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Curriculum Vitae

SORIN SIEGLER, Ph.D.

Professor

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EDUCATION

- **Ph.D. in Biomechanics**, Drexel University, School of Biomedical Engineering, Philadelphia, Pennsylvania, USA, 1982, Dissertation “Biomechanics of Flexion and Extension of the Human Ankle Joint”.
- **M.Sc. in Biomechanics**, Texas A&M University, Department of Industrial Engineering, College Station, TX, USA, 1979. Dissertation “Simulation of Human Gait with the Aid of A Simple Mechanical Model”.
- **B.Sc. in Aeronautical Engineering**, Technion, Israel Institute of Technology, Department of Aeronautical Engineering, Haifa, Israel, 1977.

PROFESSIONAL EXPERIENCE

At Drexel University

- **Professor**, Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, Pennsylvania, *September 2000 – Present*
- **Associate Professor**, Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, Pennsylvania, *September 1989 – August 2000.*
- **Assistant Professor**, Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, Pennsylvania, *September 1982 - September 1989*

At Other Academic Institutions

- **Visiting Professor on Sabbatical**, Rizzoli Orthopaedic Institute, Bologna, Italy, *August 2014 – July 2015.*
- **Visiting Professor on Sabbatical**, Department of Radiology, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, *July 2005 – July 2006*
- **Adjunct Associate Professor**, Department of Orthopaedic Surgery & Rehabilitation, Hahnemann University Medical School, Philadelphia, Pennsylvania, *January 1992 - December 1994*

- **Visiting Associate Professor on Sabbatical**, Department of Kinesiology and Biomechanics, University of Calgary, Calgary, Canada, *June 1991- January 1992.*

HONORS AND AWARDS

- Recipient of Drexel's **Patent Recognition Award** for U.S. Patent "Apparatus and Method for Determining Load-displacement and Flexibility Characteristics of a Joint.", issued July/20/1993, February 1994
- Recipient of Drexel's **Patent Recognition Award** with S. Kalidindi and Abusafieh on a Drexel Patent entitled: "Swelling-type Co-polymeric Material for Self-Fixation Anchorage to Bone", March 1999
- Recipient of the **Best Poster Award**: S. Pirani, S.Sielger, R.Brand, W. Morrison, D. Hodges, J.K. Udupa "Correction of Tarsal Deformities and Displacements in Congenital Clubfoot with Ponseti Treatment: When & How Does it Occur - A 3D MRI Analysis.", Paediatric Orthopaedic Society of North America, Orlando, Florida, USA, May 2005.
- Recipient of the **Best Poster Award**: Carl W Imhauser, Sorin Siegler Jayaram K Udupa, Jason R Toy, "A Relationship Between Hindfoot Morphology and Mechanical Behavior", 54th Annual Meeting of the Orthopaedic Research Society, *ORS #: 1580*, San Francisco, CA, February 2008
- Recipient of the **Clinical Biomechanics Award**: Siegler, S., Toy, Jason, Pedowitz, David, "New Observations on the Morphology of The Talar Dome and Its Relationship to Ankle Kinematics.", 2013 International Society of Biomechanics Congress, Natal, Brazil, August 2013.
- Recipient of the **2016 Joint Winner Research Award**, Belvedere, C., Siegler, S., Ensini, A., Caravaggi, P., Durante, S., Namani, R., Toy, J., Leardini, A., "Effect of Variations in Ankle Surface Morphology on Joint Kinematics and Load-Transfer Characteristics", Presented at the Foot International, FI-2016 (i-FAB, EFAS, DAF), Berlin, Germany, June 2016.
- Recipient of the **2016 Best Technical Podium Presentation**: Belvedere C., Siegler S., Ensini A., Fortunato A., Caravaggi P., d'Amato M., Durante S., Leardini A., "A new computer-assisted procedure including medical Imaging, 3D modeling and printing for personalized joint replacement: the case of total-ankle.", 16th Annual Meeting, International Society of Computer Assisted Orthopaedic Surgery, Osaka, Japan, June 2016.
- Recipient of the **2018 Best Podium Presentation Award**: Sorin Siegler, Maui Jepsen, Francois Lintz, "Surface-to-surface interaction at the joints of the ankle complex and foot in varus and valgus deformities.", Presented at the International Foot and Ankle Biomechanics Conference, i-FAB 2018, New York, New York, USA, April 2018.

NATIONAL AND INTERNATIONAL COMMITTEES AND PANELS

1993 – 2000	Member, Design Committee of the Biomechanical Engineering Section, American Society of Mechanical Engineers.
1994 – 2004	Chairman, Standardization Committee on the ankle, International Society of Biomechanics.
2007- 2012	Chairman, Standards and Resources Committee of the International Foot and Ankle Biomechanics Society

EDITORIAL BOARD MEMBERSHIP

2002 – Present	Associate Editor, Foot & Ankle International
2008 – Present	Member of the Editorial Board, Journal of Forensic Biomechanics
2010 – Present	Member of the Editorial Board, World Journal of Orthopaedics.

MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

2008 – Present	Member of the International Foot and Ankle Biomechanics Soc.
1985 – Present	Member of the American Society of Mechanical Engineers
1982 – Present	Member of the American Society of Biomechanics.
1982 – Present	Member of the International Society of Biomechanics.

PUBLICATIONS

Books and book chapters

Siegler, S., and Wen, L., Chapter 10: “Inverse Dynamics in Human Locomotion”, Book Title: “Three-Dimensional Analysis of Human Locomotion.”, Edited by: Allard, P., Cappozzo, A., Lundberg, A., and Vaughan, C., Published by John Wiley & Sons Ltd., 1998.

Archived Peer-Reviewed Journals

1. Siegler, S. Seliktar, R. and Hyman, W., "Simulation of Human Gait with the Aid of a Simple Mechanical Model.", **Journal of Biomechanics**, Vol. 15, No. 6, pp. 415-425, 1982.
2. Siegler, S., Moskowitz, G.D. and Freedman, W., " Passive and Active Components of the Internal Moment Developed about the Ankle Joint During Human Ambulation.", **Journal of Biomechanics**, Vol. 17, No.9, pp. 647-652, 1984.
3. Siegler, S., Hillstrom, H. J., Freedman, W. and Moskowitz, G. D., "The Effect of Myoelectric Signal Processing on the Relationship Between Muscle Force and Processed EMG.", **American Journal of Physical Medicine**, Vol. 64, No. 3, pp. 130-149, 1985.
4. Siegler S, Hillstrom HJ, Freedman W, Moskowitz G., “The effect of myoelectric signal processing on the relationship between muscle force and processed EMG. **Electromyogr Clin Neurophysiol.** 25(7-8):499-512, 1985.
5. Siegler, S., Block, J. and Schneck, C., " The Mechanical Characteristics of the Collateral Ligaments of the Human Ankle Joint", **Foot and Ankle Journal of the American Orthopedic Foot and Ankle Society**, Vol. 8, No. 5, pp. 234-243, April 1988.
6. Siegler, S., Chen, J. and Schneck, C.D., "The three dimensional kinematics and flexibility characteristics of the human ankle and subtalar joints. Part 1: Kinematics.", **ASME**

Transactions, Journal of Biomechanical Engineering, Vol. 110, No.4 pp. 364-374, Nov. 1988

7. Chen, J., Siegler, S. and Schneck, C.D., " The three dimensional kinematics and flexibility characteristics of the human ankle and subtalar joints. Part 2: flexibility characteristics.", **ASME Transactions, Journal of Biomechanical Engineering**, Vol. 110, No. 4, pp. 374-386, Nov. 1988.
8. Siegler, S., Chen, J. and, Schneck, C.D., "The effect of damage to the lateral collateral ligament on the mechanical characteristics of the ankle joint: An in-vitro study.", **ASME Transactions, Journal of Biomechanical Engineering**, Vol.112, pp. 129-137, May 1990.
9. Siegler, S., Hayes, R., Fielding, A., Kim, H., Nicolella, D., and Slawek, S., "A Technique to Investigate the Three Dimensional Kinesiology of the Human Temporomandibular Joint.", **Journal of Prosthetic Dentistry**, Vol. 65, No. 6, pp. 833-839, June 1991.
10. Hillstrom, H., Perlberg, G., Siegler, S., Sanner, W., Hice, G., Downey, M., Stientra, J., Acello, A., Neary, M., Kugler, F., "Objective identification of ankle equinus deformity and resulting contracture.", **Journal of the Podiatric Medical Association**, Vol. 81, No. 10, pp. 519-524, October 1991.
11. Maurer, B.T., Hillstrom, H.J., Siegler, S., Kugle, F., Hice, G., Malay, D.S., Downey, M., Stienstra, J., "Objective Diagnosis of Equinus Deformity Based on Walking Performance Prior to and Following a Tibial Nerve Block.", **Journal of the Podiatric Medical Association**, Vol. 84, No. 2, pp. 57-65, February 1994.
12. Siegler, S., Wang, D., Plasha, E., and Berman, A.T., "Technique for in-vivo measurement of the three dimensional kinematics and laxity characteristics of the ankle joint complex.", **Journal of Orthopaedic Research**, Vol. 12, No.3, pp. 419-429, May 1994.
13. Maurer, B.T., Siegler, S., Hillstrom, H.J., Selby-Silverstein, L., and Farrett, W.D., "Quantitative Identification of Ankle Equinus Deformity with Applications for Treatment Assessment.", **Journal of Gait & Posture**, Vol. 3, No. 1, pp. 19-27, February 1995.
14. Esola, M.A., McClure, P.W., Fitzgerald, G.K., and Siegler, S., "Analysis of Lumbar and Hip Motion During Forward Bending in Subjects with and Without a History of Low Back Pain.", **Spine**, Vol. 21, No. 1, pp. 71-78, January 1996.
15. Allard, P., Kirtley, C., Rosenbaum, D., Siegler, S., Whittle, M., "Proposed ISB standards on the ankle complex" **International Society of Biomechanics Newsletter**, October 1995.
16. Siegler, S., Lapointe, S.J., Nobilini, R., and Berman, A.T., "A Six-Degrees-of-Freedom Instrumented Linkage for Measuring the Flexibility Characteristics of the Ankle Joint Complex", **J. Biomechanics**, Vol. 29, No. 7, pp. 943-947, 1996.
17. P. McClure, M. Esola, R. Scherier, S. Siegler, "Kinematic Analysis of Lumbar and Hip Motion While Rising From a Forward Flexed Position in Subjects with and Without a History of Low Back Pain.", **Spine**, Vol. 22, No. 5, March 1997.
18. Liu, W., Siegler, S., Hillstrom, H., Whitney, K., "Three-Dimensional Six-Degrees-of-freedom kinematics of the human hindfoot during the stance phase of level walking.", **Human Movement Science Journal**, Vol. 16, pp. 283-298, 1997.

