

# **RESUME**

Name : **AMIT ROY CHOWDHURY**

Present Status : Professor  
Department of Aerospace Engg & Applied Mechanics  
Bengal Engineering & Science University, Shibpur  
Howrah-711103, India

Phone No. & Email : +91-98304657106  
[arc\\_98@rediffmail.com](mailto:arc_98@rediffmail.com) / [archowdury@appmech.becs.ac.in](mailto:archowdury@appmech.becs.ac.in)

Qualification : BE, MTech, Ph.D (Mechanical Engineering)

**Area of Specialization** : **Finite Element Method, Solid Mechanics, Biomechanics**

## **Position**

### Position and Employment (**Starting with the most recent employment**)

<b>Sl No.</b>	<b>Institution / Place</b>	<b>Position</b>	<b>From (Date)</b>	<b>To (date)</b>
1.	Bengal Engineering & Science University, Shibpur, Howrah.	Professor in Applied Mechanics	19-11-97	Continuing (From 19/11/12 as Professor)
2.	<b>State University of Newyork (SUNY), Brooklyn, New York USA</b>	<b>Visiting Assistant Professor</b>	<b>2008-09</b>	<b>14/4/2008 to 31/3/2009</b>
3.	Research Engineers Ltd.	Sr. Engineer	01-7-96	18-11-97

### **Information Regarding Ph.D Guidance (COMPLETED)**

1	Jayanta Kumar Biswas	Design and Development of Patient Specific Lumbar Implant	Awarded on 2018
2	Amalendu Sahoo	Automobile frontal impact on knee-thigh-hip complex and its safety	Awarded on 2018
3	Salim Kaizer	Development and application of Sc-Mg alloy	Awarded on 2003
4	Santanu Majumder	Response of pelvis for sideways fall	Awarded on 2004
5	Nityananda Nandi	Design & development of earthen Dam	Awarded on 2004
6	Shamik Sarkar	Effects on Head for Different types of Impact	Awarded on 2004
7	Prasun Kumar Lenka	Design & Development of Lower limb prosthetics	Awarded on 2010
8	Ujjal Bhanu Ghosh	Design & Development of hip implant	Awarded on 2012
9	Partha Sarathi Banerjee	Design & development of a Novel Spinal Implant	Awarded on 2015
10	Palash Maji	Design & development of a patient specific hip Implant	Awarded on 2016
11	Subhomoy Chatterjee	Subject-specific stiffness customization of cementless femoral stem for optimal interfacial bone growth	Awarded on 2017
12	Sandipan Roy	Design and Development of Implant Material and Its Application in Patient Specific Dental Prosthesis	Awarded on 2017

**Seven no of candidate have been registrared.**

### **Information about ME Thesis**

1. **30** students have completed.
2. **2** students are working.

## **Sponsored Project work Completed or ongoing as Principal Investigator**

1. Finite Element Analysis of Human Head Under Impact loading – **Dept. of Sc & Technology (Govt. Of India) Principal Investigator.**
2. Design and Development of Dental Implant, a finite element and experimental studies- **University Grant Commission, India Principal Investigator**
3. Design and Development of easy to use , pedal reciprocating Pump – **DST (Govt of West Bengal) India Principal Investigator**
4. Design & Development of Patient Specific Implant - **DBT (Govt of India) India Principal Investigator**
5. Computer Aided Design analysis and Development of Patient Specific Dental Implant on Indian Perspective – **University Grant Commission, India - Principal Investigator**
6. Development of Bone Condition Monitoring Technique using Ultrasonographic Sensor – **Dept. of Sc & Technology (Govt. Of India) Principal Investigator.**
7. Patient Specific Shoe Bed Designing for Diabetic Patient **Dept. of Sc & Technology (Govt. Of India) Principal Investigators.**
8. Translational centre for development of orthopaedic and dental implants **DBT (Govt of India) India one of the Principal Investigator**
9. Design and Manufacturing of patient specific dental implant: **Dept. of Sc & Technology (Govt. Of India) Principal Investigator.**

