

**SUDESH SIVARASU Ph.D**

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[sudesh.sivarasu@gmail.com](mailto:sudesh.sivarasu@gmail.com)[sudesh.sivarasu@uct.ac.za](mailto:sudesh.sivarasu@uct.ac.za)**Education :**

Sl.No	Degree	Specialization	University	Class	Percentage	Year
1.	Ph.D	Biomedical Engineering	VIT University	-	-	2009
2.	M.Tech	Biomedical Engineering	VIT University	I	79.6	2006
3.	B.E	Electronics & Instrumentation Engineering	Madras University	I	77.02	2004

**Professional Work Experience & Current Position:**

**Associate Professor – Biomedical Engineering,**  
*Head - Biomechanics & Medical Devices Research Group,*  
 Division of Biomedical Engineering,  
 Department of Human Biology, Faculty of Health Sciences,  
 University of Cape Town, Cape Town, South Africa 7925

**International Adjunct Lecturer – Global Health & Technologies,**  
 School of Professional Studies, Northwestern University, Chicago, USA

Sl.No	Title	Institute	From	To	Job Roles
1.	<b>Associate Professor</b>	University of Cape Town, Cape Town South Africa	Jan – 2018	Till Date	Teaching & Research
2.	<b>Senior Lecturer</b>	University of Cape Town, Cape Town South Africa	Jan – 2015	Dec - 2017	Teaching & Research
3.	<b>Lecturer</b>	University of Cape Town, Cape Town South Africa	Feb – 2011	Dec - 2014	Teaching & Research
4.	<b>Associate Professor</b>	VIT University, Vellore, India	Apr – 2009	Feb - 2011	Teaching & Research
5.	<b>Research Analyst</b>	RR Donnelley / Pfizer, Chennai, India	Apr – 2008	Apr – 2009	Research
6.	<b>Research Analyst</b>	Frost & Sullivan, Chennai, India	Jul – 2006	Mar – 2008	Research

**Field interests:**

- Medical Devices Design; Assistive Technology; Orthopedic devices  
Rehabilitation Engineering, Bio-Mechanics,

**Research Experience:****Students Supervision / Guidance:**

	Present	Graduated
Ph.D	<b>4</b>	<b>2</b>
MSc. / M.Tech	<b>9</b>	<b>14</b>
B.Eng/ Hons	<b>1</b>	<b>6</b>
Post-Doctoral Researcher	<b>1</b>	<b>NA</b>

**Publication Table:**

Category	Numbers
Patents Family Applications	<b>18</b>
Granted Patents	<b>6</b> <b>2 - UK, 3-RSA, 1 -USA</b>
Peer – Reviewed International Journal Publications	<b>38</b>
National / International Conference Publications	<b>36</b>
Abstracts Published	<b>7</b>
Invited Lectures / Guest Lectures	<b>11</b>
Open Source Innovations	<b>2</b>

**Research Awards & Recognitions [16]:**

- **UCT – College of Fellows – Young Researcher Awards, 2017**
- **DST's 2017 Award for 'Innovation most likely to find markets nationally/ internationally'** on 'Additive Manufactured Medical Devices' platform at the Innovation Bridge 2017.
- UCT's Deputy Vice Chancellor's **Award for Achievement in Innovation, 2017**
- Selected by Mail & Guardian as one of **200 Young South Africans** for achievement in the field of Science and Technology in 2017 (<http://200ysa.mg.co.za/2017/dr-sudesh-sivarasu/> )

- **TW Kambule-NSTF Awards: Emerging researcher** (2016) – by NSTF, South Africa & South 32
- **MEIBioEng2016 Poster Prize** for Best Poster in Affordable Health Technologies meeting organized by IET, UK and University of Oxford, 2016
- **NSTF Finalist 2016** under 2 categories; TW Kambule-NSTF Awards: Emerging Researchers, and Research Leading to Innovation by a Corporate Organization
- **Claude Leon Merit Award for Early-Career Researcher**, 2016
- **Y rated** Scientist from National Research Foundation, South Africa, 2016-2021
- **Philips Innovation Fellows Competition Finalist 2015**, conducted by Philips and Innovation Hub South Africa.
- 3rd place in '**Emerging Medical Innovation Competition**' conducted by Medical Industry Leadership Institute, Carlson School of Management, University of Minnesota in Design of Medical Devices Conference, Minnesota, USA, April 2015. Prize is worth \$15,000 worth Valuation report by MILI, USA.
- "**Customized foot orthosis for Leprosy Patients**" was selected as one of the **TOP 50 Innovations** throughout India by India Innovation Growth Programme conducted by DST, Lockheed Martin Corporation, Indo-US Science and Technology Forum, Stanford Graduate School of Business and the University of Texas at Austin, March 2015.
- **1<sup>st</sup> Prize for Poster Presentation** entitled '**Smart Pill Dispenser**' in the category of IT solutions during IKMC2014: Innovating to Improve Lives" held on Nov 3 to 4, 2014 at HICC, Hyderabad, India
- Featured in **BBC World News - Health Check programme** for my research on Leprosy glove.
- Received the '**Young Scientist Award**' for '**The Best Oral Presentation**' on the **Disability and Impairment** theme during the 18th International Leprosy Congress held in Brussels, Belgium, September, 2013
- Received **Best Performer** of the research team Pfizer in RR Donnelley, 2008.