19. Abusafieh, A., Kalidindi, S., Vemuganti, A., Siegler, S., "Development of Self-Anchoring Bone Implants: 1. Processing and Material Characterization", **J. Biomedical Materials Research**, Vol. 38, pp. 314 -327, 1997
20. Vemuganti, A., Siegler, S., Abusafieh, A. And Kalidindi, S., "Development of Self-Anchoring Bone Implants: 2. Bone/Implant Interface Characteristics in-vitro", **J. Biomedical Materials Research**, Vol. 38, pp. 328-336, 1997
21. Lapointe, S., Siegler, S., Hillstrom, H., Nobilini, R., Mlodzienski, B., and Techner, L., "Changes in the Flexibility Characteristics of the Ankle Complex due to Damage to the Lateral Collateral Ligaments: An In Vitro and In Vivo Study", **Journal of Orthopaedic Research**, Vol 15, No. 3, pp. 331-341, 1997
22. S. Siegler, W. Liu, Sennett, B., Nobilini, R.J., and Dunbar, D., "The Three-Dimensional Passive Support Characteristics of Ankle Braces.", **Journal of Orthopaedics and Sports Physical Therapy**, Vol. 26, No. 6, Dec. 1997.
23. McClure, P; Siegler, S; Nobilini, R, "Three-dimensional flexibility characteristics of the human cervical spine in vivo.", **Spine**, 23:2, 216-223, Jan. 1998.
24. Guiltiei, G., Siegler, S., Hume, E., and Kalidindi, S., "Biological and Mechanical Characteristics of the Interface Between a New Swelling Anchor and Bone.", **Journal of Orthopaedic Research**, Vol. 18, No. 3, August 2000.
25. Liu W, Siegler S, and Techner L: Using an arthrometer to determine ankle mechanical instability in acute and chronically sprained ankles. **Clinical Biomechanics**, 16(3):237-44, 2001.
26. Nien, Y., Kalidindi, S., and Siegler, S., "Fixation Strength of Swellable Bone Anchors in Low Density Polyurethane Foam.", 58(2), 137-146, **Journal of Biomedical Materials Research**, 2001
27. Harris, B. M., Hillibrand, A. S., Nien, Y., Nachwalter, R., Vaccaro, A.R., Albert, T.J., and Siegler, S., "A Comparison of Three Systems for Unicortical Fixation in the Lateral Mass of the Cervical Spine, Vol. 26, No. 22, 2427-2431, **Spine**, 2001.
28. Liu, W., S. Siegler and L. Techner (2001). "Quantitative measurement of ankle passive flexibility using an arthrometer on sprained ankles." **Journal of Clinical Biomechanics** (Bristol, Avon) 16(3):17 237-244.
29. Tack, D., Siegler, S., and Kam, M., "An Automated Neck Flexibility Tester.", **IEEE Journal on Biomedical Engineering**, Vol. 49, Number 4, pp 384-392, April 2002.
30. Wu, G., Siegler, S., Allard, P., Kirtley, C., Leardini, A., Rosenbaum, D., Whittle, M., D'Lima, D.D., Cristofolini, L., Wittle, H., Schmid, O., Stokes, I., "ISB Recommendation on definitions of joint coordinate system of various joints for the reporting of human joint motion – part I: ankle, hip, and spine., **J. of Biomechanics**, vol. 35, pp. 543-548, 2002.
31. Imhauser, C.W., Abidi, N.A., Frankel, D.Z., Gavin, C., Siegler, S., "Biomechanical Evaluation of the Efficacy of External Stabilizers in the Conservative Treatment of Acquired Flatfoot Deformity.", **Foot and Ankle International**, vol. 23, No. 8, pp. 727-737, August 2002.

32. P.K.Saha, J.K.Udupa, A.X.Falcao, B.E.Hirsch, S.Siegler, "Iso-shaping rigid bodies for estimating their motion from image sequences", **IEEE Transactions on Medical Imaging**, vol. 23 (1), 63-72, 2004.
33. Basil M. Harris, MD PhD; Alan S. Hilibrand, MD; Paul E. Savas, MD; Anthony Pellegrino, BS; Alexander R. Vaccaro, MD; Todd J. Albert, MD; Sorin Siegler, PhD, "Transforaminal Lumbar Interbody Fusion: The Effect Of Various Instrumentation Techniques On The Flexibility Of The Lumbar Spine.", **Spine**. 29(4):E65-E70, February 15, 2004
34. Imhauser, C.W., Siegler, S., Abidi, N.A., Frankel, D., Gavin, K., "The effect of posterior tibialis tendon dysfunction on the plantar pressure characteristics and the kinematics of the arch and the hindfoot.", **Journal of Clinical Biomechanics**, Vol. 19/2 pp 161-169, 2004.
35. Siegler, S., Udupa, JK, Ringleb, SI, Imhauser, CW, Hirsch, BE, Odhner, D, Okereke, E, "Mechanics of the ankle and subtalar joints through a three-dimensional quasi-static stress MRI technique.", **Journal of Biomechanics**, Vol. 38/3 pp 567-578, 2005.
36. Ringleb, SI, Udupa, JK, Siegler, S, Imhauser, CW, Hirsch, BE, Liu, J, Odhner, D, Okereke, E, Roach, N, "The Effect of Ankle Ligament Damage and Surgical Reconstructions on the Mechanics of the Ankle and Subtalar Joints Revealed by Three-Dimensional Stress MRI.", **Journal of Orthopaedic Research**, Vol. 23, pp. 743-749, 2005
37. Liu, J., Udupa, J.K., Saha, P.K., Odhner, D., Hirsch, B.H., Siegler, S., Simon, S., Winkelstein, B.A., "Rigid, Model-Based 3D Segmentation of the Bones of Joints in MR and CT images.", **SPIE**, April 2006
38. Hilibrand, A.S., Balasubramanian, K., Eichebaum, M., Thinnes, J.H., Daffner, S, Berta, S., Albert, T.J., Vaccaro, A.R., Siegler, S., "The Effect of Anterior Cervical Fusion on Neck Motion.", **Spine**, Vol. 31, No. 15, pp. 1688-1692, 2006
39. Brand, RA, MD, Siegler, S., PhD, Pirani, S, MD, Morrison, W., MD, Udupa, J., PhD, "Cartilage Anlagen Adapt in Response to Static Deformation", **Journal of Medical Hypotheses**, Vol. 66, pp. 653-659, February 2006.
40. Clabbers KM, Kelly JD, Bader D, Eager M, Imhauser C, Siegler S, Moyer RA, "Effect of posterior capsule tightness on glenohumeral translation in the late-cocking phase of pitching. **J Sport Rehabil**;16(1):41-9. Feb. 2007
41. Mahmoodian Roza, Siegler, Sorin, "An MRI based study of tarsal development during manipulation and casting therapy of infant clubfoot.", **ASME paper IMECE2007-42573**, 2007 ASME International Mechanical Engineering Congress and Exposition, November 11-15, 2007, Seattle, Washington, USA
42. Imhauser CW, Siegler S, Udupa JK, Toy JR, "Subject-specific models of the hindfoot reveal a relationship between morphology and passive mechanical properties"., **Journal of Biomechanics** Vol 41/6 pp 1341-1349, March 2008.
43. Siegler, S. "Advances in Image-Based Biomechanics of the Human Ankle", Keynote Presentation from 1st International Foot and Ankle Biomechanics Congress, Bologna, Italy, Sept 4-6, 2008, published in **Journal of Foot and Ankle Research 2008**, 1(Suppl 1):K5, Open Access, September 26, 2008

