## Ahmed Imran

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#### **Experience:**

- Associate Professor, Department of Biomedical Engineering, Ajman University, Ajman, UAE. September 2018 – present.
- Assistant Professor, Department of Biomedical Engineering, Ajman University, Ajman, UAE. August 1999 – August 2018.
- Assistant Professor (visitor), Department of Biomedical Engineering, Ajman University, Ajman, UAE. February 1999 – August 1999.
- Research Fellow (visitor): 05 July 17 August 1999 & 20 June 31 July 2000, Oxford Orthopaedic Engineering Centre, Oxford University, Oxford.
- Engineer (Trainee), Delhi Electric Supply Undertaking Rajghat Power Plant (coalbased electric power generation plant) – 1990-91.

#### **Qualifications:**

**D. Phil (1998) -** University of Oxford, Oxford, UK. (Mechanics of the ligament deficient knee).

B. Sc. Eng. (Mechanical Engineering) (1990), Jamia Millia Islamia, New Delhi, India.

**Research Areas:** Biomechanics; Biomedical Engineering; Engineering Education.

**Research Publications:** More than 70 publications including journal articles, book-chapters and conference papers and abstracts.

#### **Professional Memberships:**

- American Society of Mechanical Engineering (ASME), USA.
- European Society of Biomechanics. (ESB)
- ▶ International Association of Engineers (IAENG), Hong Kong.

#### **Contributions:**

- Contributed to most aspects of development, implementation and accreditation of B. Sc. (Biomedical Engineering) program at Ajman University during 1999 – present.
- Contributed to several committees at university, college and department level.
- Evaluated Ph. D. theses.
- Acted as assessor for students' scientific competitions.
- > Regularly review scientific papers for international journals and conferences.
- > Contributed to organizational activities for international conferences.
- > Attended several workshops on international accreditation like ABET.
- > Attended several faculty development workshops.

#### **Research Grants, Honors and Awards:**

- Biomet Ltd, Swindon, UK (Research Grant), 1997.
- Biomet Ltd Swindon, UK (1997): (Research Travel Grant).
- Radhakrishnan Memorial Bequest, Oxford, UK, 1994
- Felix Scholarship (1992): Awarded scholarship to study for a research degree at the University of Oxford.
- Selected, through a national level competition in India, as an Engineer Trainee in Bharat Heavy Electricals Limited (BHEL), New Delhi, India (one of the largest public sector organizations in India) (1992).

# Ahmed Imran - List of Publications / Research

(https://scholar.google.ae/citations?user=D6UWbSMAAAAJ&hl=en)

A) Journals:

#### A1) Biomechanics

- 1. Imran A. Optimized Thickness of Meniscal Component in Partial Knee Replacement Analysed with Computer Simulation. Journal of Physics: Conference Series 2071 (1), 012017, 2021.
- 2. Imran A. Sagittal Plane Knee Laxity After Ligament Retaining Unconstrained Arthroplasty: A Mathematical Analysis. J Mechanics in Medicine and Biology, Vol. 12(2); (2012).
- **3.** Imran A. Changes in the Lengths of Anterior Cruciate Ligament Fibres During Tibial Translation at the Knee. J Biomechanics, 45 (S), pp. 373. 2012.
- **4. O'Connor J and Imran A.** *Bearing Movement After Oxford Unicmpartmental Knee Arthroplasty: A Mathematical Model*; Orthopedics; 30 (5S); pp. 42-45, 2007.
- 5. Imran A, Huss RA, Holstein H and O'Connor J. The Variation of Orientation and Moment Arms of the Knee Extensor and Flexor Muscle Tendons with Increasing Muscle Force. Proc Inst Mech Eng (Part H), J Engineering in Medicine: 214(H), 2000, 277-286.
- 6. Imran A, O'Connor J and Murray DW. Shape of the Femoral Component in Unconstrained Unicompartmental Knee Replacement: Does it have to be Polycentric? TraumaLinc (PABST Science Publishers): 2(2), 2000.
- 7. Imran A and O'Connor J. Control of Knee Stability after ACL Injury or Repair: Interaction Between Hamstrings Contraction and Tibial Translation. Clinical Biomechanics: 13(3), 1998, 153-62.
- Imran A and O'Connor J. Theoretical Estimates of Cruciate Ligament Forces: Effects of Tibial Surface Geometry and Ligament Orientations. Proc Inst Mech Eng (Part H), J Engineering in Medicine: 211(H), 1997, 425-439.

