

CURRICULUM VITAE

University of Pittsburgh
School of Health & Rehabilitation Sciences

BIOGRAPHICAL

Name: Nizam U. Ahamed, PhD, CEng

Business Address: Neuromuscular Research Lab,

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Pittsburgh, PA 15203

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EDUCATION and TRAINING

POSTDOC RESEARCHER

2017 - 2019	University of Calgary, AB, Canada	Postdoc	Faculty of Kinesiology
<i>Area of study:</i> Biomechanics, gait, wearable technology, IMU, machine learning.			

GRADUATE

2011 - 2014	University of Malaysia Perlis, Perlis, Malaysia	PhD	Biomedical Engineering
<i>Area of study:</i> Muscle function, electromyography, Signal processing.			
2002 - 2004	University of Madras, Chennai, India	M.Sc.	Computer Science
<i>Area of study:</i> software engineering, artificial intelligence.			

UNDERGRADUATE

1999-2002	University of Madras, Chennai, India	B.Sc.	Computer Science
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APPOINTMENTS and POSITIONS

2019-Present	University of Pittsburgh, Neuromuscular Research Lab, Department of Sports science and Nutrition, School of Health and Rehabilitation Sciences, Pittsburgh, USA	Postdoctoral Associate
2017 - 2019	University of Calgary, Faculty of Kinesiology, Calgary, Alberta, Canada	Postdoctoral Researcher
2014 - 2017	University Malaysia Pahang, Faculty of Manufacturing Engineering, Department of Mechatronic Engineering, Pahang, Malaysia.	Senior Lecturer

2013 - 2014	University Malaysia Perlis, School of Mechatronic Engineering, Department of Biomedical Engineering, Malaysia.	Research Assistant
2011 - 2013	University Malaysia Perlis, School of Mechatronic Engineering, Department of Biomedical Engineering Malaysia.	Graduate Assistant
2010 - 2011	University Malaysia Perlis, School of Mechatronic Engineering, Department of Biomedical Engineering, Malaysia.	Research Assistant
2004 - 2010	Atish Dipankar University of Science and Technology, Faculty of Science and Technology, Dhaka, Bangladesh.	Lecturer

MEMBERSHIP in PROFESSIONAL and SCIENTIFIC SOCIETIES

Chartered Engineer (CEng), Institution of Mechanical Engineers (IMechE), UK	2015-present
Senior Member IEEE (Institute of Electrical and Electronics Engineers), NY, USA	2014-present
Member of Biomedical Engineering Society (BMES), Landover, Maryland, USA	2014-present

RESEARCH SPECIALIZATION KEYWORDS

Artificial intelligence, Machine Learning, Signal Processing, Fractal, Biomechanics, Muscle Function (EMG, MMG), Kinesiology, Pattern Recognition, Rehabilitation, Wearable technology (IMU, GPS).

EDITORIAL ACTIVITIES

2. **Associate Editor:**
 - i. IEEE Access
 - ii. Physical and Engineering Sciences in Medicine
1. **Editorial Board Member:**
 - i. PlosOne
 - ii. Frontiers in Physiology
 - iii. Frontiers in Robotics and Artificial Intelligence

RESEARCH OUTCOMES

1. **Google Scholar:** https://scholar.google.com/citations?hl=en&user=DdJiq6AAAAAJ&view_op=list_works
2. **ResearchGate:** https://www.researchgate.net/profile/Nizam_Ahamed

JOURNAL ARTICLES

- J44. **Ahamed, NU.**, Krajewski, KT., Johnson, CC., Dever, DE., Mi, Q., Flanagan SD., Nidle BC., Connaboy, C. (2020) Understanding Fractal Complexity of Gait Dynamics from wearable IMU Sensors during Load Carriage, *Frontiers in bioengineering and biotechnology* (In review).
- J43. Krajewski, KT., Johnson, CC., Dever, DE., Rawcliffe AJ., **Ahamed, NU.**, Mi, Q., Flanagan SD., Anderst, WJ., Connaboy, C (2020) Load Carriage Magnitude and Locomotion Strategy Alter Knee Total Joint Moment during Bipedal Ambulatory Tasks in Recruit-Aged Women; *Journal of Biomechanics*, 105, pp. 109772.