44. Liu, J., Udupa, J.K., Saha, P.K., Odhoner, D., Hirsch, B.H., Siegler, S., Simon, S., Winkelstein, B.A., "Rigid, Model-Based 3D Segmentation of the Bones of Joints in MR and CT images for motion analysis.", Volume 35, Number 8, pp 3637-3649, **Medical Physics**, August, 2008.
45. Roza Mahmoodian MS, Jeremi Leasure BS, Hemanth Gadikota MS, Franco Capaldi PhD, Sorin Siegler PhD, "Mechanical Properties of Human Fetal Talus", Volume 467, No. 1, pp. 1186-1194, Clubfoot: Treatment and etiology, **Clinical Orthopaedic and Related Research**, April 2009.
46. Ciccotti, M., Siegler, S., Kuri, J., Murphy, D., Thinner, J., "A Comparison of the Biomechanical Profile of the Intact Ulnar Collateral Ligament with the Modified Jobe and the Docking Reconstructed Elbow – An In-Vitro Study", Volume 37, pp 974-981, **American Journal of Sports Medicine**, March 2009.
47. Marchetto, P., Siegler, S., Gadikota, H., Murphy Daniel "Passive Support Characteristics of Ankle Athletic Tape Evaluated with a Six-Degrees-of-Freedom Instrumented Linkage.", Submitted, **Journal of Orthopaedics and Sports Physical Therapy**, 2011.
48. R. Mahmoodian , J. Leasure , P. Philip , N. Pleshko , F. Capaldi , S. Siegler, "Changes in mechanics and composition of human talar cartilage anlagen during fetal development.", **Osteoarthritis and Cartilage**, 19 (2011), 1199-1209.
49. Fassbind, ES, Rohr, ES, Hu, Y., Haynor, D.R., Siegler, S., Sangeorzan, BJ, Ledoux, WR, "Evaluating foot kinematics using magnetic resonance imaging: from maximum plantar flexion, inversion, and internal rotation to maximum dorsiflexion, eversion, and external rotation", **ASME Transactions, Journal of Biomechanical Engineering**, Volume 133, No. 10, pp 104502, 2011.
50. Siegler, S., Marchetto, P., Murphy, DJ., Gadikota, H., A Composite Athletic Tape with Hyper-Elastic Material Properties Improves and Maintains Ankle Support During Exercise.", **Journal of Orthopaedics and Sports Physical Therapy**, Volume 41, Number 12, pp. 961-968, December 2011.
51. Jaumard NV, Udupa J, Siegler S, Schuster JM, Hilibrand AS, Hirsch BE, Borthakur A, Winkelstein BA. Three-dimensional kinematic stress magnetic resonance image analysis shows promise for detecting altered anatomical relationships of tissues in the cervical spine associated with painful radiculopathy. **Medical Hypotheses**, Volume 81, pp. 738-744, 2013.
52. Siegler, S., Toy, J., Damani, S., Pedowitz, D., "The Clinical Biomechanics Award 2013 – Presented by the International Society of Biomechanics: New Observations on the Morphology of the Talar Dome and its Relationship to Ankle Kinematics", **Journal of Clinical Biomechanics**, Volume 29, Number 1, pp 1-6, 2014
53. Steven B Cohen MD, Daniel P Woods MD, Sorin Siegler PhD, Ramya Namani MS, Christopher C Dodson MD, Michael G Ciccotti MD, "Biomechanical comparison of graft fixation at 30° and 90° of elbow flexion for ulnar collateral ligament reconstruction using the Docking technique.", **Journal of Shoulder and Elbow Surgery**, Volume 24, pp 265-272, 2015.

54. Sorin Siegler, Paolo Caravaggi, James Tangorra, Mary Milone, Ramya Namani, Paul A. Marchetto., “The envelope of motion of the cervical spine and its influence on the maximum torque generating capability of the neck muscles”., **Journal of Biomechanics**, Volume 48, Issue 13, pp 3659-3664, 2015.
55. E. Liverani, A. Fortunato, A. Leardini, C. Belvedere, S. Siegler, L. Ceschini ,A. Ascari, “Fabrication of Co–Cr–Mo endoprosthesis ankle devices by means of Selective Laser Melting (SLM)”, **Materials and Design**, Vol. 106 pp. 60–68, 2016.
56. Claudio Belvedere^a, Sorin Siegler^b, Andrea Ensini, Jason Toy, Paolo Caravaggi, Ramya Namani Giulia Giannini, Stefano Durante, Alberto Leardini, “Experimental evaluation of a new morphological approximation of the articular surfaces of the ankle joint”, **Journal of Biomechanics**, Volume 53, pp. 97-104, 2017.
57. Christopher M Jones MD, Eric M Padegimas MD Nicole Weikert MS, Samuel Greulich BS, Asif M Ilyas MD, and Sorin Siegler PhD, “Headless Screw Fixation of Metacarpal Neck Fractures: a Biomechanical Comparative Analysis.”, **Journal of Hand Surgery**, Submitted for Publication, January 2017.
58. Tobias Konow, Claudio Belvedere, Andrea Ensini, Rewati Kulkarni, Alberto Leardini, Sorin Siegler, “Analysis of articular surface motion at the ankle and subtalar joint based on distance mapping.”, **Journal of Biomechanics**, Accepted for publication, May 2018.
59. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Jason Toy, Paolo Caravaggi, Ramya Namani, Luca Giuseppe Princi, Stefano Durante, Alberto Leardini: “Experimental evaluation of current and novel approximations of articular surfaces of the ankle joint.”, **Journal of Biomechanics**, Accepted for Publication, April 2018.
60. Sorin Siegler, Paolo Caravaggi, Alberto Leardini, “A novel Cervical Spine Protection Device (CSPD) for reducing neck injuries in contact sports: design concepts and in-vivo testing”, **Journal of Sports Biomechanics**, Accepted for publication, May 2018.
61. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Alessandro Fortunato, Paolo Caravaggi, Erica Liverani, Stefano Durante, Alberto Leardini, A new comprehensive procedure for custom-made design of total ankle replacements: medical imaging, joint modeling, prosthesis design, 3D printing, and testing., Submitted to Computer Methods and Programs in Medicine, April 2018.

Patents

1. Siegler, S., "Apparatus and Method for Determining Load-Displacement and Flexibility Characteristics of a Joint.", USA Pat. No. 5,228,454, 1993.
2. Siegler, S., "Apparatus and Method for Determining Load-Displacement and Flexibility Characteristics of a Joint." Continuation-in-part, USA Pat. No. 5,335,674, 1994.
3. S. Adrian, S. Siegler, R. Hayes, P. Lewin, "Acoustic Angioplasty Catheter with Rotary Drive", USA Pat. No. 5,423,797, 1995.
4. Siegler, S., Kalidindi, S.R., Abusafieh, A., “Swelling-type Copolymeric Composite Material with Self-Fixation Characteristics.”, USA Patent No. 5,824,079, 1998.
5. Siegler, S., Milone, M., Yoganand, G., ”Cervical Spine Protection Apparatus and method of Use.”, USA Patent Number: 8341770B2, Issue Date: 1/1/2013

6. Siegler, S., Hraban, B., LaMontage, EE., Meles, JD., Sun, W., "Orthosis and Method of use for Treatment and Rehabilitation of Dropfoot.", USA Patent Number: US 8,500,668 B2, Issue Date: 8/6/2013
7. Siegler, S., Milone, M., Yoganand, G., "Cervical Spine Protection Apparatus and method of Use.", USA Patent Number: US 8, 528, 113 B2, Issue Date: 9/10/2013
8. Siegler, S., Milone, M., Yoganand, G., "Cervical Spine Protection Apparatus and method of Use.", USA Patent Number: US 8, 683, 612 B2, Issue Date: 4/1/2014
9. Siegler, S., Toy, J., "Prosthetic Ankle with Conic Saddle Shaped Joint.", USA Patent Number: US9925054B2 Issued Date: 3/27/2018.