**Ongoing Funded Projects:**

Sl. No.	Sponsored Project Title & Role	Role	Funding Agency	Amount (ZAR) Thousands	Period
1.	Orthopedic Biomechanical Devices	Principal Investigator	National Research Foundation, South Africa	1,332	2014-2017
2.	Point of Care (PoC) diagnostics for early TB detection	Co-Principal Investigator	Strategic Health Innovation Programme, SHIP, Medical Research Council South Africa	3,195	2014-2017
4.	Design and Prototype Development of a Novel Shoulder Implant Used in Total Shoulder Arthroplasty – Considering Dual Curvature Gleno-Humeral Articulation	Co-Principal Investigator	MRC – Self Initiated Research	480	2014-2017
5.	Claude Leon Merit Award – Laxmeter Pre-clinical trials	Principal Investigator	Claude Leon Foundation	50	2016
6.	NSTF Emerging Researcher Award PatRig PreClinical Trials	Principal Investigator	NSTF & South 32	30	2016
7.	Laxmeter V2.0 Development	Principal Investigator	UCT – URC	20.5	2016
8.	Adrenaline Auto Injector Development	Principal Investigator	UCT – URC	13.1	2016
9.	PatRig – Pre Clinical Trials	Principal Investigator	UCT – URC	18	2016-2017
10.	Adrenaline Auto Injector Development	Principal Investigator	DST – TIA PreSeed Grant	494	2017-2018
11.	Smart Prosthetic Fit System	Principal Investigator	UCT – URC	19	2017-2018
12.	Additive Manufactured Medical Devices	Principal Investigator	Department of Science and Technology (DST)	50	2017
13.	NRF Rated Researchers Incentive	Principal Investigator	National Research Foundation, South Africa	200	2016-2020
<b>Total</b>				<b>R 5.901 million</b>	

**BME Capacity Building Funding:**

Sl. No.	Sponsored Event	Funding Agency	Role	Amount
1.	Capacity Building of Biomedical Engineering Training and Research	COI, NICHE	Collaborator	€917,708 (2015-2017)
2.	Teaching and Research Capacity Building in Biomedical Engineering	COI, NICHE	Collaborator	€1,179,536 (2015-2017)
<b>Total</b>				<b>€2,097,244</b>

**Conference Travel Grant Awarded:**

Sl. No.	Sponsored Event	Funding Agency	Amount (in ZAR)
1.	XXVI Congress of the International Society of Biomechanics, Brisbane Australia, July 2017	UCT-URC Travel Grant	20,000 (2017)
2.	XXVI Congress of the International Society of Biomechanics, Brisbane Australia, July 2017	NRF – KIC Travel Grant	19,000 (2017)
3.	6th Annual Digital Medicine Academic Meeting of Chinese Medical Association and the 1st International Conference of Digital Medicine & Medical 3D Printing, Nanjing China, June 2016	NRF – KIC Travel Grant	25,000 (2016)
4.	37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) Milano, Italy, August 25th-29th, 2015	UCT-URC Travel Grant	17,000 (2015)
5.	48 <sup>th</sup> DGMT Annual BMT conference, Hannover, Germany	NRF – KIC Travel Grant	30,000 (2014)
6.	ASME/FDA 1 <sup>st</sup> Conference on Frontiers in Medical Devices Conference: Applications of Computer Modeling and Simulation - FMD2013, Washington D.C, USA	NRF – KIC Travel Grant	35,000 (2013)
7.	Design of Medical Devices Conference, Minneapolis, USA	UCT-URC Travel fund	31,500 (2013)
<b>Total Conference Travel Awarded</b>			<b>ZAR 177,500</b>

**Funded Projects Completed:**

	Sponsored Project Title	Collaborating Agency	Funding Agency	Amount (in ZAR) Millions:	Period	Status
1.	'Smart Pill Box' for TB medication adherence	Co-Principal Investigator	Bill & Melinda Gates Foundation, USAID & IKP	345	12 Months (2014-2015)	Completed
2.	Wireless Flexible Endoscope	Collaborator	Medical Device Innovation Programme(MDIP), Medical Research Council, South Africa	240	3 years (2012-2014)	Completed
3.	PatRig – Patellofixator device	Principal Investigator	UCT Startup Grant	20	6 Months 2015	Completed
4.	reScribe - Orthotic Exoskeleton for fine motor rehabilitation	Principal Investigator	UCT Research & Development Grant	39	12 Months 2015	Completed

5.	Modified pediatric metered dosage inhaler	Principal Investigator	UCT – Pre-seed funding	20	6 months (2014)	Completed
6.	Novel Laxity measurement device	Principal Investigator	UCT – Pre-seed funding	20	6 months (2013)	Completed
<b>Total</b>				<b>R 684,000</b>		

## List of Publications/ Patents: Sudesh Sivasasu

### Patents & Publication

Category	Numbers
Patents Family Applications	<b>18</b>
Granted Patents	<b>6</b> 2 - UK, 3-RSA, 1 -USA
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Invited Lectures / Guest Lectures	<b>11</b>
Open Source Innovations	<b>2</b>