- J42. **Ahamed, N.U.**, Benson, L. C., Clermont, C. A., Pohl, A., & Ferber, R. (2019). New Considerations for Collecting Biomechanical Data Using Wearable Sensors: How does inclination influence the number of runs needed to determine a stable running gait pattern?. *Sensors (MDPI)*, 19.11 (2019): 2516.
- J41. **Ahamed, N.U.**, Benson, L. C., Clermont, C. A., Osis, S. T., Kobsar, D., & Ferber, R. (2019). Subject-Specific and Group-Based Running Pattern Classification using a Single Wearable Sensor. *Journal of Biomechanics*, 84, 227-233.
- J40. Benson, L. C., **Ahamed, N.U.**, Clermont, C. A., Osis, S. T., Kobsar, D., & Ferber, R. (2018). New Considerations for Collecting Biomechanical Data Using Wearable Sensors: Number of Level Runs to Define a Stable Running Pattern with a Single IMU, *Journal of Biomechanics*, 85, 187-192.
- J39. **Ahamed, N.U.**, Benson, L. C., Clermont, C. A., Osis, S. T., Kobsar, D., & Ferber, R. (2018). Using an accelerometer to classify subject-specific running biomechanical gait patterns based on changes in environmental weather conditions. *PlosOne*, 13(9), e0203839.
- J38. Rabbi, M.F., Ghazali, K.H., Mohd, I.I., Alqahtani, M., Altwijri, O., and **Ahamed N.U.**, (2018). Investigation of the EMG activity of erector spinae and trapezius muscles during Islamic prayer (Salat). *Journal of Back and Musculoskeletal Rehabilitation*.31 (6): 1097-1104.
- J37. Rabbi M.F., **Ahamed, N.U.**, Alqahtani M., *et al.*, (2018). Significance of Electromyography in the Assessment of Diabetic Neuropathy, *Journal of Mechanics in Medicine and Biology*, (In Press).
- J36. Rabbi M.F., **Ahamed, N.U.**, Alqahtani M., *et al.*, (2017). Investigation of the EMG-angle relationship in the upper-limb muscles during isometric contraction, *Biomedical Research-India*, 28(6):2393-2397.
- J35. **Ahamed, N.U.**, Alqahtani, M., Altwijri, O. *et al.*, (2016). Age-related EMG Responses of the Biceps Brachii Muscle of Young Adults, *Biomedical Research-India*, 27 (3):787-793.
- J34. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2016). sEMG Activities of the Three Heads of the Triceps Brachii Muscle During Cricket Bowling. *Journal of Mechanics in Medicine and Biology*,16(5): 1650075
- J33. **Ahamed, N.U.**, Rahman, M., Mamun, A. (2016). Microcontroller based liquid level monitoring system with gsm module. *Far East Journal of Electronics and Communications*, 16(3): 591-601
- J32. Taha, Z., Deboucha, A., **Ahamed, NU.**, Norhafizan A., *et al.* (2015). IIR Filter Order and Cut-off Frequency Influences on EMG Signal Smoothing, *Biomedical Research (India)*,6 (4):616-620
- J31. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2014). Analysis of Crosstalk in the Mechanomyographic Signals Generated by Forearm Muscles During Different Wrist Postures, *Muscle & Nerve*, 51: 899–906.
- J30. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2015). Muscle Fatigue in the Three Heads of the Triceps Brachii During a Controlled Forceful Hand Grip Task with Full Elbow Extension Using Surface Electromyography. *Journal of Human Kinetics*. 46:69-73.
- J29. **Ahamed, N.U.**, Sundaraj, K., Alqahtani, M., Altwijri, O. (2015). Investigation of EMG-Time Relationship on an Adolescent Biceps Brachii muscle during Contractions, *Journal of Physical Therapy Science*, 26(1):39-40.
- J28. Al Mamun, A., Rahman, S.A.M., **Ahamed, N.U.**, *et al.*, (2015). Automatic Car Parking and Controlling System Using Programmable Logic Controller (PLC). *International Journal of Applied Engineering Research*. 10(1):69-75.

- J27. **Ahamed, N.U.**, Sundaraj, Alqahtani, M., Altwijri, O. *et al.*, (2014) EMG-Force Relationship during Static Contraction: Effects on Sensor Placement Locations on Biceps Brachii Muscle, *Technology and Health Care*, 22(4):505-513.
- J26. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2014). Crosstalk in Mechanomyographic Signals from the Forearm Muscles during Sub-maximal to Maximal Isometric Grip Force, *PLoS One*, 9.5 (2014): e96628.
- J25. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2014). Surface Electromyographic analysis of the biceps brachii muscle of cricket bowlers during bowling, *Australasian Physical & Engineering Sciences in Medicine*, 37(1), 83-95.
- J24. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2014). Longitudinal, Lateral and Transverse Axes of Forearm Muscles Influence the Crosstalk in the Mechanomyographic Signals during Isometric Wrist Postures, *PLoS ONE*, 9(8): e104280. doi: 10.1371/journal.pone.0104280
- J23. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2014). Evaluation of repetitive isometric contractions on the heads of triceps brachii muscle during grip force exercise, *Technology and Health Care* 22(4):617-625.
- J22. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2014). Recent observations in surface electromyography recording of triceps brachii muscle in patients and athletes, *Applied Bionics and Biomechanics* 11(3):105-118.
- J21. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2014). Evaluation of triceps brachii muscle strength during grip force exercise through surface electromyography, *Biomedical Research (India)*, 25(3): 351-356.
- J20. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2014). Significance of the Electromyographic Analysis of the Upper Limb Muscles of Cricket Bowlers: Recommendations from Studies of Overhead-Throwing Athletes, *Journal of Mechanics in Medicine and Biology*, 14(4):1430005(1-15).
- J19. Mamun, A. L., Ahmed, N., Alqahtani, M., Altwijri, O., Rahman, M., **Ahamed, N.U.**, Rahman, S.A.M.M., Ahmad, R.B., SundaraJ, K. (2014). A Microcontroller-Based Automatic Heart Rate Counting System from Fingertip, *Journal of Theoretical & Applied Information Technology*, 62(3): 597-604.
- J18. Mamun. A. Al., Ahmed. N., **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. (2014). Use of Wireless Sensor and Microcontroller to Develop Water-Level Monitoring System. *Indian Journal of Science and Technology*, 7(9):1325-1330.
- J17. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2013). Effects of Anthropometric Variables and Electrode Placement on the SEMG Activity of the Biceps Brachii Muscle during Submaximal Isometric Contraction in Arm Wrestling, *Biomedical Engineering /BiomedizinischeTechnik*, 58(5):475-488.
- J16. **Ahamed, N.U.**, Sundaraj, K., and Poo, T.S., (2013) Design and development of an automated, portable and handheld tablet personal computer-based data acquisition system for monitoring electromyography signals during rehabilitation, *Proceedings of the Institution of Mechanical Engineers, Part H, Journal of Engineering in Medicine*, 227(3):262-274.
- J15. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2013). Surface Electromyography assessment on biceps brachii muscle between endplate region and distal tendon insertion: Comparison in terms of gender, dominant arm and contractions, *Journal of Physical Therapy Science*, 25(1):3-6.
- J14. Islam, A., Sundaraj, K., Ahmad, B., and **Ahamed, N.U.** (2013) Mechanomyogram for Muscle Function Assessment: A Review, *PLoS One*, 8(3): e58902.