Refereed Conference Papers (* - Invited paper)

1. Siegler, S. and Seliktar, R., "Simplified Simulation of the Kinetic Features of Human Gait.", Proceeding of the Special Conference of the Canadian Society for Biomechanics., London, Ontario, Canada, pp. 130-131, October 1980
2. Siegler, S., "Quantitative Evaluation of Various Myoelectric Signal Processing Techniques.", Tenth Annual Northeast Bioengineering Conference., Dartmouth College, Hanover, New Hampshire, March 1982.
3. Siegler, S., Moskowitz, G.D. and Freedman, W., " Passive and Active Muscle Forces Developed During Human Walking.", 1982 FASEB Meeting, New Orleans, Louisiana, April 1982.
4. Siegler, S., Moskowitz, G.D. and Freedman, W., " Components of Ankle Muscular Torque During Level Walking.", Biannual Conference of the Canadian Society for Biomechanics, Kingston, Ontario, Canada, Sep. 1982.
5. Siegler, S., Freedman, W., Moskowitz, G.D. and Hillstrom, H.J., "The Variability in Muscle Force - EMG Relationship.", 36th Annual Conference on Engineering in Medicine and Biology, Columbus, Ohio September, 1983
6. Siegler, S. and Carr, E., "A Method for Discriminating Between Spasticity and Contracture at the Ankle Joint During Locomotion in Neurologically Impaired Patients.", Study Institute and Conference: Biomechanics of Human Movement-Application to Ergonomics, Sports and Rehabilitation., Formia, Italy, June 1986.
7. Siegler, S., Chen, J. and Seliktar, R., "A System for Investigating the Kinematics of the Human Ankle and Subtalar Joints Based on Rodrigues Formula and the Screw Axis Parameters.", Study Institute and Conference: Biomechanics of Human Movement-Application to Ergonomics, Sports and Rehabilitation., Formia, Italy, June 1986.
8. Siegler, S., Chen, J. and Schneck, C., " Three Dimensional Kinematics of the Human Ankle and Subtalar Joints.", XI International Congress of Biomechanics. Amsterdam, Holland, June 29-July 3, 1987.
9. Siegler, S. Chen, J. and Schneck, C., " The three dimensional kinematics and Stiffness Characteristics of the Human Ankle and Subtalar Joints.", ASME 1987 Biomechanics Symposium, Cincinnati, Ohio, June 14-17, 1987
10. Siegler, S., Chen, J. and Schneck, C.D., "The effect of injury to the lateral collateral ligaments on the mechanical characteristics of the human ankle joint.", IEEE Engineering in Medicine & Biology Society 10th annual conference., November 3-7, 1988, New Orleans.

11. Siegler, S., Black, S., "A technique to investigate the level of support and the quality of fit of athletic footwear.", 1991 Winter Annual Meeting, Atlanta, Georgia, Dec. 1-6, 1991.
12. Perlberg, G., Siegler, S., Hillstrom, H., "Objective detection of equinus deformity and identification of its sources.", 1991 ASME Winter Annual Meeting, Atlanta, Georgia, Dec. 1-6, 1991.
13. Siegler, S., Nicoletta, D., Kim, H., Fielding, A. and Hayes, R., "A technique to measure, analyze and describe the three dimensional kinematics of the human temporomandibular joint.", 7th Meeting of the European Society of Biomechanics, July 8-11, 1990, Aarhus, Denmark. Abstract published in J. Biomechanics, Vol. 24, No. 6, pp. 477, 1991.
14. Lapointe, S. J., Siegler, S., Berman, A.T., and Arlosoroff, C., "An Instrumented Linkage for the Measurement of the Rotatory Stability of the Human Ankle Complex.", XIV International Society of Biomechanics Congress, Paris, France, July 4-8, 1993.
15. (*) Siegler, S., Lapointe, S., Nobilini, R., and McFadden, J., "An Instrumented Linkage to Measure the Level of Support Provided to the Ankle Joint by High-top Athletic Footwear.", Invited Presentation, Canadian Society of Biomechanics, Symposium on Functional Footwear. August 18-19, 1994, Calgary, Canada.
16. (*) S. Siegler, W. Liu, B. Sennett, and D. Dunbar, "A Technique for the quantitative evaluation of the three dimensional support characteristics of ankle braces.", Podiatric Research Society, 1st meeting, New Orleans, Louisiana, March 20, 1996.
17. Liu, W., Siegler, S., Hillstrom, H., Whitney, K., "Three-Dimensional Kinematics of the Hindfoot Complex During Level Walking.", Int. Symp. On 3-D Analysis of Human Movement, Grenoble, France, July 1-3, 1996. This presentation was invited as a full article publication in the Human Movement Science Journal.
18. Liu, W., Siegler, S., Hillstrom, H., "The Accuracy of a technique to measure the Three-Dimensional Motion of the hindfoot complex.", Int. Symp. On 3-D Analysis of Human Movement, Grenoble, France, July 1-3, 1996.
19. Liu, W., Siegler, S., Whitney, K., Hillstrom, H., "Six-Degrees-of-Freedom Hindfoot Kinematics of rectus and Planus Foot Types During Gait.", PRS Annual Meeting, Palms Spring, CA, February 4-6, 1997.
20. Siegler, S., and Hillstrom, H., "Altered Motions of the Ankle Joint Complex with Mechanical instability.", 5th International Symposium on 3D Analysis of Human Movement.", Chattanooga, Tennessee, July 2-5, 1998. Guiltieri, G., Siegler, S., Hume, E. and Kalidindi, S., "A New Technique to Improve Fixation to Bone Using a Swelling-type Co-Polymeric Material", PACAM VI/DINAME Conference, Rio De Janeiro, Brazil January 4-8, 1999.
22. Hillibrand, A., Harris, B., Nien, Y., Nachwalter, R., Vaccaro, A., Todd, A., and Siegler, S., "A Comparison of Three Systems for Unicortical Fixation in the Lateral Mass of the Cervical Spine.", Cervical Spine Research Society, November 2000, Charleston, South Carolina.
23. (*) Siegler, S., Udupa, J.K., Hirsch, B., Lapointe, S., Hillstrom, H.J., Okereke, E., and Ringleb, S., "New Techniques for Detecting Mechanical Instability at the Ankle and Subtalar Joints.", published and presented as a keynote lecture at the

- International Ankle Symposium, Ulm, Germany, November 30-Dec 3, 2000.
24. Abidi, N.A., Siegler, S., Lomax, L.D., Imhauser, C., Frankel, D., and Gavin, K., "Biomechanical Evaluation of External Stabilizers in the Conservative Treatment of Posterior Tibial Tendon Dysfunction.", American Association of Orthopaedic Surgeon Meeting, March 2001, San Francisco.
 25. Ringleb, S.I., Siegler, S., Udupa, J.K., Hirsch, B.E., and Hillstrom, H.J., "Quantification of Ankle and Subtalar Joint Instability: A New Technique.", International Society of Biomechanics XVIII Congress, July 8-13, 2001, Zurich, Switzerland.
 26. Imhauser, C., Abidi, N., Siegler, S., and Frankel, D., "Biomechanical Evaluation of the Efficacy of External Stabilizers in the Conservative Treatment of Acquired Flatfoot Deformity", International Society of Biomechanics XVIII Congress, July 8-13, 2001, Zurich, Switzerland.
 27. Imhauser, C., Abidi, N., Frankel, D., Gavin, K., and Siegler, S., "The Role of the Posterior Tibialis Tendon as a Stabilizer of the Arch and of the Hindfoot", International Society of Biomechanics XVIII Congress, July 8-13, 2001, Zurich, Switzerland.
 28. Imhauser, C., Abidi, N., Siegler, S., Frankel, D., and Gavin, K., "Biomechanical Evaluation of the Efficacy of External Stabilizers in the Conservative Treatment of Acquired Flatfoot Deformity, Part II", American Orthopaedic Foot and Ankle Society Meeting, July 19-21, San Diego, California, 2001.
 29. Hirsch, B., Udupa, J.K., Okereke, E., Siegler, S., Ringleb, S., and Imhauser, C.W., "3D Kinematics of the Tarsal Joints from Magnetic Resonance Imaging.", Medical Imaging Acquisition and Processing Conference, Wuhan, China, October 22-24, 2001.
 30. Clabbers, K.M., Kelly, J.D., Bader, D., Eager, M., Imhauser, C.W., Siegler, S., "The Effect of Posterior Capsule Tightness on Glenohumeral Translation in the Late-Cocking Phase of Pitching.", AANA, Washington, D.C., April 2002.
 31. (*) Ringleb, S.I., Siegler, S., Udupa, J.K., Imhauser, C.W., Hirsch, B.E., Saha, P.K., Odhner, E., Okereke, E., Roach, N., "The Level of Symmetry in the Anthropometric and Mechanical Properties of the Ankle as determined by a Mechanical/MRI Technique, 4th World Congress of Biomechanics, Calgary, Canada, August 4-9, 2002.
 32. (*) Imhauser, C.W., Abidi, N.A., Frankel, D.Z., and Siegler, S., "The Effect of Damage to the Ligamentous support of the Arch on the Function of the Posterior Tibialis Tendon.", 4th World Congress of Biomechanics, Calgary, Canada, August 4-9, 2002.
 33. Thinnes, J.H., Siegler, S., Daffner, S.D., Vaccaro, A.R., Albert, T.J., and Hilibrand, A.S., "The Impact of Anterior Cervical Fusion Upon Cervical Spine Range of Motion and Overall Neck Flexibility.", 4th World Congress of Biomechanics, Calgary, Canada, August 4-9, 2002.
 34. Spagnuola, C.J., Thinnes, J.H., Ciccotti, M.G., Romani, M., Siegler, S., "Biomechanical Evaluation of the Stabilizing Effect of the Ulnar Collateral Ligament of the Elbow and Comparison of Two Reconstructive Techniques.", American Academy of Orthopaedic Surgeons, Specialty Day, New Orleans, USA, February 5-9, 2003.