### Patents Family Applications: [18]

1. *Edmund Wessels, Sudesh Sivasasu – Endoscopic Device*
  - British Patent GB1803497.5, 05/03/2018
2. *Mike Levin, Gokul Nair, Sudesh Sivasasu - An Auto-Injector*
  - British Patent: GB1703982.7 13/03/2017
  - PCT: PCT/IB2018/051623 13/03/2018
3. *Sudesh Sivasasu, Giancarlo Lanfranci Beukes, Jason Dirk Voorneveld & Michael Levin - An Assistive Device for an Inhaler*
  - British Patent: GB1604709.4 21/03/2016
  - PCT/IB2017/051462 14/03/2017
4. *Sarthak Patnaik & Sudesh Sivasasu- Anatomical Support Facilitating Medical Imaging of the Hip, Leg and Knee [ Laxmeter]*
  - **British Patent: GB2520046 [Granted] 14 Dec 2015;**
  - **US Patent no: 9,211,098 [Granted] 15 Dec 2015;**
  - **RSA Patent no. 2014/08083 [Granted] 24 Nov 2015;**
  - Indian Patent 113/KOL/2014;
5. *Sudesh Sivasasu, Sarthak Patnaik - Accessory for Conducting Patella Surgery [PatRig]*
  - British Patent Reference no: GB1511597.5 (2015) – 02/07/2015
  - PCT Patent: PCT/IB2016/053967 (2016) – 01/07/2016

- European Patent: EP16735944.7 (2018) – 31/01/2018
  - China Patent: CN201680045677.4(2018) – 02/02/2018
  - South African Patent: ZA2018/00593 (2018) – 29/01/2018
  - Indian Patent: IN201837003152(2018) – 27/01/2018
  - US Patent: 15/741223(2017) – 29/12/2017
6. *Keertan Unkha Jairam Dheda, Grant de vos Theron, Lester Ryan John & **Sudesh Sivarasu*** – Method and Device to Monitor Infectious Patients (Dheda Superspreader Mask)
- British Patent: GB1407666.5 (2014) 01/05/2014
  - PCT: PCT/IB/2015/053143 (2015) 30/04/2015
  - Indian Patent: IN201637040251 24/11/2016
  - **British Patent: GB2525643 [Granted] 06 Oct 2016**
  - **South African Patent: 2016/07894 [ Granted ] 20 Dec 2017**
7. *Brijlal Y, John LR, **Sivarasu S.*** Hand Exoskeleton.
- South African Patent 2012/08238 01/11/2012
  - PCT: PCT/IB2013/059809 31/10/2013
  - European Patent: EP13824005.6 29/04/2015
  - China Patent: CN201380057411.8 30/04/2015
  - South Africa National Phase (2015/02680) 21/04/2015
  - **South Africa Patent: 02680/2015 [Granted] 29 June 2016**
8. *Bindu Salim, **Sudesh Sivarasu**, Sridhar Cuddalor Parthasarthy, Rajasekharan Soumya, Sriram Krishnan, Thalakotur Lazar Mathew*, System for Dispensing Pills
- Indian Patent: 841/CHE/2015 23/02/2015
9. *Sathish Kumar Paul, Rekha V & **Sudesh Sivarasu*** – Comprehensive Injury Detection and Prevention Tool for Leprosy Affected Patients.
- Indian Patent :1540/CHE/2014
10. *Sharmila Nageshwaran, Rekha V, **Sudesh Sivarasu*** - Intelligent pressure shifting cushion to prevent decubitus ulcers in non-ambulatory patients.
- Indian Patent : 1417/CHE/2014
11. *Preethika Britto, Rekha V, **Sudesh Sivarasu*** – Rehabilitative Robotics for Mobility Assistance for Paraplegics,
- Indian Patent : 923/CHE/2012
12. *Jyoti Gupta, **Sudesh Sivarasu*** – Heart Valve Implant – Hollow Occluder Ball within Square Strut
- Indian Patent: 1561/CHE/2011
13. *K.e.ch. Vidyasagar, **Sudesh Sivarasu*** - Mobile Controlled Multidrug Infusion System,
- Indian Patent: 3996/CHE/2010
14. *K.e.ch. Vidyasagar, **Sudesh Sivarasu***- Mobile Controlled Drug Delivery System,
- Indian Patent : 3150/CHE/2010
  - **Granted Patent No. 288750 28/10/2017**

15. **Sudesh Sivarasu, Lazar Mathew** – Novel Techniques for Low Weight Orthopedic Implant Development
  - Indian Patent: 1821/CHE/2010; (Indian Patent Office)
16. **Sudesh Sivarasu, Sathish Kumar Paul, Martins Mathew, Lazar Mathew** – Customized Foot Orthosis Development by 3 Dimensional Reconstruction of CT Images.
  - Indian Patent: 1819/CHE/2010 (Indian Patent Office)
17. **Sudesh Sivarasu, Preethika Britto, Lazar Mathew** –Wheel Chair Automation Sensing Eyeball and Shoulder Kinematics,
  - Indian Patent: 212/CHE/2010 (Indian Patent Office)
18. **Sudesh Sivarasu, Pearline Beulah, Lazar Mathew** – Skeletal Hip for Total Hip Arthroplasty
  - Indian Patent: 211/CHE/2010 (Indian Patent Office)
19. **Sudesh Sivarasu, Lazar Mathew** – Artificial Knee for Eastern Lifestyles Application
  - Indian Patent: 160/CHE/2009 (Indian Patent Office)