- J13. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2013). Mechanomyography Sensor Development, Related Signal Processing and Applications: A Systematic Review, *IEEE Sensors Journal*, 13(7):2499-2516.
- J12. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2013). Coherence in muscle activity of the biceps brachii at middle, proximal and distal tendon region among the arm wrestling contestants. *Biomedical Research-India*, 24(2):245-251.
- J11. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., Islam, A., and Palaniappan, R., (2013). Rehabilitation Systems for Physically Disabled Patients: A brief review of sensor-based computerised signal-monitoring systems, *Biomedical Research-India*, 24(3):370-376.
- J10. Palaniappan, R., Sundaraj, K., and **Ahamed, N.U.** (2013). Computer Based Respiratory Sound Analysis: A Systematic Review, *IETE Technical review*, 30(4):245-253.
- J9. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2013). Surface Electromyography for Assessing Triceps Brachii Muscle Activities: A Literature Review, *Biocybernetics and Biomedical Engineering*, 33(4):187-195.
- J8. Palaniappan, R., Sundaraj, K., and **Ahamed, N.U.** (2013). Machine Learning in Lung Sound Analysis: A Systematic Review. *Biocybernetics and Biomedical Engineering*, 33(3):129-135.
- J7. Sim, K. F., Sundaraj, K., **Ahamed, N.U.**, Lam, C.K. et al. (2013). Hybrid Markerless Tracking of the Complex Articulated Motion in Golf Swings, *Journal of Bodywork and Movement Therapies*, 18(2):220-227.
- J6. Al-Mamun, A., Sundaraj, K., Ahmed, N., Rahman, M., Rahman, M., **Ahamed, N.U.**, (2013) Design and development of a pc-based automated data logging system for measuring temperature, *ARPN Journal of Engineering and Applied Sciences*, 8(11):960-968.
- J5. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2012). Gait disorder rehabilitation using vision and non-vision based sensors: A systematic review, *Bosnian Journal of Basic Medical Sciences*, 12(3):193-202.
- J4. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2012). Mechanomyography sensors for muscle assessment: a brief review, *Journal of Physical Therapy Science*, 24(12):1359-1365.
- J3. **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. Rahman, M., Ali, A., and Islam, A. (2012). Analysis of the effect on electrode placement on an adolescent's biceps brachii during muscle contractions using a wireless EMG sensor. *Journal of Physical Therapy Science*, 24(7):609-611.
- J2. **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. Rahman, M., Ali, A., and Islam, A. (2012). Electromyographic responses during elbow movement at two angles with voluntary contraction: Influences of muscle activity on upper arm biceps brachii, *Research Journal of Applied Sciences, Engineering and Technology*, 4(22): 4591-4595.
- J1. **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. Rahman, M., Nadarajah, S., Poo, T.S., and Rahman, M. (2011). Recent Survey of Automated Rehabilitation Systems Using EMG Biosensors. *Journal of Physical Therapy Science*, 23(6):945-948.

BOOK CHAPTERS

- B1. Rahman M., Ali, A., Alqahtani, M., Altwijri, O., Ahmed, N. and **Ahamed, N.U.** (2020). Ensemble-Based Machine Learning Algorithms for Classifying Breast Tissue Based on Electrical Impedance Spectroscopy. Book Series: Advances in Intelligent Systems and Computing (**Springer International Publishing**). AHFE International Conference on Human Factors, Software, Service and

Systems Engineering, July 2019, Washington D.C., USA.