35. Thinnis, J.H., Siegler, S., Ciccotti, M.G., Spagnuola, C.J., "A Quantitative Evaluation of Two Reconstructive Techniques of the Elbow Ulnar Collateral Ligament", American Academy of Orthopaedic Surgeons, New Orleans, USA, February 5-9, 2003
36. K. Balasubramanian, S.Siegler, N. Hawkins, A. Hilibrand, "Comparison of the passive stabilization provided to the human cervical spine by three different cervical collars" ASB Conference, Portland, OR 9/8/04-9/11/04.
37. V. Saldanha, S. Siegler, B.E. Hirsch, J.K. Udupa, "Measurement of Lateral Ligament Length under Load Using 3D Stress MRI.", 2nd International Ankle Symposium, University of Delaware, Newark, Delaware, USA, October 15-16, 2004.
38. S. Pirani, S.Sielger, R.Brand, W. Morrison, D. Hodges, J.K. Udupa "Correction of Tarsal Deformities and Displacements in Congenital Clubfoot with Ponseti Treatment: When & How Does it Occur - A 3D MRI Analysis.", Paediatric Orthopaedic Society of North America, Orlando, Florida, USA, May 2005.
39. Imhauser, C., Siegler, S., Brand, R., Toy, J., "The Development And Evaluation Of a 3-Dimensional, Image-Based, Patient-Specific, Dynamic Model Of The Hindfoot", International Society of Biomechanics, Cleveland, Ohio, USA, August 1-5, 2005.
40. Suzanne Jaffe Walters MD, Tim Ackerman DO, Linda A. Martin MD, James A. Tom MD, Patrick Stanley Jr BS, Sorin Siegler PhD, Paul A. Marchetto MD, "The Effects of Tunnel Dilation on the Mechanical Properties of Achilles Tendon Allograft Fixed in the Tibia with Interference Screws.", AOSSM 2006 Annual Meeting, June 29 – July 2, 2006, Hershey, Pennsylvania
41. Suzanne Jaffe Walters MD, Tim Ackerman DO, Linda A. Martin MD, James A. Tom MD, Patrick Stanley Jr BS, Sorin Siegler PhD, Paul A. Marchetto MD, "The Effects of Tunnel Dilation on the Mechanical Properties of Allografts Fixed in the Tibial Tunnel", Annual Meeting of the American Association of Orthopaedic Surgeons (AAOS), February 14-18, 2007, San Diego, California, USA.
42. R. Mahmoodian, S. Siegler, R.A. Brand, S. Pirani, D. Hodges and J. Udupa, "The Effect of Loads Applied to the Infant Congenital Clubfoot Through Serial Casting on Shape, Growth and Ossification of Hindfoot Anlagen.", XXIth Congress of International Society of Biomechanics, Taipei, Taiwan, July 1-5, 2007
43. C.W. Imhauser, S. Siegler, J. Toy, „Subject-Specific Computational Models of the Hindfoot Reveal that Variability in Osseous Geometries Drive Differences in their Mechanical Behavior.“, XXIth Congress of International Society of Biomechanics, Taipei, Taiwan, July 1-5, 2007.
44. Carl W Imhauser, Sorin Siegler Jayaram K Udupa, Jason R Toy, "A Relationship Between Hindfoot Morphology and Mechanical Behavior", 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 2008 *ORS #: 1580, Best Poster Award*
45. C.W. Imhauser, S. Siegler, J. Toy, "Relationship between morphology of the ankle joint complex and its mechanics revealed through subject-specific models", International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008.
46. R. Mahmoodian, S. Siegler, R.A. Brand, S. Pirani, D. Hodges and J. Udupa, "The

- Effect of Loads Applied to the Infant Congenital Clubfoot through Serial casting on Shape, Growth and Ossification of the Hindfoot Anlagen.”, International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008.
47. Pirani, S., Siegler, S., Hodges, D., Mahmoodian, R., Udupa, J., Morrison, W., Brand, R., and Ponseti, I., “The Mechanism of Clubfoot tarsal Anlagen Deformity Correction During Ponseti Treatment.”, 2009 Pediatric Orthopaedic Society of North America, POSNA Annual Meeting, April 30 – May 2, 2009, Boston, MA, USA.
 48. B. Winkelstein, J. Udupa¹, A. Hilibrand², J. Schuster¹, S. Siegler³, B. Hirsch³, A. Borthakur¹, and E. Melham¹, “Novel Imaging Approach Using 3D Stress MRI to Detect Altered Biomechanics in Neck Pain Patients”, BMES 2009 Annual Fall Scientific Meeting, Pittsburgh, PA, October 7-10, 2009.
 49. Mahmoodian, R., Siegler, S., Capaldi, F., “Development of a finite element framework for studying growth of cartilage anlage.”, Summer Bioengineering Conference 2009 of the ASME, Lake Tahoe, California, June 17-21, 2009.
 50. Voegelé KK, Siegler S, Bonnan MF, Fowler EK, Lacovara KJ. ”Using MSC Adams to determine the effects of articular cartilage cap shape and thickness on the dynamics of the elbow joint of a titanosaurian sauropod”. 74th Society of Vertebrate Paleontology Annual Meeting, Berlin, Germany, April 2014.
 51. Paolo Caravaggi, Alberto Leardini¹, Giada Lullini¹, Sorin Siegler, “A Novel Device For Protecting and Restraining Head and Neck in Tackle Football Players”, ISB – International Congress of the International Society of Biomechanics, Glasgow, Scotland, July 12-16, 2015.
 52. Sorin Siegler, Ramya Namani, Claudio Belvedere, Jason Toy, Wagdi Mankarios, Alberto Leardini, “Variations In Morphology Of The Articular Surfaces Of The Ankle Effect Its Kinematics and Load-Transfer Characteirstics”, ISB – International Congress of the International Society of Biomechanics, Glasgow, Scotland, July 12-16, 2015.
 53. Ramya Namani, Sorin Siegler, Jay Parvizi “The Effect Of Variations In The Morphology Of The Hip On Femoral/Acetabular Interference Pattern During Motion”, ISB – International Congress of the International Society of Biomechanics, Glasgow, Scotland, July 12-16, 2015.
 54. Ramya Namani, Sorin Siegler, Jay Parvizi “Differences In Morphological Parameters and Patterns Of Interference At The Hip In Normal and FAI Patients”, ISB – International Congress of the International Society of Biomechanics, Glasgow, Scotland, July 12-16, 2015.
 55. Fortunato, A.*, Liverani, A., Leardini, A., Belvedere, C., Siegler, S., Ceschini, L., Ascari, A., “Fabrication of Co-Cr-Mo endoprosthetic ankle devices by means of Selective Laser Melting (SLM)”, Presented at the 26 CIRP Design Conference, , Stockholm, Sweden, June 2016.
 56. Belvedere, C., Siegler, S.*, Ensini, A., Caravaggi, P., Durante, S., Namani, R., Toy, J., Leardini, A., “Effect of Variations in Ankle Surface Morphology on Joint Kinematics and Load-Transfer Characteristics”, Presented at the Foot International, FI-2016 (i-FAB, EFAS, DAF), Berlin, Germany, June 2016.
 57. Belvedere C.*, Siegler S., Ensini A., Fortunato A., Caravaggi P., d’Amato M., Durante S., Leardini A., “A new computer-assisted procedure including medical

