hosseini SH, Farahmand F, Effect of two quadriceps strengthening protocols on morphological characteristics of knee vastus muscles in patients with lateral patellar compression syndrome, Journal of Bodywork and Movement Therapies, 40: 726-732, 2024.
- Abedi A, Farahmand F, Zanjani LO, Nabian MH, Effect of geometrical design variables on implantation configuration and fixation stiffness of titling bone anchors: A parametric finite element study, Medical Engineering & Physics, 129: 104191, 2024.
- Mirbagheri SS, Aminian G, Bahramizade M, Dalvand H, Farahmand F, Vahedi M, Design and evaluation of dynamic movement orthosis on functional parameters of gait and occupational performance in a child with spastic diplegia cerebral palsy, Archives of Rehabilitation, 25 (1): 158-179, 2024.
- Ahmadi R, Hosseini-Lorgan SH, Sherafat-Vaziri A, Tahmasebi MN, Shayan-Moghadam R, Farahmand F, Effect of anterior cruciate ligament injury on acceleration response of knee joint, Journal of Engineering in Medicine, 238 (5): 488-499, 2024.
- Taheri A, Farahmand F, Bahraminasab M, Radially and axially graded cellular tibial stems for total knee replacement, International Journal of Mechanical Sciences, 263: 108772, 2024.
- Alimohammadi M, Mirzabozorg H, Farahmand F, Kim S, Baril C, Ploeg HL, Statistical distribution of micro and macro pores in acrylic bone cement- effect of amount of antibiotic content, Journal of the Mechanical Behavior of Biomedical Materials, 150: 106297, 2024.
- Mirbagheri SS, Bahramizadeh M, Aminian G, Dalvand H, Farahmand F, Vahedi M, A case series on the effect of dynamic neoprene orthosis on lower limb kinematic variables in children with cerebral palsy, Journal of Pediatric Rehabilitation Medicine, 17: 131-138, 2024.
- Mehryar P, Shourijeh M, Rezaeian T, Khandan A, Messenger N, O'Connor R, Farahmand F, Dehghani-Sanij A, The impact of different self-selected walking speeds on muscle synergies in transfemoral amputees during transient-state gait, Biomechanics, 4 (1): 14-33, 2024.
- Jamshidifar H, Farahmand F, Behzadipour S, Mirbagheri A, Mechanical design of a 5-DOF robotic interface for application in haptic simulation systems of large-organ laparoscopic surgery, Scientia Iranica, 31(1): 1-14, 2024.
- Abedi A, Pourghazi F, Eslami M, Nabian MH, Ali-Mohammadi AM, Oryadi-Zanjani L, Farahmand F, An additively manufactured titanium tilting suture anchor: a biomechanical assessment on human and ovine bone specimens, Frontiers in Surgery, 10: 1195728, 2023.
- Sadeghnejad S, Khadivar F, Esfandiari M, Amirkhani G, Moradi H, Farahmand F, Vossoughi G, Using an improved output feedback MPC approach for developing a haptic virtual training system, Journal of Optimization Theory and Applications, 98: 745–766, 2023.
- Azghani M, Kian-Bostanabad S, Meghdari A, Parnianpour M, Farahmand F, Normative database of response surface method for human trunk extension in isometric mode, Journal of Engineering in Medicine, 237(7): 855-868, 2023.
- Tavasoli S, Tavasoli M, Shojaeefard M, Farahmand F, Analysis of cerebral palsy gait based on movement primitives, Clinical Biomechanics, 104: 105947, 2023.
- Jabbari Mostahsan A, Farahmand F, Influence of cleaning process on mechanical properties and surface characteristics of selective laser melted Ti6Al4V parts prepared for medical implant applications, Journal of Materials Research, 37(16): 37, 2546-2557, 2022.

- Hayatbakhsh Z, Farahmand F, Karimpour M, Is a complete anatomical fit of the Tomofix plate biomechanically favorable? A parametric study using the finite element method, The Archives of Bone and Joint Surgery, 10 (8): 712-720, 2022.