- B2. Rahman M., **Ahamed, N.U.**, Alqahtani, M., Altwijri, O., Sundaraj, K and Ahmed, N. (2014). Relationship between EMG Activity and Endurance Time in the Biceps Brachii Muscle during Isokinetic Contraction, Regional conference in science, technology and social sciences, Malaysia, **Springer**, Ch 48, pp.487-494.
- B3. **Ahamed, N.U.**, Rabbi, M.F., Taha, Z. et al., (2016). The Effects of Rest Interval on Electromyographic Signal on Upper Limb Muscle during Contraction. IFMBE proceedings Book series by **Springer**, 3rd International Conference on Movement, Health & Exercise 2016 (MoHE2016), 28 – 30 September, Malacca, Malaysia, Vol. 58, pp. 10-13.
- B4. Nabi, F.G., Sundaraj, K., Lam C.K., Palaniappan, R., Sundaraj, S.,and **Ahamed, N.U.** (2016). Artificial Intelligence Techniques used for Wheeze Sounds Analysis: Review. IFMBE proceedings Book series by **Springer**, 3rd International Conference on Movement, Health & Exercise 2016 (MoHE2016), 28 – 30 September, Malacca, Malaysia. Vol. 58, pp. 37-40.

CONFERENCE PUBLICATIONS

- C25. **Ahamed, NU.**, Krajewski, KT., Johnson, CC., et al., (2020). Foot Acceleration Attenuation Reduces During Military Load Carriage, *2020 67th Annual Meeting of the American College of Sports Medicine*, San Francisco, CA. Submitted for Oral Presentation, pending acceptance
- C24. Krajewski, KT., Johnson, CC., Dever, DE., **Ahamed, NU.**, Mi, Q., Anderst, WJ., Connaboy, C. Locomotion Pattern Alters Apparent Joint Stiffness During Unloaded and Loaded Bipedal Ambulatory Tasks in Women. *2020 67th Annual Meeting of the American College of Sports Medicine*, San Francisco, CA. Submitted for Oral Presentation, pending acceptance
- C23. Krajewski, KT., Johnson, CC., Dever, DE., **Ahamed, NU.**, Mi, Q., Anderst, WJ., Connaboy, C. (2019) Load Magnitude and Locomotion Strategy Alters Knee Mechanics in Recruit-Aged Women. 2019 Mid-Atlantic Regional Meeting of the American College of Sports Medicine, Harrisburg, PA. Presentation Complete.
- C22. **Ahamed N.U.**, Benson, L., Sean, O., Clermont, C., Ferber, R. (2017). Fuzzy Inference System-based Recognition of Slow, Medium and Fast Running Conditions Using a Triaxial Accelerometer, *Complex Adaptive Systems 2017 (Chicago, USA)*, *Procedia Computer Science (Elsevier)*, 114 (2017): 401-407.
- C21. Rabbi, FZ, Ghazali, K.H, **Ahamed, N.U.**, Sikandar, T. (2017). Time and frequency domain features of Electromyography (EMG) signal during Islamic Prayer (Salat), in proc. IEEE International Colloquium on Signal Processing and Its Application (CSPA), Malaysia, pp. 139-143.
- C20. **Ahamed, N.U.**, Taha, Z., et. Al. (2016). Development of Fuzzy Inference System for Automatic Tea Making. **IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS 2016)**, Malaysia, pp. 2016, 196-201.
- C19. **Ahamed, N.U.**, Yusof Z., et, al., (2016). Fuzzy Logic Controller Design for Intelligent Drilling System. **IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS 2016)**, Malaysia, pp. 208-213.
- C18. **Ahamed, N.U.**; Taha, Z., et.al. (2016). Fuzzy Logic Controller Design for Intelligent Air-Conditioning System. **2nd IEEE International Conference on Control Science and Systems Engineering (ICCSSE 2016)**, Singapore, pp.232-236.
- C17. Z Taha, CM Lee, **Ahamed N.U.**, S Joseph, SFS Omar (2016). Performance Analysis in Strength Training: An Innovative Instrumentation. *The 11th International Sports Engineering, Delft, Netherland. Procedia Engineering (Elsevier)*, 147, 455-460.
- C16. **Ahamed, N.U.**, Taha, Z., et.al., (2015) Age Related Differences in the Surface EMG Signals on Adolescent's Muscle during Contraction, **2nd International Manufacturing Engineering Conference (iMEC 2015)**. Nov 12-14, 2015, Kuala Lumpur, Malaysia, IOP Conference Series: Materials Science and

Engineering, 114 (1), 012131.