# A2) Engineering Education

## Imran A, Nasor M, Hayati F.

- **9.** *Factors Influencing Attrition in a Biomedical Engineering Program.* Procedia Social and Behavioral Sciences; vol. 102, pp. 402 405, 2013.
- **10.** Relating Grades of Math and Science Courses with Students' Performance in a Multi-Disciplinary Engineering Program – A Gender Inclusive Case Study. Procedia - Social and Behavioral Sciences, vol. 46, pp. 3989-3992, 2012.
- Analysis of Students' School Results and Performance in Engineering Programs A Case Study. International Journal on New Trends in Education and Their Implications. (IJONTE-2011), pp. 38–43, vol. 2(4), 2011.

## **B) Book Chapter / Contributions:**

## **B1)** Biomechanics

- 1. Imran A. Cruciate Ligament Behaviour Analysed with Modelling and Simulation of the Human Knee. Advances in Mechanical Engineering, 427-432, 2021.
- Imran A. Investigation of Anterior Cruciate Ligament of the Knee with Relevance to Surgical Reconstruction—A Planar Mathematical Analysis. In: Ao SI., Gelman L., Kim H.K. (eds) Transactions on Engineering Technologies. Springer, Singapore. (2021). https://doi.org/10.1007/978-981-15-8273-8\_4.

- **3.** Imran A. Influence of Tibial Translation on Estimates of Patellar Tendon Force During Knee Flexion. Transactions on Engineering Technologies (WCE-2014), Editors: G C Yang, S L Ao and L Gelman; Publisher: Springer; 2015.
- 4. Imran A. Modelling and Simulation in Orthopedic Biomechanics-Applications and Limitations Computational and Experimental Biomedical Sciences: Methods and Applications; Editors: Tavares, J. M and Jorge, R. M.; Publisher: Springer, Switzerland; 2015.
- 5. Imran A. Influence of Flexing Load Position on the Loading of Cruciate Ligaments at the Knee-A Graphics-Based Analysis. Computational and Experimental Biomedical Sciences: Methods and Applications; Editors: Tavares, J. M and Jorge, R. M.; Publisher: Springer, Switzerland; 2015.
- 6. Imran A, O'Connor J and Lu TW. Computer Simulation of a Mobile Bearing Knee Prosthesis in: Computer Methods in Biomechanics and Biomedical Engineering; Editors: Middleton, J. and Jones, M.L. and Pande, G.N. Gordon and Breach Publishers, Reading, UK: 1998.
- 7. O'Connor J, Goodfellow JW, Imran A, Lu TW, Wilson DR and Feikes J. Kinematics and Mechanics of the Knee with Application to Unicompartmental Replacement and the Pathomechanics of Anteromedial Osteoarthritis. In Unicompartmental Knee Arthroplasty; Editors: Cartier Ph, Epinette JA, Deschamps G and Hernigou Ph. Expansion Scientifique Francaise, Paris: 1997.
- 8. Contribution in Book (Model Animations included on DVD):

*Unicompartmental Arthroplasty with the Oxford Knee*. J Goodfellow, J O'Connor, C Dodd and D Murray, Oxford University Press, USA; 2006. (ISBN: 978-1906884789)

## **B2)** Engineering Education

## 9. A. Imran M. Nasor and F. Hayati

*Gender-Based Statistical Analysis of Students in Engineering Programs Over Ten Years,* in: Engineering Education in the 21st Century Quality, Globalization and Local Relevance, edited by A. Shanableh, K Hamad, M. Omar and M. Bettayeb, published by: College of Graduate Studies and Research, University of Sharjah, UAE, pp. 343-347, 2012.

## C) Conferences:

## C1) Biomechanics:

## A. Imran

1. Cruciate Ligament Behaviour Analyzed with Modelling and Simulation of the Human Knee. International Conference on Advances in Materials Sciences and Engineering, 28–30 December 2020, India.