## **Co-investigator of other eight projects.**

### **Paper Published In Journals :**

#### **Journal Publication list**

1. S Pal, A Roychowdhury(1995). Contour affects the stress and tribology of knee prosthesis. *Engineering in Medicine and Biology Society,1995 and 14th Conference of the ...*
2. Roychowdhury, A. and Pal, S., (2000) "A 3D FEM Analysis of Single and Multiple screw root Dental Implant fixed in Mandible", *Critical Review™ of Biomedical Engineering, Vol.48. pp. 405-410.*
3. Roy Chowdhury, A. and Pal, S., (2000) "Stress Analysis of an Artificial Temporal Mandibular joint", *Critical Review™ of Biomedical Engineering, Vol.49.pp. 411-420.*
4. Roy Chowdhury, A., Pal, S. and Saha, S. (2001), "Finite Element Analysis of an Artificial Temporal Mandibular joint" *Automedica, Vol. 20, pp. 283-295.*
5. Majumder, S., Roy Chowdhury, A. and Pal, S. (2004), "Dynamic response of the pelvis under side impact load – a three-dimensional finite element approach." *International Journal of Crashworthiness, Vol. 9 (1), pp. 89-103.*
6. Roy Chowdhury, A. Pal, S., Gupta, S., and PEC Vidyasagar (2004), "Wear Studies of Frequently Used Material for Implant Designing", *Trends in Biomaterials & Artificial Organs, Vol. 17 (2), pp. 130-134.*
7. Majumder, S., Roy Chowdhury, A. and Pal, S. (2004), "Variations of stress in pelvic bone during normal working, considering all active muscles." *Trends in Biomaterials & Artificial Organs, Vol. 18 (2), pp. 48-53.*
8. Sarkar, S., Majumder, S. and Roy Chowdhury, A. (2004), "Response of human head under static & dynamic load using finite element method." *Trends in Biomaterials & Artificial Organs, Vol. 17(2), pp. 130-134.*
9. Majumder S., Roychowdhury A. and Pal S., (2005)"Biomechanical analysis of human pelvis under musculo-skeletal load using 3D finite element method." *International Journal of Applied Mechanics and Engineering, Vol. 10, pp. 647-665.*
10. Majumder S., Roychowdhury A. and Pal S., (2005) "An algorithm to calculate the components of all muscle forces during each phases of gait cycle, for the pelvic-femur complex. *Journal of Mechanics in Medicine and Biology, Vol. 5, pp. 539-548.*