- C15. **Ahamed, N.U.**, Zulkifli Y.; Alqahtani, M. et al., (2015). Gender Effects in Surface Electromyographic Activity of the Biceps Brachii Muscle during Prolonged Isometric Contraction, Complex Adaptive Systems, 2-4 Nov 2015, San Jose, CA, USA, Procedia Computer Science (Elsevier), 61(2015), 448-453.
- C14. **Ahamed, N.U.**, Zulkifli Y.; Alqahtani, M. et al., (2015). Relation between EMG Signal Activation and Time Lags using Feature Analysis during Dynamic Contraction, 2ndInt.IEEEConference on Advanced Informatics: Concepts, Theory and Applications (ICAICTA), Paper presented in Chonburi, Thailand, 22-24 Aug, pp 1-4.
- C13. Rahman, M. S.A.M, **Ahamed, N.U.**, Sundaraj, K, Ali, A. and Islam, M. (2014) Surface EMG-based Activity Analysis on Forearm Muscle: A Methodological Proposal for Ergonomics Epidemiology, The first Movement, Health & Exercise (MoHE-2014) Conference, Kuantan, Pahang, Malaysia, September 2-3, 2014.
- C12. Rahman, S. A. M., Al Mamun, M. A., **Ahamed, N. U.**, Ahmed, N., Ali, M. S., & Islam, M. M. (2014). Design of automatic controlling system for tap-water using floatless level sensor. **IEEE** International Symposium on Robotics and Manufacturing Automation (ROMA), December 2014, Kuala Lumpur, Malaysia pp. 18-21.
- C11 Al-Mamun, Sundaraj, K., Ahmed, N., **Ahamed, N.U.**, Rahman, M., Ahmad, R. B., & Kabir, H. (2013) Design and Development of a Low-Cost Solar Energy System for the Rural Area, **IEEE** International Conference on Systems, Process & Control, Kuala Lumpur, Malaysia, December 13-15, 2013, pp. 31-35.
- C10 Islam, A., Sundaraj, K., Ahmad R. B., Rahman, M., **Ahamed, N.U.**, and Ali, A. (2013). Wrist Extension and Flexion Muscle Activity Identification using Fundamental Frequency of Mechanomyograms, **IEEE** International Conference on Recent Advances in Computational Systems (RAICS), Trivandrum, India, December 19-21, 2013.
- C9. Ali, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, Islam, A. (2012). Vision-based Motion Tracking Rehabilitation System for Gait Disorder, **IEEE** International Conference on Control System, Computing and Engineering, Penang, Malaysia, pp.371-375.
- C8. **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. Rahman, M., and Ali, A. (1012). A framework for the development of measurement and quality assurance in software-based medical rehabilitation systems. International Symposium on Robotics and Intelligent Sensors 2012 (IRIS 2012), Kuching, Sarawak, Malaysia, September 4-6, Procedia Engineering (Elsevier), 41:53-60.
- C7. **Ahamed, N.U.**, Sundaraj, K., Ahmad, R.B. Rahman, M., and Islam, A. (1012). Analysis of right arm biceps brachii muscle activity with varying the electrode placement on three male age groups during isometric contractions using a wireless EMG sensor. International Symposium on Robotics and Intelligent Sensors 2012 (IRIS 2012), Kuching, Sarawak, Malaysia, September 4-6, Procedia Engineering (Elsevier), 41:61-67.
- C6. **Ahamed, N.U.**, Sundaraj, K., Ahmad R.B., Rahman, M., Ali, A., and Islam, A. (2012). Non-invasive electromyography-based fatigue detection and performance analysis on m.bicepsbrachii muscle, **IEEE** International Conference on Control System, Computing and Engineering, Penang, Malaysia, pp. 302-306.
- C5. **Ahamed, N.U.**, Sundaraj, K., et al. (2012). Variability in surface electromyography of right arm biceps brachii muscles between male adolescent, vicenarian and tricenarian with distinct electrode placement, The Third **IEEE** Conference on, Sustainable Utilization and Development in Engineering and Technology, Kuala Lumpur, Malaysia, pp. 24-28.
- C4. Islam, A., Sundaraj, K., Ahmad, R. B., **Ahamed, N.U.**, and Ali, A. (2012). Mechanomyographic Applications for Automatic Rehabilitation System on Tennis Elbow Muscles. Proceedings of the 2nd Int. Malaysia-Ireland Joint Symposium on Engineering, Science and Business (IMiEJS2012), Kuala Lumpur, Malaysia, 18-20 June, pp. 849-852.

- C3. **Ahamed, N.U.**, Sundaraj, K., et al., (2012). An electromyographic effect from biceps brachii muscles during isometric contraction varying the range of motion (ROM) of the elbow, Proceedings of the The 2nd International Malaysia-Ireland Joint Symposium on Engineering, Science and Business 2012 (IMiEJS2012), Kualampur, Malaysia, 18 - 20 June, 2012, pp. 714-717.
- C2. Hussain, A.T.; Said, Z.; **Ahamed, N.U.**, Sundaraj, K.; Hazry, D. (2011). Real-Time Robot-Human Interaction by Tracking Hand Movement & Orientation Based on Morphology. IEEE Int Conference on Signal and Image Processing Applications, 16-18 Nov, Kuala Lumpur, Malaysia, pp.283-288.
- C1. **Ahamed, N.U.**, Sundaraj, K., Badlisha, R. (2011). Software Measurement and Quality Assurance: an overview for Computer Assisted Automated Medical Rehabilitation Systems. Proceeding of the International Postgraduate Conference for Engineering (IPCE), October 22-23, Universiti Malaysia Perlis (UniMAP) Perlis, Malaysia, pp. 32.