- Shafizadegan Z, Sarrafzadeh J, Farahmand F, Salehi R, Rasouli O, Uncontrolled manifold analysis of gait kinematic synergy during normal and narrow path walking in individuals with knee osteoarthritis compared to asymptomatic individuals, Journal of Biomechanics, 141: 111203, 2022.
- Hajihosseinali M, Behzadipour S, Taghizadeh G, Farahmand F, Direction-dependency of the kinematic indices in upper extremities motor assessment of stroke patients, Medical Engineering & Physics, 108: 103880, 2022.
- Shafizadegan Z, Sarrafzadeh J, Salehi R, Farahmand F, Rasouli O, The effects of challenging walking conditions on kinematic synergy and stability of gait in people with knee osteoarthritis: A study protocol, Advanced Biomedical Research 11: 35, 2022.
- Darvishi M, Daroudi S, Tavasoli S, Shafiezadeh A, Farahmand F, Baniasad M, Modular analysis of pooled muscle and kinematic data reveals the dynamics of the gait sub-phases, Gait & Posture, 97: S402-S403, 2022.
- Dehestani P, Farahmand F, Borjali A, Bashti K, Chizari M, Bone density may affect primary stability of anterior cruciate ligament reconstruction when organic core bone plug fixation technique used, Journal of Experimental Orthopaedics, 9 (1): 5, 2022.
- Esmaeili S, Karami H, Baniasad M, Shojaeefard M, Farahmand F, The association between motor modules and movement primitives of gait: A muscle and kinematic synergy study, Journal of Biomechanics, 134: 110997, 2022.
- Hayatbakhsh Z, Farahmand F, Effects of plate contouring quality on the biomechanical performance of high tibial osteotomy fixation: A parametric finite element study, Journal of Engineering in Medicine, 236 (3): 356-366, 2022.
- Hoursan H, Farahmand F, Ahmadian MT, Effect of axonal fiber architecture on mechanical heterogeneity of the white matter—a statistical micromechanical model, Computer Methods in Biomechanics and Biomedical Engineering, 25 (1): 27-39, 2022.
- Hojjati-Najafabadi A, Amini S, Farahmand F, Using a saddle-assistive device equipped with mechanical orthosis for walking of the person with incomplete spinal cord injury, Journal of Engineering in Medicine, 235 (7): 735-742, 2021.
- Tavasoli S, Shojaeefard M, Farahmand F, Baniasad M, Kinematic synergy analysis of crouch cerebral palsy gait reveals a reduced locomotor strategy based on movement primitives, Gait & Posture, 90: 263-264, 2021.
- Mehryar P, Shourijeh MS, Rezaeian T, Khandan AR, Messenger N, O'Connor R, Farahmand F, Dehghani-Sanij A, Muscular activity comparison between non-amputees and transfemoral amputees during normal transient-state walking speed, Medical Engineering & Physics, 95: 39-44, 2021.
- Bokaeian HR, Esfandiarpour F, Zahednejad S, Mohammadi HK, Farahmand F, Effects of medial thrust gait on lower extremity kinetics in patients with knee osteoarthritis, Ortopedia, Traumatologia, Rehabilitacja, 23 (2): 115-120, 2021.
- Bokaeian HR, Esfandiarpour F, Zahednejad S, Mohammadi HK, Farahmand F, Effects of an exercise therapy targeting knee kinetics on pain, function, and gait kinetics in patients with knee osteoarthritis: A randomized clinical trial, Adapted Physical Activity Quarterly, 38 (3): 377-395, 2021.
- Hoursan H, Farahmand F, Ahmadian MT, Masjoodi S, Anisotropic finite element modelling of traumatic brain injury: A voxel-based approach, Scientia Iranica, 28 (3): 1271-1283, 2021.

- Hojjati-Najafabadi A, Amini S, Farahmand F, Improving sit-to-stand transition by the saddle-assistive device in the spinal cord injury: A case study, Journal of Engineering in Medicine, 235 (7): 735-742, 2021.