(Cruciate Ligament Behaviour Analyzed with Modelling and Simulation of the Human Knee. In: Manik, G., Kalia, S., Sahoo, S.K., Sharma, T.K.K., Verma, O.P. (Eds.) in Lecture Notes in Mechanical Engineering, Advances in Mechanical Engineering - Select Proceedings of CAMSE 2020, pp. 427–432; 2021)

 Analysis of Anterior Cruciate Ligament of the Human Knee Using a Mathematical Model. In: Praveen Kumar A., Dirgantara T., Krishna P.V. (eds) Advances in Lightweight Materials and Structures. Springer Proceedings in Materials, vol 8. Springer, Singapore, pp 801–806, 2020.

- 3. Imran A. (2020) Computer Graphics-Based Analysis of Anterior Cruciate Ligament in a Partially Replaced Knee. In: Arai K., Kapoor S., Bhatia R. (eds) Intelligent Computing. SAI 2020. Advances in Intelligent Systems and Computing, vol 1230. Springer, Cham. https://doi.org/10.1007/978-3-030-52243-8 44.
- 4. Computer Graphics Based Analysis of Loading Patterns in the Anterior Cruciate Ligament of the Human Knee. Advances in Intelligent Systems and Computing 998, Ed. Arai, R. Bhatia and S Kapoor. Springer, 1175-80; Springer, 2019.
- 5. Computer graphics based approach as an aid to analyze mechanics of the replaced knee. Advances in Intelligent Systems and Computing, 857, K. Arai et al (Eds.) Springer, pp. 1340-1345, 2019. (https://doi.org/10.1007/978-3-030-01177-2 98).
- 6. *Relating Knee Laxity with Strain in the Anterior Cruciate Ligament.* Lecture Notes in Engineering and Computer Science: Proceedings of The World Congress on Engineering 2017, 5-7 July, 2017, London, U.K., pp1037-1042.
- 7. Analyzing Anterior Knee Laxity with Isolated Fiber Bundles of Anterior Cruciate Ligament. Proc. of the World Congress on Engineering 2016 (WCE-2016), London, UK; 29 June 1 July 2016.
- 8. Understanding Mechanics of the Customized Bionic Knee Joints. IEEE Life Sciences Grand Challenges Conference BioRobotics and Bionics: New Frontiers of Biomedical Engineering; Abu Dhabi, UAE; 25 26 Jan 2016.
- **9.** Analyzing the Patterns of Anterior Knee Laxity During Flexion. The 21st Congress of the European Society of Biomechanics; Prague Czech Republic July 5 8, 2015.
- **10.** Analyzing the Anterior Knee Laxity During Passive Flexion. Proc. of the World Congress on Engineering 2015 (WCE-2015), vol. II pp. 1034-1037, London, UK; 1-3 July 2015.
- 11. Analyzing the Patellar Tendon Force During Quadriceps Muscle Exercise. Proc. of the World Congress on Engineering 2014 (WCE-2014), vol. III pp. 1313-1316, London, UK; 2-4 July 2014.
- 12. The Role of Patellar Tendon in Loading the Cruciate Ligaments at the Knee During *Quadriceps Contraction*. Annual conference of the European Society of Biomechanics; p 056; Patras, Greece, 25 28 August, 2013.
- **13.** Analyzing the Role of Patellar Tendon Force During Flexion of the Knee. The World Congress on Engineering 2013 (WCE-2013), vol III, pp. 1929–1932, London, UK; 3-5 July 2013.
- 14. Mechanics of the knee is influenced by the placement of prosthetics components in unconstrained uni-compartmental arthroplasty. Orthopedics Today, Hawaii, USA; 14 16. Jan. 2013. (Accepted).
- **15.** Analyzing the Positions that could Potentially Load the Anterior Cruciate Ligament of the Knee During Quadriceps Contraction. Proc. 11th International Symposium, Computer Methods in Biomechanics and Biomedical Engineering, Salt Lake City, Utah, USA; 3 7 April, 2013,
- 16. Anterior Cruciate Ligament Fibres Effects of Tibial Translation During Flexion at the *Knee*. The World Congress on Engineering 2012 (WCE-2012), vol III, pp. 1985–1988, London, UK; 4-6 July 2012.
- 17. Changes in the Lengths of Anterior Cruciate Ligament Fibres During Tibial Translation at the Knee. 18th Congress of the European Society of Biomechanics, p-1129, Lisbon, Portugal, 1-4 July 2012.