PUBLISHED ABSTRACTS

- A1. Rahman. S.A.M., **Ahamed. N.U.**, Sundaraj. K., et. Al. "Surface EMG-Based Activity Analysis on Forearm Muscle: A Methodological Proposal for Ergonomics Epidemiology, The first Movement, Health and Exercise (MoHE) Conference, 2014, Pahang, Malaysia.
- A2. Rahman. S.A.M., **Ahamed. N.U.**, Sndaraj K., et. Al., "Surface EMG-based Fatigue Analysis during Repetitive Work: A Review", National Postgraduate Conference for Postgraduate Research (NCON-PGR 2015), Malaysia

POSTER PRESENTATION

- P3. **Ahamed, N.U.**, Benson, L. C., Clermont, C. A., Pohl, A., & Ferber, R. (2019). A Machine Learning Approach to Understand Intrinsic and Extrinsic Factors that Influence Running Gait Patterns. Human Performance Optimization Symposium, June 11, 2019, University of Pittsburgh, PA, USA.
- P2. **Ahamed N.U.**, Krajewski, K., Qi, Mi; Nindl, C.B. and Chris, C (2019). "An Artificial-Intelligence Approach to Musculoskeletal Injury Detection using Wearable Sensors", Fourteen Annual Postdoctoral Data & Dine Symposium, May 16, 2019, University Club, University of Pittsburgh.
- P1. **Ahamed, N.U.**, Benson, L. C., Clermont, Ferber, R. (2017). GAITOMATIC: Fuzzy-based Automatic Running Conditions Identification using Wearable Technology Sensor Technology in Monitoring Movement (STiMM), November 16th, 2017, University of Calgary, AB, Canada.

RESEARCH AWARDS

- AW4. **Gold** medal under the competition "UniMAP research exhibition 2012/2013". Product entitled: "ARMS: Automatic Rehabilitation Monitoring System", (Full system with Tablet PC).
- AW3. **Silver** medal under the competition "UniMAP research exhibition 2011/2012". Product entitled: "ARMS: Automatic Rehabilitation Monitoring System".
- AW2. **Bronze** medal under the category of "Bio-Medical Research" in BIOMALAYSIA 2011, Conference and Exhibition, Pacific Rim summit on industrial biotechnology and bio-energy, Kuala Lumpur, Malaysia. Product entitled: "ARMS: Automatic Rehabilitation Monitoring System".
- AW1. **Bronze** medal under the category of "PECIPTA- 2013 international Conference and Exposition on Invention of Institutions of Higher Learning, Kuala Lumpur, Malaysia, Product entitled: "ARMS: Automatic Rehabilitation Monitoring System".

Intellectual Property (IP) Rights

IP1. Name: “ARMS-Automated Rehabilitation Monitoring System”; IP No.: **LY2013000907** (MyIPO); Year: 2013.

Research Grant Participation

Current

9/30/2018 – 9/29/2021 **Role: Co-Investigator:** *Physiological Biomarkers of Resilience and Musculoskeletal Readiness*, (W81XWH-18-1-0452, DOD – Department of the Army, USA: USAMRAA)

Completed

12/25/2014 – 12/24/2016 **Role: Principal Investigator:** *Assessment of Surface Electromyographic Signals During Muscle Contraction from Normal Subjects and Rehabilitated Patients with Upper Limb Pain*, (University Malaysia Pahang (UMP), Malaysia Internal Research Grant (RDU1403157)).

07/05/2014 – 07/04/2015 **Role: Principal Investigator:** *Analysis of Electromyographic Activity on Diabetic Patient's Upper Limb Muscles during Voluntary Contraction*, (University Malaysia Pahang (UMP), Malaysia; Seed Research Grant (RDU141114)).

07/ /2016 - 06/ /2019 **Role: Co-Investigator:** *Investigation on Parametric and Non-Parametric Features of Wheeze Signals for the Classification of Asthma Severity using Respiratory Acoustic Sounds and Machine Learning Algorithms*, Fundamental Research Scheme Grant (FRGS), Ministry of Higher Education, Malaysia.

11/ /2015 - 04/ /2017 **Role: Co-Investigator:** *Development of Software Prototype to Determine Crosstalk Levels in Mechanomyographic (MMG) Signals of Forearm Muscles during Grip Force and Wrist Actions*. Ministry of Science, Ministry of Science, Technology & Innovation (MoSTI), Malaysia, (Co-Researcher), Duration: Nov 2015 - April 2017 (Completed).