11. Nandi N, Dutta S. C, Roychowdhury A. , (2005) "Analysis of shear failure of earthen dam" *Dam Engineering, Vol .(4),pp. 252-282.*
12. Sahoo, A., Ghosh A., Roy Chowdhury, A., (2005). Stress analysis of cracked and fractured femur with fixing plate using finite element method. *Journal of the Institute of Engineers (India), Vol. 86, pp. 24-29.*
13. S Majumder, S Sarkar, A Roychowdhury, S Pal (2005). CT Scan Based Reconstruction of 3D Images for Realistic Analysis by Finite Element Method. *Advances in Medical Diagnostic Techniques and Procedures, Vol. 169*
14. Majumder,S., Roychowdhury,A., Pal,S.,(2006) Finite element simulation of pelvis during a backward fall (Abstract) *Journal of Biomechanics,Vol. 39 suppl1*
15. Sarkar,S., Roychowdhury,A.,(2006) Finite element simulation of head during a frontal impact *Journal of Biomechanics,Vol. 39 suppl1*
16. S Sarkar, UB Ghosh, A Roychowdhury (2006). A simple logic based method for segregation of grey matter and white matter in 3D finite element human head model from CT scan data. *Journal of Biomechanics Vol 39 S 427*
17. Majumder S., Roychowdhury A. and Pal S., (2007) 'Simulation of hip fracture in sideways fall using a 3D finite element model of pelvis-femur-soft tissue complex with simplified representation of whole body. *Medical Engineering and Physics,Vol. 29(10) pp. 1167-1178*
18. Kaiser M.S., Datta S., Roychowdhury A. and Banerjee M.K. (2007).Age hardening behavior of wrought Al-Mg-Sc alloy. *Materials & Manufacturing Processes, Taylor & Francis. Vol. 13(2), pp. 29-41.*
19. Lenka,P., Daripa,R., Kumar,R., Roychowdhury,A., Tibarewala,D.N., (June,2007)Stress Analysis of BK Prosthesis with Finite Element Method,. *Indian Journal of Biomechanics, Vol.1, No.1,pp. 75-82.*
20. Kaiser, M.S., Datta,S.,Roy Chowdhury A., Banerjee,M.K., (2007) Ageing effect of ternary and quaternary additions on the fracture toughness behaviour of cast Al-Mg alloys –*Journal-Institution of Engineers India Part Mm Metallurgy And Material, Vol. 88 October, pp. 3-9.*
21. Kaiser, M.S.,Datta,S.,Roychowdhury A., Banerjee,M.K., (2008) Age hardening behaviour of wrought Al-Mg-Sc alloy. *Materials and Manufacturing Processes, Vol. 23(1),pp.74-81.*
22. Kaiser, M.S., Datta,S.,Roy Chowdhury A., Banerjee,M.K., (2008). Effect of scandium on the microstructure and ageing behavior of cast Al-6Mg alloy.*Accepted for publication in Materials Characterization.*
23. MS Kaiser, S Datta, A Roychowdhury, MK Banerjee (2008) Effect of Scandium additions on the tensile properties of cast Al-6Mg alloys. *Journal of materials engineering and performance Vol. 17 (6), page 902-907*
24. Majumder, S., Roychowdhury, A., Pal, S., (2008) Three-dimensional finite element simulation of pelvic fracture during side impact with pelvic-femur-soft tissue complex. *International journal of Crashworthiness. (Taylor & francis) Vol 13 (3) pp. 313-329.*

25. S Majumder, A Roychowdhury, S Pal (2008). Experimental validation of three-dimensional finite element model of pelvis-femur-soft tissue complex under side impact loading. *International Journal of Vehicle Safety Vol 3(2), page 117 – 134*
26. Majumder, S., Roy Chowdhury, A. and Pal, S (2008) Effects of trochanteric soft tissue thickness and hip impact velocity on hip fracture in sideways fall through 3D finite element simulations, *Journal of Biomechanics Vol. 41(13) pp 2834-2842.*
27. Sahoo, A., Ghosh, A., Roy Chowdhury A., (2008) Optimum angle of screw for fixing plate of fractured Femur. *Indian Journal of Biomechanics (India), Vol. 2, pp. 24-29.*
28. Roy, T., Roy Chowdhury, A., (2008) Fatigue analysis of implanted dental screw using. *Indian Journal of Biomechanics (India), Vol. 1., pp. 30- 36*
29. Lenka,P.K., Roy Chowdhury,A., Kumar,R. (2008)Design & Development of Lower Extremity Paediatric Prosthesis, a Requirement in Developing Countries. *Journal of Physical Medicine & Rehabilitation Vol.19(1):pp. 8-12.*
30. MS Kaiser, S Dutta, A Rouchowdhury, MK Banerjee. (2008) Effect of scandium on the microstructure and ageing behavoiur of cast Al-6Mg alloy. *Materials Characterization Vol. 59 (11), page 1661-1666*
31. S Majumder, A Roychowdhury, S Pal (2008). Finite element study of side impact on pelvis with car door padding. *International Journal of Vehicle Safety Vol 3(4), page 338–350*
32. S Majumder, A Roychowdhury, S Pal (2008). Effectiveness of a foam type hip pad in reduction of hip fracture: a 3D finite element study. *Journal of Biomechanics Vol 41 S 453*
33. A Deb, S MAjumder, A Roychowdhury (2008). Biomechanical study of the lumbar spine with and without implant: a finite element approach. *Journal of long-term effects of medical implants Vol. 18 (4)*
34. S Sarkar, A Roychowdhury, U Ghosh (2008). Prediction of subdural hematoma based on a 3D finite element human head model. *International journal of vehicle safety Vol. 3 (3) page 276-294*
35. Ghosh,U.B., Sengupta,D., Roychowdhury,A., Pal,S.,(2009) Biomechanical Analysis of CT-Scan based Custom made Hip Prosthesis with an Optimal Hip Ball Using FEA, *Journal of long term effects of Medical Implants. Vol.19(1): pp. 31-41.*
36. Roychowdhury,A., Saha,S.,(2009) Application of FEM in orthopadeic implant design.*Journal of long term effects of Medical Implants. Vol.19(1) pp. 55-83*
37. Roychowdhury,A., Hayes,W.,Saha,S.,(2009) Proposed Frequencies of a Vibrator Used for Implant retrieval at the time of Hip Joint Revision Surgery. *Journal of long term effects of Medical Implants. Vol.19(2): pp. 157–165.*
38. S Majumder, A Roychowdhury, S Pal. (2009) Effect of body configuration on pelvic injury in backward fall simulation using 3D finite element models of pelvis-femur-soft tissue complex. *Journal of biomechanics Vol. 42(10) page 1475–1482*
39. A Roychowdhury, W Hayes, VJ Rasquinha, S Saha (2009). Proposed Frequencies of a Vibrator Used for Implant Retrieval at the Time of Hip Joint Revision Surgery. *Journal of long-term effects of medical implants Vol. 19 (2), page 157-165*