- **18.** Modeling and Simulation of the Human Diarthrodial Joints Relevance and *Limitations*. ASME 2012 Verfication and ValidationSymposium, 2-4 May 2012, Las Vegas, US. (accepted).
- **19.** Anterior-Posterior Knee Stability in Ligament Retaining Partial Joint Arthroplasty. 6<sup>th</sup> Frontiers in Biomedical Devices Conference (BIOMED-2011), California, USA, 26-27 Sept, 2011. (accepted)
- **20.** Passive Anterior-Posterior Knee Stability After Unconstrained Unicompartmental Arthroplasty. The World Congress on Engineering 2011 (WCE-2011), vol III, pp. 2135–2137, London, UK; 6-8 July 2011.
- 21. The Role of Cruciate Ligaments after Partial Knee Replacement A Planar Mathematical Analysis. ASME Conference on Applied Mechanics and Materials, Chicago, USA; 30May-01 June 2011 (Accepted).
- 22. Knee Laxity After Unicompartmental Joint Replacement: A Planar Mathematical Analysis. First Middle East Conference on Biomedical Engineering (MECBME'11), Sharjah, UAE; IEEE Xplore, pp: 424 427, (DOI: 10.1109/MECBME.2011.5752155); 22-25 Feb. 2011.
- **23.** *Mathematical Model of the Knee for Uni-Compartmental Arthroplasty with Computer Graphics Interface.* Al-Azhar Engineering Eleventh International Conference. Cairo, Egypt; 21-23 Dec. 2010 (Accepted).
- 24. Effects of Surgical Placement of Components in Unicompartmental Knee Arthroplasty Evaluated with a Planar Mathematical Model. 5<sup>th</sup> Frontiers in Biomedical Devices Conference (ASME), California, USA, 20-21 Sept, 2010.
- 25. Unicompartmental Knee Arthroplasty (UKA): Effects of Component Placement on Joint Mechanics Studied with a Mathematical Model. 6<sup>th</sup> World Congress on Biomechanics, In conjunction with 14<sup>th</sup> International Conference on Biomedical Engineering (ICBME), Singapore, 1-6 Aug. 2010. IFMBE Proc. 31; 616-619; 2010.
- 26. O' Connor J and Imran A. Bearing Movement After Oxford Unicmpartmental Knee Arthroplasty: A Mathematical Model. in Meniscal Bearing Knee – Innovating Unicompatmental Knee Arthroplasty; Blenheim Palace, Oxfordshire, UK; Nov. 2006.
- 27. Imran A, O'Connor J and Price A. Comparing Passive and Active Movements After Knee Replacement: A Mathematical Model. International Society for Technology in Arthroplasty (ISTA2000): 13th Annual Symposium, 21-24 September 2000, Germany.

## Imran A, O'Connor J.

- **28.** Geometry of the Femoral Component in Knee Replacement. 45th Annual Meeting, Orthopaedic Research Society, California, 1-4 February 1999.
- **29.** Computer Modelling of Knee Replacement Should the Femoral Condyles be Polycentric? International Society for Technology in Arthroplasty (ISTA98): 11th Annual Symposium, 1-3 October 1998, Marseille, France.
- **30.** Lines of Action and Moment Arms of the Major Force Bearing Structures in the Intact and Replaced Knee: A Theoretical Analysis. 3rd World Congress of Biomechanics, Sapporo (Japan), 2-8 August 1998.
- **31.** *Geometry of the Femoral Components in Knee Replacement: A Theoretical Analysis.* 3rd World Congress of Biomechanics, Sapporo (Japan), 2-8 August 1998.
- **32.** Muscle and Ligament Orientations and Moment Arms in the Intact and Replaced Knee: A Mathematical Simulation. 11th Conference of the European Society of Biomechanics, Toulouse (France), 8-11 July 1998.
- **33.** Shape of the Femoral Component in Knee Replacement: Polycentric or Circular? 11th Conf. of the European Society of Biomechanics, Toulouse (France), 8-11 July 1998.