- Aghajani-Fesharaki S, Farahmand F, Saeedi H, Raeissadat SA, Abdollahy E, Amir Ahmadi A, Maroufi N, The effects of knee orthosis with two degrees of freedom joint design on gait and sit-to-stand task in patients with medial knee osteoarthritis, Sultan Qaboos University Medical Journal, 20 (4), 324-331, 2020.
- Hojjati-Najafabadi A, Amini S, Farahmand F, The effect of saddle-assistive device on improving the gait parameters of patients with the lower limbs weakness: A pilot study, Journal of Bionic Engineering, 17 (6): 1175-1185, 2020.
- Baniasad M, Shojaee Fard M, Farahmand F, Aminian K, Can the ground reaction vector be an alternative to conventional gait model to estimate knee adduction moment?, Gait & Posture 81: 24-25, 2020.
- Esmaeili S, Karami H, Baniasad M, Farahmand F, There is a time shift between muscle synergies and kinematic synergies during normal gait, Gait & Posture, 81: 87-88, 2020.
- Nouri MJ, Aminian G, Farahmand F, Rahgozar M, Design and fabrication of a new expandable transtibial liner with manual volume control: A prototype, Journal of Biomedical Physics & Engineering, 10 (4): 543-548, 2020.
- Alamdar A, Samandi P, Hanifeh S, Kheradmand P, Mirbagheri A, Farahmand F, Sarkar S, Investigation of a hybrid kinematic calibration method for the “Sina” surgical robot, IEEE Robotics and Automation Letters, 5 (4): 5276-5282, 2020.
- Sarkarat F, Ahmady A, Farahmand F, Fateh A, Kahali R, Nourani A, Rakhshan V, Comparison of strengths of five internal fixation methods used after bilateral sagittal split ramus osteotomy: An in vitro study, Dental Research Journal, 17 (4): 258-265, 2020.
- Molla RY, Sadeghi H, Farahmand F, Azarbayjani MA, Effect of excessive arm swing on speed and cadence of walking, Men's Health Journal, 4 (1): e5-e5, 2020.
- Sadeghnejad S, Elyasi N, Farahmand F, Vossughi GR, Sadr-Hosseini SM, Hyperelastic modeling of sino-nasal tissue for haptic neurosurgery simulation, Scientia Iranica, 27 (3): 1266-1276, 2020.
- Amirkhani G, Farahmand F, Yazdian SM, Mirbagheri A, An extended algorithm for autonomous grasping of soft tissues during robotic surgery, The International Journal of Medical Robotics and Computer Assisted Surgery, 16(5): e2122, 2020.
- Hoursan H, Farahmand F, Ahmadian MT, A novel procedure for micromechanical characterization of white matter constituents at various strain rates, Scientia Iranica Transactions B: Mechanical Engineering, 27 (2): 784-794, 2020.
- Gharini M, Mohammadi Moghaddam M, Farahmand F, Personalized design of ankle-foot prosthesis based on computer modeling of amputee locomotion, Assistive Technology, 32 (2): 100-108, 2020.
- Hindy A, Farahmand F, Pourdanesh F, Torshabi M, Al-Janabi AH, Rasoulianboroujeni M, Tayebi L, Tabatabaei SF, Synthesis and characterization of 3D-printed functionally graded porous titanium alloy, Journal of Materials Science, 55: 9082- 9094, 2020.
- Yousefsani SA, Shamloo A, Farahmand F, Nonlinear mechanics of soft composites: hyperelastic characterization of white matter tissue components, Biomechanics and Modeling in Mechanobiology, 19, 113-1153, 2020.
- Hoursan H, Farahmand F, Ahmadian MT, A three-dimensional statistical volume element for histology informed micromechanical modeling of brain white matter, Annals of Biomedical Engineering, 48 (4): 1337-1353, 2020.