- Imaging, 3D modeling and printing for personalized joint replacement: the case of total-ankle.”, 16th Annual Meeting, International Society of Computer Assisted Orthopaedic Surgery, Osaka, Japan, June 2016.
58. Belvedere, C.*, Siegler, S., Ensini, A., Caravaggi, P., Durante, S., Leardini, A., “In-silico and in-vitro validation of original articulating surfaces for total ankle replacement”, 24th Annual Meeting, European Orthopaedic Research Society, Bologna, Italy, September 2016.
 59. Eric M Padegimas, Nicole Weikert, Samuel Greulich, Sorin Siegler, Asif Ilyas, and Christopher Jones, “Metacarpal Neck Fracture Fixation: a Biomechanical Comparison of Three Techniques”, The American Association of Hand Surgery Annual Meeting, Waikoloa, Hawaii, January 10-14, 2017.
 60. Alberto Leardini , Claudio Belvedere , Andrea Ensini , Paolo Caravaggi , Stefano Durante , Alessandro Fortunato , and Sorin Siegler, “Custom design and manufacturing of total ankle replacements: in-silico and in-vitro validation”, 2nd International Conference in 3D printing in Medicine, Mainz, Germany, May 19-20, 2017.
 61. A. Leardini , C. Belvedere , E. Liverani , A. Ensini , P. Caravaggi , S. Siegler , A. Fortunato, “Primi studi pre-clinici: ottimizzazione stampa, test meccanici sulle componenti, e relativi test cinematici su preparati anatomici”, 1st IDBN (Italian Digital Bio-Manufacturing Network, Bologna, Italy, May 25-26, 2017.
 62. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Paolo Caravaggi, Alessandro Fortunato, Stefano Durante, Alberto Leardini, 1st IDBN (Italian Digital Bio-Manufacturing Network, Bologna, Italy, May 25-26, 2017.
 63. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Paolo Caravaggi, Alessandro Fortunato, Alberto Leardini, “Personalized Design of Small Endoprosthesis Results in Better Performance: The Case of Total Ankle Replacement.”, ISB International Congress, Australia, July 21-25, 2017.
 64. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Paolo Caravaggi, Alessandro Fortunato, Alberto Leardini, “Custom design and manufacturing of total ankle replacements: in-silico and in-vitro validation”, 2nd International Conference on 3D printing in Medicine, Munich, Germany, May 19-20, 2017.
 65. Christopher M Jones MD, Eric M Padegimas MD, Nicole Weikert MS, Samuel Greulich BS, Asif M Ilyas MD, and Sorin Siegler PhD, “Headless Screw Fixation of Metacarpal Neck Fractures: a Biomechanical Comparative Analysis”, AAHS (American Association of Hand Surgery) Annual Meeting, Arizona, USA, January 13-16, 2016.
 66. Christopher M Jones MD, Eric M Padegimas MD, Nicole Weikert MS, Samuel Greulich BS, Asif M Ilyas MD, and Sorin Siegler PhD, “Headless Screw Fixation of Metacarpal Neck Fractures: a Biomechanical Comparative Analysis”, ASSH (American Society for Surgery of the Hand) 72nd Annual Meeting, California, USA, September 7-9, 2017.
 67. Claudio Belvedere, Sorin Siegler, Andrea Ensini, Paolo Caravaggi, Alessandro Fortunato, Alberto Leardini, “Personalized design of small endoprosthesis results in better performances: The case of total ankle replacement.”, International Society of Biomechanics, Brisbane, Australia, July 23-25, 2017.
 68. Sorin Siegler, Tobias Konow, Claudio Belvedere, Andrea Ensini, Rewati Kulkarni,

- Alberto Leardini, "Analysis of articular surface motion at the ankle and subtalar joints using distance mapping.", International Society of Biomechanics, Brisbane, Australia, July 23-25, 2017.
69. Sorin Siegler, Maui Jepsen, Francois Lintz, "Surface-to-surface interaction at the joints of the ankle complex and foot in varus and valgus deformities", International Foot and Ankle Biomechanics Congress, New York, New York, USA April 8-11, 2018.
 70. Sorin Siegler, Vishnuvardhan Balakrishnan, Claudio Belvedere, Paolo Caravaggi, Alberto Leardini, "Validation of a Subject-specific Computational Models of the Ankle Joint Complex", International Foot and Ankle Biomechanics Congress, New York, New York, USA April 8-11, 2018.
 71. Claudio Belvedere, Sorin Siegler, Paolo Caravaggi, Andrea Ensini, Alberto Leardini, "Experimental evaluation of custom-made morphological approximations of the ankle articular surfaces", International Foot and Ankle Biomechanics Congress, New York, New York, USA April 8-11, 2018.
 72. Alberto Leardini, Claudio Belvedere, Paolo Caravaggi, Andrea Ensini, Sorin Siegler, "Flexibility in the ankle joint after implantation of custom-made artificial articular surfaces", International Foot and Ankle Biomechanics Congress, New York, New York, USA April 8-11, 2018.
 73. Sorin Siegler, Maui Jepsen, Francois Lintz, "Surface-to-surface interaction at the joints of the ankle complex and foot in varus and valgus deformities", World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018
 74. Claudio Belvedere, Sorin Siegler, Paolo Caravaggi, Andrea Ensini, Alberto Leardini, "Custom-made morphological approximations of the ankle articular surface: In Silico and in vitro experimental evaluations.", World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018
 75. Claudio Belvedere, Gilda Durastanti, Sorin Siegler, Stefano Durante, Alberto Leardini, "Comparison of ankle articular surfaces among morphological models derived from different medical imaging technologies", World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.
 76. Sorin Siegler, Vishnuvardhan Balakrishnan, Yusuf Dikici, Claudio Belvedere, Paolo Caravaggi, Alberto Leardini, "Validation of a Subject-specific Computational Model of the Ankle Joint Complex", World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.

Keynote and Award Presentations

1. "The Biomechanics of Ankle Instability and its Conservative and Surgical Treatment.", Keynote Speaker, Podiatric Research Society, 1st inaugural meeting, March 20, 1996, New Orleans, Louisiana.
2. "In Search of Our Common Language Describing Human Movement - Can we bridge the Gap Between the Laboratory and the Readership?", Special Event Keynote Speaker, Int. Symp. On 3-D Analysis of Human Movement, Grenoble, France, July 1-3, 1996.
3. "New Techniques for Detecting Mechanical Instability at the Ankle and the

- Subtalar Joints.”, Keynote Speaker, International Ankle Symposium, Ulm, Germany, December 2000.
4. “Advances in Image-Based Biomechanics of the Human Ankle”, Keynote Speaker, 1st International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008
 5. “Morphological and Functional considerations in the development of total ankle replacements”, Keynote Speaker, Annual Scientific Congress of the Taiwanese Society of Biomechanics, October 14, 2017

Invited Talks and Presentations

1. Seminar presentation, Department of Mechanical Engineering and Mechanics, Lehigh University, Pennsylvania, " Three-Dimensional Kinematics of Rigid Bodies.", Invited by Dr. Arkady Voloshin, September 1990.
2. Seminar presentation, Orthopaedic Residency Program, Department of Orthopaedic Surgery, Osteopathic Hospital, Philadelphia, Pennsylvania, "Theoretical and Experimental Techniques in the Study of Human Kinematics.", Invited by Dr. H. Hillstrom, April 1992.
3. Seminar presentation, Department of Orthopaedic Surgery and Department of Physical Education, University of Calgary, Alberta, Canada, "Three-Dimensional Kinematics and Flexibility Characteristics of the Human Ankle Joint.", Invited by Dr. Benno Nigg, June 1992.
4. Seminar Presentation, Seminar at the Medical Imaging Processing Division, Department of Radiology, University of Pennsylvania Medical School, "Three-Dimensional kinematics and flexibility characteristics of the human ankle and subtalar joints.", Invited by Dr. J. Udupa, Philadelphia, PA, 1997.
5. Seminar Presentation, "Techniques to measure and describe the three-dimensional kinematic characteristics of anatomical joints.", Department of Orthopaedic Surgery and Human Performance Laboratory, University of Calgary, Calgary, Canada, Invited by Dr. B. Nigg, May 1997.
6. Seminar Presentation, “3D sMRI: A Method for the Structural and Functional Study of Joints.”, Grand Rounds, Department of Radiology, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, April 19, 2005. Shared presentation – J.K. Udupa and S. Siegler
7. Seminar Presentation, “3D sMRI: A Method for the Structural and Functional Study of Joints.” Department of Orthopaedic Surgery, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, July 13, 2005. Shared presentation – J.K. Udupa and S. Siegler
8. Invited Tutorial Lecture, “Biomechanics of the Foot and Ankle”, XXIth Congress of the International Society of Biomechanics, Taipei, Taiwan, July 1-5, 2007.
9. Invited Tutorial Lecture, “Biomechanics of the Developing Human Foot and Ankle”, 1st International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008
10. Invited presentation, “The Forgotten Danger-Risk of Injury and Protection of the Cervical Spine in American Football and other High Impact Activities.”, 5th

Annual Philadelphia Spine Research Symposium, Philadelphia, PA, December 9, 2009

11. Invited presentation, “Morphological and Functional considerations in the development of total ankle replacements”, Keynote Speaker, Annual Scientific National Taiwan University, October 17, 2017

CONFERENCE ORGANIZATION

- Session Chairman, 36 Annual Conference on Engineering in Medicine and Biology., Columbus, Ohio, USA, September 1983
- Session Chairman, Session on Joint Mechanics Session, 1987 ASME Biomechanics Symposium held in Cincinnati, Ohio, USA, June 1987
- Session Chairman, Session on Ankle Joint Instability, Podiatric Research Society, 1st inaugural meeting, New Orleans, Louisiana, USA, March 1996
- Chairman, Symposium on Foot and Ankle Biomechanics, The International Society of Biomechanics, 1999 Annual Conference, Calgary, Canada. August 1999
- Chairman of the Novel Award Ceremony for the best paper on Foot and Ankle Biomechanics, held at the International Society for Biomechanics in Calgary, Canada,. August 1999
- Co-Chairman, Ankle Biomechanics, International Ankle Symposium Ulm, Germany. November 2000
- Chairman, Discussion Forum on Standards for Description of Kinematics of the Ankle, International Society of Biomechanics Congress, Zurich, Switzerland, July 2001
- Chairman and Symposium Organizer, Ankle Biomechanics, 4th World Congress of Biomechanics, Calgary, Canada, August 2002
- Organized and chaired three sessions: Foot and Ankle 1, Foot and Ankle 2, Foot and Ankle 3, at the XXIth Congress of the International Society of Biomechanics in Taipei, Taiwan, July 2007
- Member of the Scientific Committee, 1st meeting of the International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008., September 2008
- Chairman, Consensus meeting on Standards for Description of Kinematics for the Foot and Ankle. 1st meeting of the International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008.
- Organizer and Chairman. Invited session on Medical Imaging Analysis 1st meeting of the International Foot and Ankle Biomechanics Society, Bologna, Italy, September 4-6, 2008.
- Session Chairman, Ankle Joint, Foot International, FI-2016 (i-FAB, EFAS, DAF), Berlin, Germany, June 2016.
- Session Chairman and Organizer, Special Session on Total Ankle Replacement, International Foot and Ankle Meeting, New York, New York, USA, April 8-11, 2018.