### **Papers Published in International Peer Reviewed Journals [39]**

1. Dey, R., Roche, S., Rosch, T., Mutsvangwa, T., Charilaou, J., & Sivarasu, S. (2018). Anatomic variations in glenohumeral joint: an interpopulation study. *JSES Open Access*, 2(1), 1-7.
2. Saidi, T., Sivarasu, S., & Douglas, T. S. (2018). Open source modular ptosis crutch for the treatment of myasthenia gravis. *Expert review of medical devices*, 15(2) 137-143. (IF: 2.228)
3. *Milandri, Giovanni, Mike Posthumus, T. J. Small, Adam Bothma, Willem van der Merwe, Reshma Kassanjee, Sudesh Sivarasu.* - Kinematic and kinetic gait deviations in males long after anterior cruciate ligament reconstruction. *Clinical Biomechanics* (2017). 49 pp. 78-84 [1.874]
4. *Sathish Kumar Paul, Rekha V, Martins Mathew, Lazar Mathew, Sudesh Sivarasu* - Finite Element Model Based Evaluation of Tissue Stress Variations to Fabricate Corrective Orthosis in Anesthetic Feet with Neutral Subtalar Joint, *Prosthetics & Orthotics International*, 41 (2) (2017) pp. 157-163(IF: 1.014)
5. *Ofentse Noko, Ariel Lashansky, Giancarlo Beukes, Sudesh Sivarasu* - An Open Source Biometric Patient Identification System for a Low Resource Setting. *Journal of Medical Devices: ASME transactions*, 2017, Vol.11(3) : DMD2017-3477. (IF .68) [ Paper in Press]
6. *Giancarlo Beukes, Mike Levin, Sudesh Sivarasu* - The Paediatric Metered Dosage Inhaler (PMDI) Sleeve Attachment. *Journal of Medical Devices: ASME transactions*, 2017, Vol.11(3) : DMD2017-3459. (IF .68) [ Paper in Press]
7. *Roopam Dey, Sarthak Patnaik, Sudesh Sivarasu* - Novel Device to Accurately Locate Femoral Insertion Landmark in Medial Patellofemoral Ligament (MPFL) Reconstruction.

- Journal of Medical Devices: ASME transactions*, 2017, Vol.11(3) : DMD2017-3500. (IF .68)  
[ Paper in Press]
8. Megan Findlay, Jeanine Heckmann, **Sudesh Sivarasu** - A modular and adjustable ptosis crutch as a non-surgical, low cost solution for elevating the upper eyelid in Myasthenia Gravis, *Ergonomics SA*, 28 (2) (2016) pp. 49-60
  9. Chipu Chimhundu, **Sudesh Sivarasu**, Stefan Steiner, Julian Smith, Tania Douglas - Femoral Neck Anteversion Measurement Using Linear Slot Scanning Radiography, *Medical Engineering & Physics*, 38 (2016) pp 187-191 (IF: 1.825)
  10. Megan Findlay, Jeannine Heckmann, **Sudesh Sivarasu** - Three-Dimensional Printed Patient Specific Ptosis Crutches as a Nonsurgical Solution for Elevating Upper Eyelids in Myasthenia Gravis Patients *Journal of Medical Devices: ASME transactions*, 2016, Vol.10(2) :020929-020931-2. (IF .68)
  11. Roopam Dey, Sarthak Patnaik, Stef Steiner, **Sudesh Sivarasu** - Low-Cost Three-Dimensional Printed Surgical Drill-Guiding Device for MPFL Reconstruction (Pat-Rig) *Journal of Medical Devices: ASME transactions*, 2016, Vol.10(2) :020914-020917-2. (IF .68)
  12. Opiyo, Albert, Yasheen Brijlal, and **Sudesh Sivarasu**. "Wireless System for Hand Motor Therapy Toward Telerehabilitation in Stroke." *Journal of Medical Devices: ASME Transactions* Vol. 10, no. 3 (2016): 030922.
  13. **Sudesh Sivarasu**, Sarthak Patnaik - Novel Stress Radiography Device for Measuring Knee Laxity at Various Flexion Angles – Laxmeter, *Journal of Medical Devices: ASME transactions*, 2014, Vol.8(2) :020938-020938-2.MED-14-1024 (IF .68)
  14. Satish Kumar Paul, Rekha V, **Sudesh Sivarasu** – Customized Insole Fabrication for Foot Deformities in Leprosy Patients, *Journal of Medical Devices: ASME transactions*, 2014, Vol.8(2) 8(2):020950-020950-2.MED-14-1098 (IF .68)
  15. Mkhokheli Ncube, John Lazarus, **Sudesh Sivarasu** - Design of an Ureteropyeloscope, *Journal of Medical Devices: ASME transactions*, 2014, Vol.8(2) :020923-020923-2.MED-14-1053 (IF .68)
  16. Sharmila Nageswaran, Rekha V, **Sudesh Sivarasu** - Design evaluation of an automated bed for early detection and prevention of decubitus ulcers in non ambulatory patients, *Journal of Medical Devices: ASME transactions*, 2014, Vol.8 (2) :020925-020925-2.MED-14-1054 (IF .68)
  17. Chipu Chimhundu, Julian Smit, **Sudesh Sivarasu**, Tania Douglas - Inter-landmark Measurements from Lodox Statscan Images, *Journal of Medical Devices: ASME transactions*, 2014, Vol.8 (3) ;MED-14-1108 doi: 10.1115/1.4027102 (In Press) (IF .68)
  18. **Sudesh Sivarasu**, Pearlina Beulah, Lazar Mathew - Biomaterial Selection for Novel Low Weight Hip Implant Design, *Biomedical Engineering / Biomedizinische Technik*, 2014, Vol. 59. (s1); pp. 1126-1128 (IF 1.227)

