

Biographical Sketch

Joshua S. Rovick, Ph.D.

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BIOGRAPHICAL SKETCH

NAME Joshua S. Rovick, Ph.D.	POSITION TITLE Research Engineer/ Biomechanician	BIRTHDATE March 10, 1957
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EDUCATION			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Illinois, Urbana, IL	B.S.	1980	Mechanical Engineering
Northwestern University, Evanston, IL	M.S.	1982	Biomedical Engineering
Northwestern University, Evanston, IL	Ph.D.	1993	Biomedical Engineering

RESEARCH AND PROFESSIONAL EXPERIENCE	
1994-Present	<ul style="list-style-type: none"> - <u>Research Associate</u>, Rehabilitation Engineering Program and Prosthetics Research Laboratory, Northwestern University Medical School, Chicago, IL - Development and evaluation of automated systems for design, fabrication and fitting of prostheses and orthoses. Mathematical modeling, analysis and computer visualization of the musculoskeletal system and associated assistive devices. Design and development of prosthetic and orthotic components and experimental test rigs.
1986-1993	<ul style="list-style-type: none"> - <u>Research Engineer</u>, Rehabilitation Engineering Program and Prosthetics Research Laboratory, Northwestern University Medical School, Chicago, IL
1983-1986	<ul style="list-style-type: none"> - <u>Associate Director</u>, Biomechanics Research Laboratory, Veterans Administration Medical Center, West Roxbury, MA - Coordination and planning of research projects on joint biomechanics, total joint replacement, and orthotic devices. Design and development of orthopaedic devices and experimental test rigs. Mathematic and computer modeling of biomechanical systems.
1984-1986	<ul style="list-style-type: none"> - Council Member, Industrial Advisory Council, Wentworth Institute of Technology, Boston MA - Advisory position with regard to course development and operation of cooperative studies program. Training of cooperative students.
1980-1982	<ul style="list-style-type: none"> - <u>Research Assistant</u>, Rehabilitation Engineering Program, Northwestern University, Chicago, IL
1979-1980	<ul style="list-style-type: none"> - <u>Laboratory Technician</u>, Department of Mechanical Engineering, University of Illinois, Urbana, IL
1977-1978	<ul style="list-style-type: none"> - <u>Laboratory Technician</u>, Department of Food Science, University of Illinois, Urbana, IL
1974-1977	<ul style="list-style-type: none"> - <u>Laboratory Technician</u>, Department of Physiology, Rush-Presbyterian Saint Luke's Medical Center, Chicago, IL

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PROFESSIONAL SOCIETIES

- American Society of Biomechanics
- Orthopaedic Research Society
- American Society of Mechanical Engineers

PUBLICATIONS

1. Rovick, J.S., Reuben, J.D., Schrage, R.J., and Walker, P.S., "Relation Between Knee Motion and Ligament Length Patterns", Clin. Biomech., 6(4):213-220, 1991.
2. Reuben, J.D., Rovick, J.S., Schrage, R.J., Walker, P.S., Boland, A.L., "Three-Dimensional Motion Analysis of the Anterior Cruciate Ligament Deficient Knee Joint", American Journal of Sports Medicine, 17(4):463-471, 1989.
3. Regalbuto, M.A., Rovick, J.S., Walker, P.S., "The Forces in a Knee Brace as a Function of Hinge Design and Placement", American Journal of Sports Medicine, 17(4):535-543, 1989.
4. Rovick, J.S. and Childress, D.S., "Pendular Model of Paraplegic Swing-Through Crutch Ambulation", Journal of Rehabilitation R&D, Vol. 25, No. 4, pp. 1-16, 1988.
5. Walker, P.S., Rovick, J.S., Robertson, D.D., " The Effects of Knee Brace Hinge Design and Placement on Joint Mechanics", Journal of Biomechanics, Vol. 21, No. 11, pp. 965-974, 1988.
6. Walker, P.S., Rovick, J.S., Garg, A., Seijong, S., "Computer Graphics Looks at the Knee: Motion Monitoring to the Total Artificial Joint", SOMA, Vol. 1, No. 2, pp. 6-13, 1986.
7. Walker, P.S., Kurosawa, H., Rovick, J.S., Zimmerman, R.A., "External Knee Joint Design Based on Normal Motion", Journal of Rehabilitation R & D, Vol. 20, No. 1, pp. 9-22, 1985.