- **34.** Polycentric Vs Circular Femoral Component in Knee Replacement: A Theoretical Comparison. Combined 8th Conference of European Orthopaedic Research Society and the Netherlands Orthopaedic Assoc., Amsterdam, The Netherlands, 7-10 May, 1998.
- **35.** Shape of the Femoral Component in Unconstrained Unicompartmental Knee Replacement: Does it have to be Polycentric? International Symposium on Unicompartmental Knee Arthroplasty, Nuremberg, 3rd-4th April 1998.
- **36.** Theoretical Evaluation of Polycentric and Circular Femoral Component in Knee *Replacement*. British Orthopaedic Research Society, Spring Meeting with Bone & Tooth Society and the Biometrials Interest Group, Oxford, (UK), 30-31 March 1998.
- **37.** Imran A and O'Connor, J and Lu TW. *Computer Simulation of a Mobile Bearing Knee Prosthesis.* 3rd International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Barcelona, Spain: 7-10 May, 1997.

## Imran A and O'Connor J

- **38.** *Modelling Unicompartmental Meniscal Bearing Knee Replacement.* 21st Annual Meeting of the American Society of Biomechanics, South Carolina, USA: September 24-27, 1997.
- 39. The Role of Hamstrings in Protecting the ACL: A Computer Simulation of Isometric Quadriceps Exercise. Combined 7th Conference of European Orthopaedic Research Society, Barcelona, Spain: April 22-23, 1997.
  (Abstract also in: J Bone & Joint Surgery [Br]: 1998)
- **40.** Computer Simulation of a Mobile Bearing Knee Prosthesis: Effects of Surgical Malplacement. Combined 7th Conference of European Orthopaedic Research Society, Barcelona, Spain: April 22-23, 1997.

(Abstract also in: J Bone & Jt. Surg. [Br]: 1998)

- **41.** Computer Simulation of Surgical Placement of Tibial and Femoral Components in an Unconstrained Knee Prosthesis. 2nd Combined Meeting of the British Orthopaedic Association and its Affiliated Societies; Brighton, UK: September 11-13, 1996. (Abstract also in: J Bone & Joint Surgery [Br]: 79-B(S-I); 1997, pp 115.)
- **42.** Computer Simulation of Surgical Malplacement of an Unconstrained Unicompartmental. Knee Prosthesis with Cruciates Intact. British Orthopaedic Research Society, Autumn Meeting, Brighton, UK: Sept. 9-10, 1996. (Abstract also in : J Bone & Joint Surgery [Br]: 79-B(S-III); 1997)
- **43.** Hamstrings-Tibial Translation Interaction During Isometric Quadriceps Contraction in an ACL-Deficient Knee. British Orthopaedic Research Society, Autumn Meeting, Dundee, UK: Sept. 1995. (Abstract also in : J Bone & Joint Surgery [Br]: 78-B(S-I); 1996, pp 35.)
- **44.** The Effects of Tibial Surface Curvature on Cruciate Ligament Loading. British Orthopaedic Research Society, Autumn Meeting, Dundee, UK: September 1995. (Abstract also in : J Bone & Joint Surgery [Br]: 78-B(S-I); 1996, pp 34.)
- **45.** Stabilisation of ACL-Deficient and ACL-Reconstructed Knee: A Theoretical Study. International Society of Biomechanics, Finland: 2-7 July 1995; pp 420-1.
- C2) Biomedical Engineering Research:

## M. Osman, M. Nasor and A. Imran

**46.** *Connected Healthcare Solution Using Cell phone*. 5<sup>th</sup> Frontiers in Biomedical Devices Conference (ASME), California, USA, 20-21 Sept, 2010.