04/ /2015 - 09/ /2016 **Role: Co-Investigator:** *Development of Software Prototype to Determine Respiratory Flow and Severity Level of Respiratory Pathologies using Pulmonary Acoustic Signals*. Ministry of Science, Technology & Innovation (MoSTI), Malaysia.

Media Coverage

1. Proper use of wearable technology is considered the 'wild, wild west' (2019, March 6) retrieved 2 March 2020 from <https://medicalxpress.com/news/2019-03-proper-wearable-technology-wild-west.html>
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TECHNICAL SKILLS

Programming Language

Browser Scripting : JavaScript, HTML, DOM, DHTML, VBScript
Server Scripting : SQL, ASP, ADO, PHP, Oracle 8i&9i
NET (dot net) : .NET Microsoft, .NET ASP, .NET Mobile
Multimedia : SMIL, SVG, Adobe Photoshop.

Development Languages : Python, C, C# (Sharp), C++, Java, Visual Basic, WAP & Prolog.
System Design & Application Software : MATLAB, Python (API)
Statistical Software : SPSS, Minitab, MedCalc

ACHIEVEMENTS

1. **Best Poster presentation**, Title: A Machine Learning Approach to Understand Intrinsic and Extrinsic Factors that Influence Running Gait Patterns. Human Performance Optimization Symposium, June 11, 2019, University of Pittsburgh, PA, USA.
 2. University of Calgary Office of the Vice President (Research) Postdoctoral Research Award.
 3. **IEEE Best Scientific Paper Awarded** in the 2nd IEEE international conference on Control Science and Systems Engineering (ICCSE 2016), Nanyang Technological University, Singapore.
 4. Editorial Award from *Biocybernetics and Biomedical Engineering* Journal for **Most Cited Article**. Paper title: “**Machine learning in lung sound analysis: A systematic review**”
 5. **Outstanding Contribution in Reviewing** from the Journal of “*Computer Methods and Programs in Biomedicine*”.
 6. **Conference Committee Member**, 3rd IEEE International Conference on Control Science and Systems Engineering (ICCSSE 2017), China.
 7. **Conference Committee Member**, 2nd IEEE International Conference on Control Science and Systems Engineering (ICCSSE 2016), Singapore.
 8. **Conference Organizing Committee Member** (Sessions Chair), International Postgraduate Conference on Engineering (IPCE 2011), 22nd -23rd October 2011, Malaysia.
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LEADERSHIP ROLES

1. **Head of Research Group**, Mechatronic System Design, Faculty of Manufacturing Engineering, University Malaysia Pahang, Malaysia.
 2. **Head of the Department**, Department of Computer Science, Atish Dipankar University of Science and Technology, Gulshan, Dhaka, Bangladesh
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ACADEMIC EVALUATION ACTIVITIES

1. As Reviewer in International Journals

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| ❖ Scientific Report | ❖ Nano Energy |
| ❖ PLOS ONE | ❖ Physiological Reports |
| ❖ IEEE Transactions on Neural Systems & Rehabilitation Engineering | ❖ IEEE Sensors Journal |
| ❖ Muscle & Nerve | ❖ IEEE Transactions on Biomedical Engineering |
| ❖ Sensors (MDPI) | ❖ Medical & Biological Engineering & Computing |
| ❖ Journal for the Measurement of Physical | ❖ IEEE Transactions on Biomedical Engineering |
| | ❖ Experimental Gerontology |

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|---|---|
| Behaviour | ❖ Frontiers Neurology |
| ❖ Journal of Biomechanics | ❖ Biomedical Engineering Letters |
| ❖ IEEE Access | ❖ Computer Methods and Programs in Biomedicine |
| ❖ Pain Practice | ❖ Chemical Engineering Communication |
| ❖ Journal of Visualized Experiments (JoVe) | ❖ Sports (MDPI) |
| ❖ Engineering Management Journal (EMJ) | ❖ Advances in Mechanical Engineering |
| ❖ Sports Biomechanics | ❖ Australasian Physical & Engineering Sciences in
Medicine |
| ❖ International Journal of Engineering &
Technology | ❖ Part H: Journal of Engineering in Medicine |
| ❖ Journal of Sports Engineering and Technology | ❖ IEEE Journal of Biomedical and Health Informatics |
| ❖ Biomedical Engineering/Biomedizinische
Technik (BMT) | ❖ MYOPAIN: A Journal of Myofascial Pain and
Fibromyalgia |
| ❖ Journal of Physical Therapy Science | ❖ Journal of Sport and Health Science |
| ❖ Informatics in Medicine Unlocked | ❖ Electronics (MDPI) |