- Baniasad M, Farahmand F, Arazpour M, Zohoor H, Kinematic and electromyography analysis of paraplegic gait with the assistance of mechanical orthosis and walker, The Journal of Spinal Cord Medicine, 43(6): 854-861, 2020.
- Mehryar P, Shourijeh MS, Rezaeian T, Khandan AR, Messenger N, O'Connor R, Farahmand F, Dehghani-Sanij A, Differences in muscle synergies between healthy subjects and transfemoral amputees during normal transient-state walking speed, Gait & Posture, 76: 98-103, 2020.
- Alamdar A, Farahmand F, Behzadipour S, Mirbagheri A, A geometrical approach for configuration and singularity analysis of a new non-symmetric 2DOF 5R spherical parallel manipulator, Mechanism and Machine Theory, 147: 103747, 2020.
- Darbandi H, Baniasad M, Baghdadi S, Khandan A, Vafaei A, Farahmand F, Automatic classification of gait patterns in children with cerebral palsy using fuzzy clustering method, Clinical Biomechanics, 73: 189-194, 2020.

Patents

- Abedi A, Farahmand F, Nabian MH, Oryadi-Zanjani L, Suture Anchor, WO 2025/003721 A1- 2025.
- Mirbagheri A, Yazdian S, Farahmand F, Sarkar S, Moradi MM, Alamdar A, Vosough Z, Filabi SM, Kheradmand P, Karimian F, Toolabi K, Hanachi MR, Robotic System for Tele-Surgery, US 12213754 B2, 2025.
- Mirbagheri A, Amirkhani G, Yazdian S, Farahmand F, Sarkar S, Controlling a Laparoscopic Instrument, US 12082901 B2, 2024.
- Lotfi M, Farahmand F, Movahhedy MR, Radially Gradient Porous Cylindrical Lattice for Medical Implants, WO 2023/079375 A1, 2023.
- Saghatchi S, Bidgoli JH, Sadeghi MJ, Ahmadian A, Farahmand F, Sarkar S, Accuracy of Electromagnetic Navigating Systems, US 11684458 B2, 2023.
- Mirbagheri A, Farahmand F, Alamdar A, Behzadipour S, Ghannadi B, Jamshidifar H, Seyedhashemi S, Robotic System for Tele-Surgery, US 11844584 B2, 2023.
- Yazdian S, Mirbagheri A, Farahmand F, Handle for Robotic Surgery, US 11452573 B2, 2022.
- Gomari B, Farahmand F, Farkhondeh H, System and Method for Passive Pin Positioning and Locking for Reconfigureable Forming Dies, US 11370014 B2, 2022.
- Alikhani S, Bidgoli JH, Sadeghi MJ, Ahmadian A, Farahmand F, Sarkar S, Location Tracking on a Surface, US 10952798 B2, 2021.
- Bidgoli JH, Ahmadian A, Sadeghi MJ, Ahmadian A, Farahmand F, Sarkar S, Device for Brain Biopsy, US 10631947 B2, 2020.
- Akbar M, Mortazavi Ashkezari SMJ, Bidgoli JH, Ahmadian A, Sadeghi MJ, Ahmadian A, Farahmand F, Sarkar S, Robotic Guide for Brain Biopsy, US 10555784 B2, 2020.
- Mirbagheri A, Farahmand F, Alamdar A, Behzadipour S, Ghannadi B, Jamshidifar H, Seyedhashemi S, Robotic System for Tele-Surgery, US 102198871 B2, 2019.
- Farahmand F, Houshmand A, Mirbagheri A, Mansouri S, Minimally Invasive Heart Stabilizer, US 10292691 B2, 2019.
- Farahmand F, Mirbagheri A, Behzadipour S, Alamdar A, Hanifeh S, Khadem SM, Moradi MM, Adapting Manual Laparascopic Surgical Instruments for Robotic Telesurgery Applications, US 10292779 B2, 2019.
- Nazarinasab D, Sadeghi MJ, Ahmadian A, Farahmand F, Sarkar S, Surgical Instrument, US D833011 S, 2018.