FUNDED PROJECTS

1. "A New Total Ankle Replacement (TAR) with Conic Saddle Shaped Joint", The Coulter Foundation, \$190,900, 1/1/2014 to 3/30/2016, Principal Investigator.
2. "Skeletal Development in Clubfoot Treatment.", National Institute of Health, \$367,886, 9/1/2006 – 7/31/2010, Principal Investigator.
3. "Novel Imaging approach Using 3D Stress MRI to Detect Altered Biomechanics in Patients with Evoked Neck Pain.", Cervical Spine Research Society, \$60,000, 1/1/2008 – 12/30/2008, Co-Principal Investigator.
4. "Biomechanical Support Characteristics of Athletic Tape.", StingFree Corp., \$13,000, 11/1/2006 – 10/30/2008, Principal Investigator.
5. "Biomechanics of Foot/Ankle Injuries using 3D Imaging", National Institute of Health, \$906,021, 4/1/2000 to 3/30/2004, Co-Principal Investigator.
6. "The Impact of Anterior Cervical Fusion Upon Segmental Cervical Spine Kinematics and Overall Neck Flexibility ", Cervical Spine Research Society, \$28,900, 4/1/2001 to 3/30/2002, Joint Principal Investigator with Dr. A. Hillibrand from Thomas Jefferson University,
7. "Biomechanical Model of the Human Foot"., Temple University School of Podiatric Medicine, \$12,000, 7/1/1999 to 6/30/2000, Principal Investigator.
8. "New Curriculum Robotics/Control Undergraduate Laboratory", National Science Foundation, \$394,036, 7/1/1997 – 6/30/2000, Co-Principal Investigator.
9. "Design and Development of a new Class of Swelling Type Composite Materials for Cementless Hip Implants." The Whitaker Foundation, 70,000, 1/1/98 – 6/30/99, Joint Principal Investigator.
10. "Effect of constraining the ankle through a semi-rigid brace on the mechanics of the knee joint during functional activities", Active Ankle Corp., \$5,000, 8/1/97-10/31/97, Principal Investigator.
11. "Evaluation of the Support Characteristics of Ankle and Knee Braces.", Active Ankle Corp., \$18,000, 8/1/96 - 7/39/97, Principal Investigator.
12. "Varus Knee Osteoarthritis: Lower Limb Re-alignment.", Pennsylvania College of Podiatric Medicine, 10,800, 7/1/96 - 6/30/97, Principal Investigator.
13. "Passive Restraint Characteristics of Extrication Collars.", TECNOL Corp., \$30,000, 4/1/96 - 9/1/96, Principal Investigator,
14. "Passive Protective Characteristics of Emergency Collars.", Philadelphia Cervical Collar Corp, \$ 7,500, 12/1/1995 - 12/30/1996, Principal Investigator.
15. "The Level of Support and Heel Pain Control Characteristics of External Ankle Stabilizers.", AOA Corporation and Active Ankle Corporation, \$35,000, 7/1/95 - 9/30/95, Principal Investigator
16. "Design and Development of a new Class of Swelling Type Composite Materials for Cementless Hip Implants.", The Whitaker Foundation, 180,000, 1/1/95 - 12/30/97, Joint Principal Investigator.
17. "Six Degrees of Freedom Hindfoot Kinematics and Kinetics", American Podiatric Medical Association, \$22,200, 9/1/94 - 8/30/95, Principal Investigator.
18. "Lower Extremity Biomechanics in Posture and Locomotion.", American Podiatric Medical Association,, \$11,700, 10/1/93 - 6/30/94, Principal Investigator."
19. "An Instrumented Linkage for Measuring the Laxity of the Human Knee.", Advanced Technology Center of Southeastern Pennsylvania and D.H. Medical Technology, \$25,000, 4/1,1993 - 9/31,1993, Principal Investigator.

20. "Cervical Spine Mobility and Stiffness: The Effects of Age, Osteoarthritis and Posture", Foundation of Physical Therapy, \$14,200, 7/1/93-6/30/95., Principal Investigator.
21. "In-vivo Measurement of Cervical Spine Mobility and Stiffness: The Effect of Posture, Age, and Degenerative Changes", Arthritis Foundation, \$20,000, 7/1/93-6/30/95., Principal Investigator
22. "Biomechanics of the Foot and Ankle", American Podiatric Medical Association, \$48,500, 7/1/91 - 6/3/93, Principal Investigator.
23. "Quantitative Evaluation of the Level of Support and Quality of Fit of High-Top Athletic Shoes.", Reebok International, \$17,644, 7/1/90 - 12/31/90, Principal Investigator.
24. "Quantitative Evaluation of the Degree of Equinus Deformity Pre and Post Treatment.", American Podiatric Medical Association, \$32,009, 10/1/89 - 9/30/91. Principal investigator.
25. "Graphics/Computation Facility" - DRR-BRS Shared Instrumentation Grant, National Institute of Health, \$197,135, 12/1/1988 - 11/30/89, Co-Principal Investigator,
26. "Active Surgical Manipulator.", Source: Advanced Technology Center of Southeastern Pennsylvania and Leonard Medical Company, \$115,675, 9/1/1988-8/30/1989., Joint Principal Investigator
27. "Engineering Education Grant.", The Society of Manufacturing Engineering Education Foundation, \$8,875, 5/15/1988-5/14/1989, Principal Investigator.
28. "Stabilizing Role of the Ligaments of the Human Ankle and Subtalar Joints.", National Institute of Arthritis, Musculoskeletal and Skin Diseases, NIH Competing Continuation, \$253,478, 9/1/1988-8/30/1992., Principal Investigator.
29. "Instrument Support Arm and Hip Traction Device for Arthroscopic Surgery. Second Generation Powered Assist Manipulator (SAM).", Advanced Technology Center of Southeastern Pennsylvania and Leonard Medical Company, \$94,586, 9/1/1987-8/30/1988, Principal Investigator.
30. "FLEXTREN- A Lower Leg Rehabilitation Machine.", Moss Rehabilitation Hospital, \$3,200, 9/1/1986-7/1/1987, Principal Investigator.
31. "A Mechanical Support Arm for Arthroscopic Instruments.", Advanced Technology Center of Southeastern Pennsylvania and Leonard Medical Company, \$94,481, 9/30/1985-9/30/1986., Principal Investigator
32. "Stabilizing Role of Human Ankle and Subtalar Ligaments.", National Institute of Arthritis, Musculoskeletal and Skin Diseases, NIH, \$205,959, 9/30/1984-3/31/1988, Principal Investigator.

RESEARCH COLLABORATION

Rizzoli Orthopaedic Institute, Bologna, Italy; Department of Radiology, University of Pennsylvania, Philadelphia, PA, USA; Royal Colombian Institute, Vancouver, Canada; The Rothman Institute, Thomas Jefferson University, Philadelphia, PA, USA; School of Medicine, Temple University, Philadelphia, PA, USA; Moss Rehabilitation Hospital, Philadelphia, PA USA;

TEACHING AND STUDENT SUPERVISION

Courses Taught and Developed

Undergraduate: Statics; Dynamics; Intermediate Dynamics; Mechanics of Materials; General Mechanics; Dynamics Systems; Mechanics of Biological Tissue; Mechanics of Human Joints; Mechanics of Human Motion; Introduction to Robot Technology; Mechanics of Robot Manipulators; Industrial Applications of Robots; Experimental Mechanics; Senior Design.

Graduate: Advanced Dynamics; Clinical Biomechanics; Mechanics of Biological Tissue; Mechanics of Human Joints; Mechanics of Human Motion; Introduction to Robot Technology; Mechanics of Robot Manipulators; Industrial Applications of Robots;

Graduate Students/Post-Doc Supervision

Post-Doctoral Fellows

C Chen, J., Ph.D., Department of Mechanical Engineering and Mechanics, Topic: Finite Elements Modeling of the Human Temporomandibular Joint, January 1, 1990 to August 1991., Presently Dr. Chen is an Assistant Professor (Tenure track and candidate for promotion and tenure) in the Department of Mechanical Engineering at Purdue University

Doctoral students

1. J. Chen, "The Three Dimensional Kinematics and Flexibility Characteristics of the Human Ankle and Subtalar Ligaments. ", Ph.D. in MEM, Completed October 1989. (C)
2. Stephan J. Lapointe, "The Effects of Damage to and Surgical Repair of the Lateral Ankle Ligaments on the Passive Flexibility of the Hindfoot". Ph.D. in Biomedical Eng., Completed June 1996.
3. Phil McClure, "In-vivo Measurement of Cervical Spine Mobility and Stiffness: The Effects of Posture, Age and Degenerative Changes.", Ph.D. in Biomedical Eng., Completed June 1996.
4. Abdel Abusafieh, "Development of a New Class of Self-Anchoring Swelling Type Implants", Co-Advisor with Dr. Kalidindi from Materials Engineering Dept., Ph.D. in Materials Eng., Completed December 1996.
5. Wen Liu, "Mechanics and Dynamics of the Ligamentous Deficient Ankle Joint.", Ph.D. I Biomedical Eng., Completed July 1997.
6. Robert Nobilini, "A New Method for Evaluating the Structural Characteristics of Biological and Artificial Joints". Ph.D. in MEM, Completed June 1998.