40. Kashi, A., Chowdhury, A.R. and Saha, S., 2010. Finite element analysis of a TMJ implant. *Journal of dental research*, 89(3), pp.241-245.
41. Roychowdhury,A., Kashi,A., Saha,S., (2010)Patient specific optimization of TMJ Implant. *Journalof Biomechanics Vol. 44(3) pp. 241-247,*
42. A Roychowdhury, A Kashi, S Saha. (2011) A comparison of stress distributions for different surgical procedures, screw dimensions and orientations for a Temporomandibular joint implant. *Journal of biomechanics Vol. 44(14) page 2584 – 2587*
43. Maji, P., RoyChowdhury, A., Datta, D., (2012) Investigating the morphology of the proximal femur of the Indian population towards designing more suitable THR implants. *Journal of long term effects of medical implants. Vol.22(10.1615), pp. 49-64.*
44. Banerjee, P.S., Karmakar, S., RoyChowdhury, A. (2012) Biomechanical remedies for degeneration of cervical spine – A review of literature.*Journal of medical imaging & health Informatics. Vol. 2 page 343 - 351*
45. Banerjee, P.P., Karmakar, S., RoyChowdhury, A., 2012. Measurement and Analysis of Morphological data of Cervical Spine for Indian population.*Journal of Medical & Allied Sciences.Vol(2), Issue-2, pp. 66-76.*
46. Biswas, J.K., Karmakar, S.K., Majumder, S., Roychowdhury, A., 2012. A finite element study of spinal implant (pedicle screw) design for lumber (L3 - L5) vertebra. *Indian journal of biomechanics Vol. 3(1-2), pp. 50-60.*
47. Banerjee P.S., Roychowdhury A., Karmakar S. K. (2012) Morphometric analysis of the cervical spine of Indian population by using computerized tomography. *Journal of Medical & Allied Sciences Vol. 2 (2) page 66 – 76*
48. Banerjee P.S., Roychowdhury A., Karmakar S. K. (2013) Morphological and Kinematic aspects of Human Spine – As design inputs for developing Spinal Implants. *Journal of Spine Vol 2 (4)*
49. S Majumder, A Roychowdhury, S Pal (2013). Hip fracture and anthropometric variations: dominance among trochanteric soft tissue thickness, body height and body weight during sideways fall. *Clinical Biomechanics Vol. 28 (9), page 1034 – 1040*
50. PK Maji, A Roychowdhury, D Datta (2013). Minimizing Stress Shielding Effect of Femoral Stem—A Review. *Journal of Medical Imaging and Health Informatics Vol. 3 (2), 171-178*
51. MS Kaiser, S Datta, PP Bandyopadhyay, A Guha, A Roychowdhury (2013). Effect of Grain Refinement through Minor Additions of Scandium and Zirconium on the Machinability of Al–Mg Alloys. *Journal of The Institution of Engineers (India): Series D Vol. 94 (1), page 17-24*
52. Biswas, J.K., Karmakar, S.K., Majumder, S., Banerjee, P.S., Saha S., Roychowdhury, A. (2014) Optimization of Spinal implant screw for lower vertebra through finite element study. *Journal of long-term effects of medical implants.Vol. 24(2-3) page 99-108*
53. MS Kaiser, S Datta, A Roychowdhury, MK Banerjee (2014). Effect of prior cold work on tensile properties of Al-6Mg alloy with minor scandium additions. *Canadian Metallurgical Quarterly Vol 53(4), Page 486 - 493*