19. **Sudesh Sivarasu**, Sam Prasanna, Lazar Mathew - 3D Reconstruction of Knee Joint from CT Images and Customized Meniscus Development, *Biomedical Engineering / Biomedizinische Technik*, 2014, Vol. 59. (s1); pp. 1132-1135 (IF 1.227)
20. Preethika Britto, Rekha Vijayakumar, **Sudesh Sivarasu**- Adaptive Control of Biomechanically Inspired Orthotic Exoskeleton in Paraplegic Rehabilitation, *Biomedical Engineering / Biomedizinische Technik*, 2014, Vol. 59. (s1); pp. 1034-1036 (IF 1.227)
21. Preethika Britto, **Sudesh Sivarasu**- Assistive Robotics for Hemiplegics: Smart Wheel Chairs in Rehabilitative Robotics, *Biomedical Engineering / Biomedizinische Technik*, 2014, Vol. 59. (s1); pp. 1037-1040 (IF 1.227)
22. SK Paul, **Sudesh Sivarasu**& L Mathew - Customized Foot Orthosis Development by 3D Reconstruction of the CT Images, *Engineering*, 2012, Vol.4(10). pp.692-695; doi:10.4236/eng.2012.410088
23. **Sudesh Sivarasu**, Pearline Beulah, Lazar Mathew - Novel Approach for Designing a Low Weight Hip Implant Used in Total Hip Arthroplasty Adopting Skeletal Design Techniques, *Artificial Organs*, 2011 Volume 35 (6), pp. 663–666 (IF 2.00)
24. R. Sudha, K.R.Prabhu, **Sudesh Sivarasu** - Development of Automated Robotic Arm to Handle Sampler and Reagent for Chemistry Analyzer, *International Journal of Applied Engineering Research*, 2011, Vol 6(12), pp. 1527-1530.
25. **Sudesh Sivarasu**, Pearline Beulah, Lazar Mathew - Light Weight Femoral Stem Optimization Based On Design And Materials, *Biomedical Engineering: Applications, Basis and Communications*, 2011, VOL.23(1) Pp 37-43(IF .43)
26. **Sudesh Sivarasu**, Sam Prasanna, Lazar Mathew - Reverse Engineering Vs Conceptual Design Principles in the Making of Artificial Knee Models; *Trends in Biomaterials & Artificial Organs*. 2011. 25(2), 60-62 (2011) (IF 0.675)
27. Debika Khanra, **Sudesh Sivarasu** - Below Elbow Upper Limb Prosthetic for Amputees and Paralyzed Patients; *International Journal of Computer Applications*, Vol. 16(5), pp. 35-39, 2011(IF 0.812)
28. K.E.Ch. Vidyasagar, T Phani , **Sudesh Sivarasu**, Design and Development of Wireless Intravenous Multidrug Delivery System; *International Journal of Technology and Engineering System*, 2011 Vol. 2(3). pp. 269-271
29. **Sudesh Sivarasu**, Lazar Mathew - Techno-economical Analysis of the Potential Rise of Demand for the Artificial High Flexion Knee in the Indian Orthopaedics Market; *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing* 2010. Vol.10(2) pp.115 – 121. (Nature Publishing Group)
30. Sam Prasanna, **Sudesh Sivarasu**, Lazar Mathew - Comparative Kinematic Analysis of the Range of Movement of a Normal Human Knee Joint, Standard Artificial Knee and Artificial High Flexion Knee; *Biomedical Engineering: Applications, Basis and Communications*, Vol.22(1). pp.41-45, 2010(IF .43)
31. **Sudesh Sivarasu**, Sam Prasanna, Lazar Mathew - Knee Kinematics Simulation and Comparative Flexion Angle Analysis of Reconstructed Knee Vs Standard Artificial Knee