- **47.** Development of an Electronic Healthcare System for Remote Patient Monitoring and Control. Al-Azhar Engineering Eleventh International Conference. Cairo, Egypt; 21-23 Dec. 2010 (Accepted).
- **48.** Automated Wireless System for Individuals Requiring Continuous Remote Care. 14<sup>th</sup> International Conference on Biomedical Engineering (ICBME), Singapore, 1-6 Aug. 2010. IFMBE Proc. 31; 1421-1423; 2010. www.springerlink.com
- 49. Mobile Phone Based Remote Monitoring and Control System for Individualized Healthcare. First AMA-IEEE Medical Technology Conference, Washington, USA; 21-23 March 2010. http://ama-ieee.embs.org/overview/program/papers/ <u>http://ama-ieee.embs.org/wp-content/themes/ieee/papers/March%2022%20-</u> %20AM/Nasor%20Abstract%2016.pdf

## C3) Engineering Education

## A. Imran M. Nasor and F. Hayati

- **50.** Developing Strategies for Encouraging Engagement and Maintaining Interest of Engineering Students in the 21st Century. 8th International Forum on Engineering Education (IFEE2017), 18-20 APRIL 2017, University of Sharjah, UAE.
- **51.** Understanding the Needs of Students A Study of Student Performance and Continuation in Engineering. Programs 7th International Forum on Engineering Education (IFEE2015), Sharjah, UAE, 17-19 March 2015.
- **52.** Attracting and Retaining Women in Undergraduate Engineering Programs A Case Study. 121st Annual Conference, American Society for Engineering Education (ASEE), Indianapolis, USA, 15-18 June 2014.
- **53.** The Role of Physics and Mathematics Courses in Influencing Students' Performance in Engineering Programs. Engineering Leaders for Grand Challenges Conference, Doha, Qatar, 9-11 November 2014. QScience Proceedings, 2015:61 http://dx.doi.org/10.5339/qproc.2015.elc2014.61
- **54.** Do Women Pursue Programs in Engineering? A Case Study from the United Arab Emirates. World Engineering Education Forum (WEEF2014), Dubai, UAE, IEEE Xplore, pp. 289-292; (DOI: 10.1109/ICL.2014.7017786), 3-6 December 2014.
- **55.** Attracting, engaging and retaining students in engineering programs A case study. IEEE Global Engineering Education Conference (EDUCON); Istanbul, Turkey; IEEE Xplore, pp.: 335 337, (DOI: 10.1109/EDUCON.2014.6826113); 3-5 April 2014.
- **56.** Enhancing Student Retention in Undergraduate Engineering Programs A Case Study. 120<sup>th</sup> ASEE Annual Conference and Exposition, Atlanta, USA; 23-26 July 2013.
- 57. Student Attrition and Retention in a Biomedical Engineering Program A Case Study, 2nd Middle East Conference on Biomedical Engineering (MECBME) Doha, Qatar; 17 – 20 Feb. 2014.
- **58.** *Factors Influencing Attrition in a Biomedical Engineering Program.* 6<sup>th</sup> Int. Forum on Engineering. Education (IFEE-2012) K. L., Malaysia; 20-22 Nov. 2012.
- **59.** Influence of Linguistic Background in School on Students' Performance in Engineering *Programs.* 3<sup>rd</sup> International Conference on New Trends in Education and Their Implications. (ICONTE-2012), pp. 1491-1495, Antalya, Turkey; 26-28 April 2012.
- **60.** Achieving Enhanced Performance in Undergraduate Biomedical Engineering Program. Excellence in Education 2011: Giftedness-Creativity-Development. pp-93, Istanbul, Turkey; 6-9 July, 2011. (conference organized by the International Centre for Innovation in Education (ICIE), Ulm, Germany.)

- **61.** Influence of Mathematics and Science Courses on Students' Performance in Engineering Programs. 2<sup>nd</sup> International Conference on New Trends in Education and Their Implications. (ICONTE-2011), Antalya, Turkey; 27-29 April 2011.
- **62.** Gender-Based Statistical Analysis of Students in Engineering Programs Over Ten Years. 5<sup>th</sup> Int. Forum on Engineering Education – Engineering Education in the 21st Century - Quality, Globalization and Local Relevance, Sharjah, UAE; 23-25 Nov. 2010.

## D) Institutional Research (*unpublished*):

Analysis of Students Attrition Rate in the Early Stages: Causes and Recommendations for Solution, Ajman University of Science & Technology, Ajman, UAE, 2006.