54. Banerjee P.S., Pradhan R., Roychowdhury A., Karmakar S. K. (2015) Investigation of stresses developed in natural and implanted human cervical spine by Finite Element Method. *Journal of Advanced Medical and Dental Sciences Research* Vol. 3 (1) page 9 – 18
55. S Chatterjee, S Majumder, A Roychowdhury, S Pal (2016). Review: Problems with use of Trans-Tibial Prosthesis. *Journal of Medical Imaging and Health Informatics* Vol 6 (2) page 269 - 284
56. Sandipan Roy, Debojyoti Panda , Arunava Deb, Sauradeep Bhowmick, Niloy Khutia, Amit RoyChowdhury -Optimization of Effective Modulus and stress concentration for different Pore geometries of Titanium Materials, , *The Indian journal of Biomechanics*.
57. Sandipan Roy, Debojyoti Panda, Niloy Khutia, Amit RoyChowdhury. Pore geometry optimization of titanium (Ti6Al4V) alloy for its application in the fabrication of customized hip implants. *International Journal of Biomaterial*. Vol. 4 page 445
58. A Roychowdhury. Application of the finite element method in orthopedic implant design. *Journal of long-term effects of medical implants* Vol 19 (1) 55-83.
59. Nandi, N., Chandra Dutta, S. and Roychowdhury, A., 2010. Explanation of seismic failure possibilities through dynamic and response analysis of earthen dams. *Dam Engineering*, 21(1), p.45.
60. Sarkar, S., Roychowdhury, A., Experimental validation of 3D finite element model of Human skull brain complex under impact loading; *International Journal of Vehicle Safety*; (Accepted).
61. Roy, S., Dey, S., Khutia, N., Chowdhury, A.R. and Datta, S., 2018. Design of patient specific dental implant using FE analysis and computational intelligence techniques. *Applied Soft Computing*, 65, pp.272-279.
62. Majumder, S., Chowdhury, A.R. and Saha, S., 2016. Electromagnetic Response of Bones Adjacent to the Dental Root Before and After Dental Implantation. *Journal of long-term effects of medical implants*, 26(4). 295-302
63. Roy, S., Khutia, N., Das, D., Das, M., Balla, V.K., Bandyopadhyay, A. and Chowdhury, A.R., 2016. Understanding compressive deformation behavior of porous Ti using finite element analysis. *Materials Science and Engineering: C*, 64, pp.436-443.
64. Roy, S., Das, M., Chakraborty, P., Biswas, J.K., Chatterjee, S., Khutia, N., Saha, S. and RoyChowdhury, A., 2017. Optimal selection of dental implant for different bone conditions based on the mechanical response. *Acta of bioengineering and biomechanics*, 19(2): 11-20.
65. Biswas, J.K., Rana, M., Majumder, S., Karmakar, S.K. and Roychowdhury, A., 2018. Effect of two-level pedicle-screw fixation with different rod materials on lumbar spine: A finite element study. *Journal of Orthopaedic Science*. 2018 Mar;23(2):258-265.
66. Biswas, JK., Banerjee, S., Majumder, S., Roy, S, Saha, S., RoyChowdhury, A. 2018. Effect of Pedicle-Screw Fixation in Lumbar Spine at L3-L5 Level: A Finite Element Study. *Journal of the Mississippi Academy of Sciences*, 63(2), 266-274.