2. Reviewer/Technical Program Committee Member in International Conferences

- The IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), 2019, University of Illinois, Chicago, USA
- IEEE Future of Information and Communication Conference (FICC, 2019), San Francisco, USA
- IEEE Future Technologies Conference (FTC, 2018), Vancouver, BC, Canada
- Complex Adaptive Systems, 2017, Chicago, USA.
- The 3rd IEEE Int. Conference on Control Science and Systems Engineering (ICCSSE 2017), China.
- The 2nd IEEE Int. Conference on Control Science and Systems Engineering (ICCSSE 2016), Singapore.
- Int. Conference on Biomedical Engineering (ICoBE 2017), Malaysia
- Int. Conference on Innovative Technology, Engineering and Sciences (iCITES, 2018), Malaysia
- Int. Symposium on Computational Intelligence & Applications (ISCIA2017, Malaysia,
- Int. Symposium of Information and Internet Technology (SYMINTTECH), 2017, Thailand
- IEEE Conference on Systems, Process and Control (ICSPC 2016), Melaka, Malaysia,
- IEEE Symposium on Computer Applications & Industrial Electronics, 2016, Penang, Malaysia,
- 3rd Int. Conference on Mechanical, Materials and Manufacturing (ICMMM 2016), GA, USA.
- 5th Int. Conference on Design and Concurrent Engineering (IDECON 2016), Malaysia.
- Second Int. Manufacturing Engineering Conference 2015 (iMEC 2015), Kuala Lumpur, Malaysia.
- The first Movement, Health and Exercise (MoHE) Conference, 2014, Kuantan, Malaysia.
- Int. Symposium of Information and Internet Technology, 2016 in Melaka, Malaysia.
- The 10th IEEE Asian Control Conference 2015 (ASCC 2015), Kota Kinabalu, Malaysia.
- Int. Conference on Computational Intelligence and Advanced Manufacturing Research (ICCIAMR 2014), Chennai, India.

3. As Reviewer in Research Grants Application

- **External:**
 - Chilean National Science and Technology Commission (CONICYT - Chile)

- **Internal:**

- Review panel member for Research Grant Proposal, Department of Mechatronic Engineering, Faculty of Manufacturing Engineering, University Malaysia Pahang, Malaysia.

4. As Reviewer of Thesis Committee

- Served on several thesis committees for graduate students in a variety of disciplines including Mechatronic Engineering, Computing science, Rehabilitation and Sports Engineering.

5. Postgraduate Thesis Evaluation

<u>Degree</u>	<u>Title</u>	<u>Institute/ Organization</u>	<u>Role</u>
PhD (2016)	Modelling and Analysis of Soccer Heading and Protective Headgear	University Malaysia Pahang, Malaysia	Internal Reviewer
PhD (2017)	Design and Development of Flat Plate Heat Pipe for Electronic Cooling using Nano Fluids	Anna University, Chennai, India.	External Reviewer
PhD (2017)	Experimental Investigation on Synthesis, Characterization and machining of AA6061/TiC Composites using EDM	Anna University, Chennai, India.	External Reviewer
PhD (2019)	Aspect level Opinion Mining and Sentiment Classification in Summarization of Quality Services for Cross Domain	Anna University, Chennai, India.	External Reviewer
PhD (2019)	Critical Machine based heuristic for two stage hybrid flowshop group scheduling problems	Vels Institute of Science, Technology & Advanced Studies, Chennai, India.	External Reviewer
PhD (2019)	Computer Aided detection of Minuscule Malignant Nodules from CT Images of the Lungs	Vels Institute of Science, Technology & Advanced Studies, Chennai, India.	External Reviewer
PhD (2019)	Feature Enhanced Automatic Image Change Detection for Oil Spills Management in Ocean using Satellite Image	Vels Institute of Science, Technology & Advanced Studies, Chennai, India.	External Reviewer
PhD (2019)	Study on Properties, processing and Characterization of Newly Formulated Nano Carbon Fiber Reinforced Polymer Composite	Vels Institute of Science, Technology & Advanced Studies, Chennai, India.	External Reviewer

STUDENT SUPERVISION

1. Post Graduate Research Students (PhD, Full Time)

i. As Co-Supervisor

- Name: Abdel hakim Deboucha.
- Title: “A Comprehensive Analysis of Surface Electromyography for Control of Lower Limb Exoskeleton”,
- Institute: Mechatronic Engineering, University Malaysia Pahang (UMP), Malaysia, 2014 (Finished).

2. Undergraduate Student (Final Year Project):

As Main Supervisor: Supervised more than 20 (twenty) students.

TEACHING OUTCOME

- **Subjects Taught**

1. Fundamental of Computer
2. Computer Programming (C/C++)
3. Digital Signal processing (with Matlab)
4. Software Engineering (with C# & .Net)
5. Artificial Intelligence (Prolog, Matlab and Python)
6. Object Oriented Programming (with Java)
7. Web programming
8. Biomedical and Biomechanics
9. Digital Electronic Principles

- **Course Co-coordinator:**

1. Computer Programming (BHM2003 and BFF2003), 2. Software Engineering (BHM3323), 3. Artificial Intelligence (BFM3003).

- **Teaching award**

1. Received “**Certificate of Excellence**” award for “**Excellent**” performance in the instructional evaluation and exceptional commitment towards teaching and learning for “**Computer Programming**”, “**Artificial Intelligence**” and “**Software Engineering**” Courses from University Malaysia Pahang, Malaysia.