- Vs High Flexion Artificial Knee; *International Journal of Modelling, Simulation, and Scientific Computing*, 2010. 1(4). pp 477 – 483.
32. **Sudesh Sivarasu**, Lazar Mathew - Biomechanical Evaluation of Degree of Freedom of Movements of a Novel High Flexion Knee for Its Suitability in Eastern Lifestyles; *Journal of Long Term Effects of Medical Implants*. 2009. 19 (4). Pp. 265-270
  33. **Sudesh Sivarasu**, Lazar Mathew - Artificial Knee Implant Design Parameters Affecting the Range of Motion Improvement after the Total Knee Arthroplasty; *Journal of Long Term Effects of Medical Implants*, 2009. 19(1). Pp 13 – 19
  34. Pearlina Beulah, **Sudesh Sivarasu** and Lazar Mathew- Design Optimization of Skeletal Hip Implant Cross-Sections using Finite Element Analysis , *Journal of Long Term Effects of Medical Implants*,(2009) Volume 19 (4), pp:271-278
  35. **Sudesh Sivarasu**, Lazar Mathew - Kinematic Analysis and Three-Dimensional Finite Element Analysis of a Mobile Bearing Artificial High Flexion Knee; *Biomedical Engineering: Applications, Basis and Communications*,2009. 21 (4). pp: 279-286 (IF .43)
  36. **Sudesh Sivarasu**, Lazar Mathew - Techniques in Development of a Low Weight Medical Implants and its strength validation using Finite Element Methods; *Journal of Long Term Effects of Medical Implants*. 2009. 19(1). pp 53 - 58. 2009.
  37. **Sudesh Sivarasu**, Lazar Mathew - Finite Element Analysis of a Novel High Flexion Knee (Ti - UHMWPE) used in Total Knee Arthroplasty; *The Int. Journal of Bioengineering*. Vol 4 (1). 2009
  38. **Sudesh Sivarasu**, Lazar Mathew - Structural Responses of a Novel High Flexion Knee (SS316 - UHMWPE) used in Total Knee Arthroplasty using Finite Element Analysis; *Biophysical Reviews and Letters*, World Scientific Publishing. 2009. Vol.4 (3) pp. 289-298
  39. **Sudesh Sivarasu**, Lazar Mathew - Finite Element Based Design Optimization of a Novel High Flexion Knee used in Total Knee Arthroplasty; *Applied Bionics & Biomechanics*, Taylor & Francis. 2008. 5(2) pp. 77 – 87. (IF .45)
  40. **Sudesh Sivarasu**, Lazar Mathew - 3D CAD Conceptual Design of an Artificial Knee; *Journal of Long Term Effects of Medical Implants*. 2007. 17(4). pp 313 – 320.

### **Papers Published in Conferences [36]**

1. Beukes, G., Patnaik, S., & **Sivarasu, S.** (2017). Development of A Stress Radiography Device Towards Multi-Ligament Laxity Measurements. *Bone Joint J*, 99(SUPP 2), 109-109.
2. Salhi, Asma, Valerie Burdin, Tinashe Mutsvangwa, **Sudesh Sivarasu**, Sylvain Brochard, and Bhushan Borotikar. (2017)- Subject-specific shoulder muscle attachment region prediction using statistical shape models: A validity study. In *Engineering in Medicine and Biology Society (EMBC), 2017 39th Annual International Conference of the IEEE*, pp. 1640-1643. IEEE, 2017.
3. Inyang, Adijat O., Jean-Rassaire Fouefack, **Sudesh Sivarasu**, Stephen Roche, Bhushan Borotikar, Valérie Burdin, and Tinashe Mutsvangwa.(2017) - Assessment of 3D

morphological characteristics of the shoulder bones using statistical shape modeling: Prospective application to handedness. In Engineering in Medicine and Biology Society (EMBC), 2017 39th Annual International Conference of the IEEE, pp. 1629-1632. IEEE, 2017.

4. *Dey, R., Inyang, W., Mutsvangwa, T., Charilaou, J., Roche, S., & Sivarasu, S.* (2017). A Comparative Shoulder Morphometric Study Towards A Novel Metric: "Peak Points". *Bone Joint J*, 99(SUPP 1), 24-24.
5. *Inyang, A. O., Dey, R., Mutsvangwa, T., Roche, S., & Sivarasu, S.* (2017). Morphometric Measurements of the South African Proximal Humerus. *Bone Joint J*, 99(SUPP 1), 23-23.
6. *Glenday, J., Sivarasu, S., Gulotta, L., Roche, R., Kontaxis, A.* (2017). The Effect of Humeral Tray Placement on the Reverse Shoulder Arthroplasty Impingement. Orthopaedic Research Society (ORS) Annual Meeting, March 19<sup>th</sup> – 22<sup>nd</sup>, 2017. San Diego, USA. Paper no. 0275.
7. *Liedtke, Helen, A. T. McBride, S. Sivarasu, and S. Roche.* - Computational simulation of bone remodelling post reverse total shoulder arthroplasty. *arXiv preprint arXiv:1705.08324* (2017).
8. *Inyang, A., Fouefack J.R., Sivarasu, S., Roche, S., Borotikar, B., Burdin, V., Mutsvangwe, T.* (2017). Assessment of 3D Morphological Characteristics of the Shoulder Bones Using Statistical Shape Modeling: An Application to Handedness. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) Milano, Italy, July 11<sup>th</sup> -15<sup>th</sup>, 2017
9. *Salhi, A., Burdin, V., Mutsvangwe, T., Sivarasu, S., Brochard, S., Borotikar, B.* (2017). Subject-Specific Shoulder Muscle Attachment Region Prediction Using Statistical Shape Models: A Validity Study. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) Milano, Italy, July 11<sup>th</sup> -15<sup>th</sup>, 2017
10. *Megan Findlay, Jeanine Heckmann, Sudesh Sivarasu* - A Modular and Adjustable Ptosis Crutch as a Non-Surgical, Low Cost Solution for Elevating the Upper Eyelid in Myasthenia Gravis Patients- Appropriate Healthcare Technologies for Low Resource Settings - AHT2016, MEIBioEng2016, Oxford, UK, Sep, 2016 (Publication Awaited)
11. *Giancarlo Beukes, Sarthak Patnaik, Sudesh Sivarasu* - Development of a Low Cost Stress Radiography Device Towards Multi-ligament Laxity Measurements - Appropriate Healthcare Technologies for Low Resource Settings - AHT2016, MEIBioEng2016, Oxford, UK, Sep, 2016 (Publication Awaited)
12. *Roopam Dey, Sarthak Patnaik, Gokul Nair, Sarthak Patnaik, Sudesh Sivarasu* - Testing the performance of a novel low cost 3D-printed surgical drill-guiding device (Pat-Rig) - Appropriate Healthcare Technologies for Low Resource Settings - AHT2016, MEIBioEng2016, Oxford, UK, Sep, 2016 (Publication Awaited)
13. *Sudesh Sivarasu* - Affordable Medical Devices Design and Development in South Africa – 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) Milano, Italy, August 25th-29th, 2015