7. Gina Gualtieri, "Implant-bone interface for a new swelling type composite implant material", Co-Advisor with Dr. Kalidindi from Materials Engineering Dept., Ph.D. in Biomedical Eng., Completed, June 1999.
8. N. Nien, "Swelling-Type Co-polymeric Orthopaedic Implants", In-Progress, Co-Advisor with Dr. Kalidindi from Materials Engineering Dept., Estimated Completion date: December 2000.
9. S. Ringleb, "Biomechanics Modeling of the Human Foot", Completion Date, July 2002.
10. C. Imhauser, "An FEM model of the human foot for investigating arch support", Completion date – July 2002.
11. J. Toy, "A hybrid, dynamic finite-elements model of the human foot", Completion date, July 2009.
12. R. Mahmoodian, "Skeletal Development in Infant Clubfoot Treatment", Completion Date, July 2010
13. R. Namani, "The relation between variations in joint morphology and joint function"
14. Kristyn Voegel, (Co-supervising with Dr. Lacovera) "Biomechanical Modelling of Elbow kinematics and load carrying capacity of bones in the Titanosaurus.
15. Tobias Konos,

Master's students

1. E. Carr, "A Quantitative Method for Discriminating Between Spasticity and Contracture at the Ankle Joint During Locomotion in the Neurologically Impaired Patient.", M.Sc. in Biomedical Eng., Completed June 1986.
2. J.J. Block, "The Structural and Mechanical Characteristics of the Collateral Ankle Ligaments.", M.Sc. in Biomedical Eng., Completed June 1986.
3. R. Zickel, " Powered Assist Manipulator for Orthopedic Surgery.", M.Sc. in MEM, Completed, July 1988.
4. C.Tihansky, "Joint Surface motion and Contact at the Human Ankle and Subtalar Joints.", M.Sc. in Biomedical Eng., Completed, August 1988.
5. E. Plasha, " Development of Quantitative Diagnostic Technique for Injuries to the Collateral Ligaments of the Ankle Joint. ", M.Sc. in MEM, Completed, June 1989.
6. Daniel P. Nicolella, "Kinesiology of the normal and diseased Temporomandibular joint", M.Sc. in MEM, Completed, June 1990.
7. Dinghua Wang, " Stabilizing role of the ligaments of the human ankle joint.", M.Sc. in MEM, Completed, June 1990.
8. Gil Perlberg, "A Quantitative Diagnostic Technique for Discriminating Between Spasticity and Contracture at the Ankle Joint in Patients with Equinus Foot Deformity.", M.Sc. in MEM, Completed, June 1991.
9. Suzan Black, " A Technique to Investigate the Level of Support and Quality of Fit of Athletic Shoes.", M.Sc. in MEM, Completed, June 1991.
10. Robert Nobilinni, " The Kinesiology of the Human Temporomandibular Joint.", M.Sc. in MEM, Completed, June 1992.
11. Brian Maurer, " Quantitative Diagnosis of Equinus Deformity and assessment of its etiology.", M.Sc. in Biomedical Eng., Completed, September 1992.

12. Joe McFadden, "Objective Assessment of the Support Provided to the Ankle by Military Boots.", M.Sc. in Biomedical Eng., Completed, June 1996.
13. Anita Vemuganti, M.Sc. "The Mechanics of bone/implant interface for a swelling type co-polymeric material"., Co-Advisor with Dr. Kalidindi, Materials Engineering Dept., M.Sc. in Biomedical Eng., Completed, June 1997
14. Dean Werner, "The effect of Wrist Motion and Wrist Loading on the Kinematics of the Distal Radio-Ulnar Joint.", M.Sc. in Biomedical Eng., Completed, July 1997.
15. D'Addesi Leonard, "Torques involved in the Development of Femoral Torsion.", M.Sc. in Biomedical Eng., Completed, June 1998.
16. Binu Louise Jacob, "Evaluation of Self-Anchoring Bone Implants in Dynamic Loading.", Co-Advisor with Dr. Kalidindi, Materials Eng. Dept., M.Sc. in Materials Eng., Completed June 1998.
17. Christopher Thompson, "The Biomechanics of Cervical Collars", M.Sc. in MEM, Completed, August 1998.
18. Charles Bartish, "The Effect of wearing a Semi-Rigid Ankle Orthosis on the Biomechanics of the Knee during functional Activities", M.Sc. in MEM and in Biomedical Eng., Completed, September 1998.
19. Ron Neff, "The Support Characteristics of Athletic Taping Technique for the Healthy Ankle Joint.", M.Sc. in Biomedical Eng., Completed 1998.
20. Jian Guo, "Application of a swelling type composite material for orthopaedic bone fixation.", M.Sc. in MEM, Completed, November 1998.
21. Carl Imhauser, "Biomechanics of External Stabilizers for conservative treatment of flatfoot deformity", M.Sc. in MEM, August 2000.
22. Tony Pelegrino, "Transforaminal Lumbar Interbody Fusion: The Effect of Various Instrumentation Techniques on the Flexibility of the Lumbar Spine.", August 2000.
23. David Tack, "Studies, theory, design, automation and simulation of the Neck Flexibility Tester", August 2000.
24. Mathews Johnson, "An Interactive Multimedia Robotics Educational Environment.", completed 2001.
25. John Thinnes, "Biomechanics of Surgical Reconstruction of the human elbow.", Completed August 2002.
26. Naomi Hawkins, "Effect of surgical cervical spine decompression and fusion on the range of motion and flexibility of the cervical spine.", complete June 2004
27. Lydia Lee, "A new image-based diagnosis of ankle ligament injuries based on ligament insertion-to-insertion length change under load.", complete June 2004
28. Hemanth Gadikota, "", Completed July 2007.
29. Jeremi Leasure, "Structure and Composition of the developing human tarsal bones", Completed, December 2008.
30. Amanda Comeau, "Model-Based evaluation of a Total Ankle replacement", Completed 2008.
31. Mary Milone, "A cervical spine protective device for adolescent tackle football", Completed 2010
32. Sophia Tethe, "An image-based surgical planning algorithm for femoral Acetabular Impingement", Completed 2011
33. Phitia Philip, "Image-based analysis of the effect of clubfoot treatment in skeletal development", Completed September 2013.

34. Brian Gravey, “A system to monitor manipulative forces during conservative serial casting treatment of infant congenital clubfoot.”, Completed 2011
35. Damani Seale, “Stiffness characteristics of Ankle-Foot Orthosis”, Completed 2011
36. N. Meyers, “Design and Evaluation of a New Total Ankle Replacement with a Truncated Conic Saddle Shape. Completed June 2013.
37. R. Yadava, “Surgical planning and instrumentation for Total Ankle Replacement Surgery.” Completed June 2013.
38. Wagdi Manakarios, “Morphological characteristics of the Talo-crural joint”, Completed, June 2014
39. Deepak Padmanabhan – In Progress
40. Rewati Kulkarni – In Progress
41. Tobias Konow – In Progress
42. Maui Jespen
43. Yusuf Dikici
- 44.

OTHER PROFESSIONAL ACTIVITIES

Journal Reviewing

- Foot and Ankle International, Associate Editor
- Journal of Biomechanics
- Journal of Clinical Biomechanics
- Journal of Orthopaedic Research
- Clinical Orthopaedic and Related Research
- American Journal of Sports Medicine
- Journal of Applied Biomechanics
- Journal of Forensic Biomechanics
- Journal of Bone and Joint Surgery

Administrative Positions at Drexel University

- **Chairman**, Tenure and Promotions Committee, Department of Mechanical Engineering and Mechanics, *2016 - 2017*.
- **Chairman**, ABET Accreditation Committee, Department of Mechanical Engineering and Mechanics, *2013-2014*
- **Chairman**, Software Committee, Department of Mechanical Engineering and Mechanics, *2009 – 2010*
- **Coordinator**, Biomechanics Concentration, Department of Mechanical Engineering and Mechanics, *2006 – 2010*.

Consulting Services

- Biomechanics Expert Consulting Services to the legal community on Automobile Injury Analysis, Product Liability, Personal Injury, Patent Infringement, and Work Related Accidents.

- Biomechanics Expert Consulting Service to Industry on Product Design and Product Testing and Evaluation.