67. Sahoo, A., Majumder, S. and Roychowdhury, A., 2017. Car occupant response: finite element analysis of knee-thigh-hip complex under frontal impact. *International Journal of Vehicle Safety*, 9(4), pp.311-327.
68. Paul, S., Pal, A., Choudhury, A.R., Bodhak, S., Balla, V.K., Sinha, A. and Das, M., 2017. Effect of trace elements on the sintering effect of fish scale derived hydroxyapatite and its bioactivity. *Ceramics International*, 43(17), pp.15678-15684.
69. Pal, A., Maity, S., Chabri, S., Bera, S., Chowdhury, A.R., Das, M. and Sinha, A., 2017. Mechanochemical synthesis of nanocrystalline hydroxyapatite from Mercenaria clam shells and phosphoric acid. *Biomedical Physics & Engineering Express*, 3(1), p.015010.
70. Pal, Anindya, Sudeep Paul, Amit Roy Choudhury, Vamsi Krishna Balla, Mitun Das, and Arijit Sinha. "Synthesis of hydroxyapatite from Lates calcarifer fish bone for biomedical applications." *Materials Letters* 203 (2017): 89-92.
71. Kumar, P. and Choudhury, A.R., 2016. A Brief Review on Grain Refinement In Steel Through Dynamic Strain Induced Transformation. *Journal of Materials Science & Surface Engineering* 4: 436-443.
72. Kumar, P. and Choudhury, A.R., 2016. Precipitation of Copper and Grain Refinement in Low Carbon Steel in Hot Rolling, *Journal of Materials Science & Surface Engineering* 5:428-431.
73. Kumar, P., Banerjee, M.K., Hodgson, P. and Choudhury, A.R., 2016. Dynamic Re-Crystallization of Low Carbon Steel in Plain Strain Condition. *International Journal of Mechanical Engineering and Robotics Research*, 5(2), p.160.
74. Talukdar R.G., Das M., Majumder S., Choudhury, A.R., 2015 Optimization of Solid UHMWPE with porosity as an cervical disc implant. *International Journal of Applied Engineering Research* 10(S11): 10511–10515

**More than Ninety nos of paper is accepted and presented in different National & International Conference**

### **Consultancy Jobs:**

***More than Fifty consultancy jobs were successfully completed.***

#### **Name of a few reputed clients**

- ***Larsen & Tubro - : To design a stacker reclaimer , total Heavy roller (Finite Element and Kinematic analysis )***

- *ESAB -: Fixture Design to hold Railways engine at the time of Manufacturing*
- *General Electric -: To design & Analysis a Industrial Fan (different shapes and sizes)*
- *TATA iron & steel Co -: Pipe line stress analysis work, Chimney Design*
- *ABS , USA -: Static and dynamic analysis of Different components of ship structure, Failure analysis of different components, Foundation design of pumps and Motors.(Consultancy was provided by their Indian Agents).*
- *Hindusthan Zinc Ltd & Vedanta -: Static & Dynamic Analysis of 45m, 75m & 110m Chimney*
- *P.T.Heat exchangers, Indonesia -: Analysis of heat exchanger panels*
- *Paharpur Cooling tower -: Design & analysis of different type platforms for cooling towe .*
- *Calcutta Electric Supply Co (CESC)-: Analysis of a 80 years old tunnel & and its attached cable holding structure which is laid under the Ganges River.*
- *Darjeeling Ropeway System- Analysis Inspection and Consultation.*

### **Relevant Industrial Experience**

- **Senior consultant (1995(April)-1997 (November)), Research Engineers Inc**
- **(Responsibility- : Support and development of FEMAP-Stardyne (A FEA package), Support to the ADLPIPE (a pipe stress analysis package) and STAAD- III (a structural design package))**