14. *Sharmila Nageswaran, Rekha Vijayakumar, **Sudesh Sivarasu*** - Design of Mechanical Interface to Re-distribute Excess Pressure to Prevent the Formation of Decubitus Ulcers in Bed Ridden Patients – 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) Milano, Italy, August 25th-29th, PP 1021- 1024, 2015
15. *Sathish Kumar Paul, Rekha Vijayakumar, **Sudesh Sivarasu*** - Palmar pressure thresholds in Grasp and Pinch functions – 7th World Congress on Bioengineering, conducted by WACBE, Singapore 6 to 8th, July 2015, Vol. 52, Page. 107-109
16. *Sarthak Patnaik, **Sudesh Sivarasu*** - Patellofixator – Design Specifications of a Device Assisting Medial Patello Femoral Ligament [MPFL] Reconstruction – 7th World Congress on Bioengineering, conducted by WACBE, Singapore 6 to 8th, July 2015, Page. 96-99
17. *Preethika Britto, Rekha Vijayakumar, **Sudesh Sivarasu*** - Design Evaluation of REMAP Exoskeleton – 7th World Congress on Bioengineering, conducted by WACBE, Singapore 6 to 8th, July 2015, Vol. 52, Page. 110-112
18. *Paul, Sathish K., and **Sudesh Sivarasu*** -Simplified finite model based evaluation of tissue stress distribution on anesthetic feet of Leprosy patients for 3 dimensional orthosis fabrication, *Journal of Foot and Ankle Research* 7.Suppl 1 (2014): A91. (IF1.46)
19. ***Sudesh Sivarasu**, Sarthak Patnaik* - Design and prototype development of a novel low cost stress radiographic device - Laxmeter (An Indo- Africa Invention) Appropriate Healthcare Technologies for Developing Countries – AHT2014. The 7th International Conference – World Health and Wellbeing, 17 – 18 Sep, 2014. London, UK Paper no. 0036 DOI: 10.1049/cp.2014.0776
20. *Sathish Kumar Paul, Rekha Vijayakumar, **Sudesh Sivarasu*** - Tactile sensing fabric glove to predict peak palmar pressure and prevent early impairments in leprosy affected patients - 2 year follow up study. - Appropriate Healthcare Technologies for Developing Countries – AHT2014. The 7th International Conference – World Health and Wellbeing, 17 – 18 Sep, 2014. London, UK Paper no. 0034 DOI: 10.1049/cp.2014.0788
21. *Sathish Kumar Paul, Rekha Vijayakumar, **Sudesh Sivarasu*** - Moulded Insole Fabrication for Foot Deformities using Computer Tomographic Images - Appropriate Healthcare Technologies for Developing Countries – AHT2014. The 7th International Conference – World Health and Wellbeing, 17 – 18 Sep, 2014. London, UK Paper no. 009 DOI: 10.1049/cp.2014.0787
22. *Sathish Kumar Paul, David Prakash Kumar, **Sudesh Sivarasu*** - Technical Specifications for Rehabilitation Devices Prescribed for Leprosy Affected – A Review - Appropriate Healthcare Technologies for Developing Countries – AHT2014. The 7th International Conference – World Health and Wellbeing, 17 – 18 Sep, 2014. London, UK Paper no. 012 DOI: 10.1049/cp.2014.0775
23. ***Sudesh Sivarasu**, Sam Prasanna, Lazar Mathew* – Finite Element Method Oriented Failure Analysis Medical Implant: Artificial Knee – ASME Frontiers in Medical Devices: Application of Computer Modelling and Simulation, September 11-13, 2013, Washington D.C, USA. V001T10A038

24. *Preethika Britto, Rekha V & Sudesh Sivarasu* - Conceptual Design of a Paraplegic Walker - Appropriate Healthcare Technologies for Developing Countries – AHT2012. The 7th International Conference – World Health and Wellbeing, 18 – 19 Sep, 2012. London, UK Paper no. 0011
25. *Sathish Kumar Paul, Rekha V & Sudesh Sivarasu* - Tactile Sensing Fabrics for Detecting Impairments in Leprosy Patients. - Appropriate Healthcare Technologies for Developing Countries – AHT2012. The 7th International Conference – World Health and Wellbeing, 18 – 19 Sep, 2012. London, UK Paper no. 0023
26. *Sudesh Sivarasu, Pearline Beulah, Lazar Mathew* – Optimization of Skeletal Hip Implant Cross-Sections –National Conference on Computational Instrumentation-2010, Apr 19 - 20, 2010. NCCI Proceedings, Pg. 44-50
27. *Sudesh Sivarasu, Preethika Britto, Lazar Mathew* – Automation of wheel chair using ultrasonics and body kinematics –National Conference on Computational Instrumentation-2010, Apr 19 -20, 2010. NCCI Proceedings, Pg. 37 - 43
28. *Sudesh Sivarasu, Pearline Beulah, Lazar Mathew* – Medical Device Design – Impact of Software Technology Usage –National Conference on Biotechnology for Human Development, VIT University, India 27 – 28 Nov, 2009. Pg.63-65
29. *Sam Prasanna, Sudesh Sivarasu, Lazar Mathew* – Looking at Knee – A Kinematic Perspective, International Conference on Biomedical Instrumentation and Healthcare Engineering (ICOBIAHC '09). Pp 157 -162
30. *Sudesh Sivarasu, Lazar Mathew.* (2008) Artificial high Flexion Knee customized for Eastern Lifestyles. 13th International Conference on Biomedical Engineering, Singapore, 3-6 December, 2008. pp 1497-1499.
31. *Sudesh Sivarasu, Lazar Mathew.* (2008) Modelling an artificial knee for customized needs of Indian population. International Conference on Biotechnology-2008, VITU, Pp.132-133.
32. *Sudesh Sivarasu, Lazar Mathew* (2007) “Design of an artificial high flexion knee”, Life Science Systems and Applications Workshop, 2007. LISA 2007. IEEE/NIH, Publication Date: 8-9 Nov. 2007, Pp: 112-115.
33. *Sudesh Sivarasu, Lazar Mathew* (2006) “Design aspects in an Artificial Knee for Indian conditions” Biomedical Devices-2006, BMD-06, at CG&CRI, Kolkatta. Pg 132 -135
34. *Sudesh Sivarasu, Lazar Mathew*,(2006) “MEMS based drug delivery systems for Biomedical Application” proceedings of NCICSA – 2006, SRM University, India. Page 75 - 78
35. *Sudesh Sivarasu, Lazar Mathew,* (2006) “Review Article: Total Knee Arthroplasty and Artificial Knee” proceedings of NCICSA – 2006, SRM University, India. Page 78 -81
36. *Sudesh Sivarasu, Lazar Mathew,* (2006) “MEMS Implants” Genesis – 06, National Level Technical symposium in Erode. India Pg. 85 -87

**Personal Profile**

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 7, Punters Way, Kenilworth  
 Cape Town, South Africa – 7708  
 Nationality : Indian : Z2772981 [ Indian Passport]  
 Race : Indian

**Teaching Experience:**  
**Courses Taught:**

Level	Course	Course Code	Institute
MSc.Engg. / M.Tech	1. Medical Device Design 2. Biomechanics of Musculo-Skeletal Systems 3. Advanced Biomechanics 4. Rehabilitation Engineering 5. Health Care Management	HUB6009F / HUB6010S HUB4007F BME518 BME511 BME520	1. University of Cape Town 2. University of Cape Town 3. VIT University 4. VIT University 5. VIT University
M.Med Orthopedics	1. Orthopedic Biomechanics	NA	1. Groote-Schuur Hospital / University of Cape Town
MS Global Health	1. Global Health and Technologies	MSGH458	1. Northwestern University, Chicago, USA
B.Eng/ Hons	1. Basic Biomechanics 2. Bio-Transducers & Electrodes (Theory + Lab)	BME210 BME204	1. VIT University 2. VIT University

B. Physio	1. Fundamentals of Biomechanics 1A	HUB1023S	1. University of Cape Town
MBChB	2. Fundamentals of Biomechanics 1B	HUB1024F	
	3. IP Physics	HSE1012S	
	4. IP Physics	HSE1013F	

### **Innovative Teaching / Research Methods Adopted:**

1. HUB4007F – has an integrated design module where the student will have to develop a biomechanical model / device
2. The success of the design module in HUB4007F gave way to 1 Intellectual Property generation (1 Patent) and a few publications. This module was later converted into a separate course on Biomedical Engineering Design (HUB6006W), where the student gets 10 month training in Medical devices design
3. New courses Introduced in UCT – Biomedical Engineering Design (HUB6006W),
4. BME Design course is most desired course in MSc BME programme in UCT. Through this course 2 Patents and 4 peer reviewed publications were generated.
5. New Course Introduced in VITU – Biomedical Systems Design, Advanced Biomechanics, BME Design Project, Healthcare Management and Topics in BME (Seminar Series)
6. Developed course curriculum for B.Tech and M.Tech programme in Biomedical Engineering at VIT University; B.Tech curriculum developed by me remains the only undergraduate Biomedical Engineering programme in Asia to get ABET accreditation
7. Initiated clinical collaborative platform between University of Cape Town and Groote Schuur hospital; through which multiple clinical collaborations have been initiated and number of clinically relevant projects have been successfully completed.
8. Introduced Novel Frugal Biodesign™ into Medical Device Design and subsequently into a course <http://www.rci.uct.ac.za/news/innovations-uct%E2%80%99s-medical-device-design-course>