PRESENTED PAPERS

1. Rovick, J.S., "An Additive Fabricator for High-Speed Production of Artificial Limbs", Fifth International Conference on Rapid Prototyping, Dayton, OH, June 1994.
2. Rovick, J.S. and Uellendahl, J., "A Plastic Deposition Fabricator for the CAM of Sockets: Material Strengths and Clinical Experience", Twentieth Annual Meeting of the American Academy of Orthotists and Prosthetists, Nashville, TN, March 1994.
3. Chan, R.B., Rovick, J.S. and Childress, D.S., "Surface Curvature Analysis for Enhanced Computer-Aided-Design of Prosthetic Sockets", International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, CA, Vol. 15, October, 1993.
4. Rovick, J.S., "A New CAM Technique for the Direct Automated Fabrication of Sockets", Nineteenth Annual Meeting of the American Academy of Orthotists and Prosthetists, Las Vegas, NV, March -April 1993.
5. Rovick, J.S., "An Additive Fabrication Technique for the Computer-Aided Manufacturing of Sockets", Seventh World Congress of the International Society of Prosthetics and Orthotics, Chicago, Illinois, June 28 - July 3, 1992.
6. Rovick, J.S., Chan, R.B., Van Vorhis, R.L., and Childress, D.S., "Computer-Aided Manufacturing in Prosthetics", Various Possibilities Using Industrial Equipment", Seventh World Congress of the International Society of Prosthetics and Orthotics, Chicago, Illinois, June 28 -July 3, 1992.

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PRESENTED PAPERS (CONT.)

7. Rovick, J.S., "A Kinematically Determined Coordinate System for the Knee with Application to the Study of Joint Mechanics and Human Gait", Proceedings of the First World Congress of Biomechanics, Vol. I, pg. 93, San Diego, CA, August, 1990.
8. Van Vorhis, R.L., Rovick, J.S., Chan, R.B., Childress, D.S., "Statistical Improvements in Accuracy of 3-D Triangulation for Human Motion Studies: Maximum Likelihood Position Estimates From Over-Determinant Light Plane Observations", Proceedings of the First World Congress of Biomechanics, Vol. II, pg. 152, San Diego, CA, August, 1990.
9. Van Vorhis, R.L., Rovick, J.S., Childress, D.S., "Anatomically-Based Axis Definition to Facilitate Inter/Intra-Subject Data Set Comparison", Proceedings of the Int'l Symposium on Gait Analysis - State of the Art of Measuring Systems and the Importance in Orthopaedic Technology, Berlin, Germany, February 2-3, 1990.
10. Childress, D.S., Van Vorhis, R.L., Rovick, J.S., "Future Technological Directions in 'Gait Analysis' ", Proceedings of the Int'l Symposium on Gait Analysis - State of the Art of Measuring Systems and the Importance in Orthopaedic Technology, Berlin, Germany, February 2-3, 1990.
11. Rovick, J.S., Van Vorhis, R.L., "A Priori Prosthesis Alignment and CAD/CAM Production Methods", ISPO Workshop on CAD/CAM in Prosthetics and Orthotics, Seattle, WA, June, 1988.
12. Childress, D.S., Rovick, J.S., "Some Fundamental Studies: A Short Overview of CAD/CAM Investigations at Northwestern University", ISPO Workshop on CAD/CAM in Prosthetics and Orthotics, Seattle, WA, June, 1988.
13. Van Vorhis, R.L., Rovick, J.S., "Anatomically-Based Gait Analysis for Below-Knee Prosthesis Alignment -- An Experimental Method", Symposium on the Biomechanics of Normal and Prosthetic Gait, ASME Winter Annual Meeting, Boston, MA, Dec., 1987.
14. Robertson, D.D., Oravez, W.T., Zerhouni, E.A., Fishman, E.K., Rovick, J.S., Walker, P.S., "Dual-Energy CT Assessments of the Compressive Strength of Vertebral Cancellous Bone", 73rd Radiological Society of N.A., Chicago, IL, Nov., 1987.
15. Steege, J.W., Schnur, D.S., Van Vorhis, R.L., Rovick, J.S., "Finite Element Analysis as a Method of Pressure Prediction at the Below-Knee Socket Interface", Proceedings of the 10th Conf. on Rehab. Tech., San Jose, CA, June, 1987.
16. Regalbuto, M.A., Schragger, R.J., Rovick, J.S., Walker, P.S., "The Effectiveness of Knee Braces as a Function of Hinge Design and Placement", Transactions of the 33rd Meeting of the Orthopaedic Research Society, San Francisco, CA, January, 1987.
17. Rovick, J.S., Reuben, J.D., Robertson, D.D., Walker, P.S., "Control of Knee Kinematics by Ligaments", Transactions of the 33rd Meeting of the Orthopaedic Research Society, San Francisco, CA, January, 1987.
18. Rovick, J.S., Reuben, J.D., Schragger, R.J., Walker, P.S., Boland, A.L., "The Influence of the ACL on the Motion of the Knee", Proceedings of the Annual Meeting of the Am. Orthop. Soc. for Sports Med., Sun Valley, ID, pp 34-36, July, 1986.
19. Rovick, J.S., Walker, P.S., "Design of an Off-The-Shelf Knee Orthosis Using Averaging Techniques", Proceedings of the 9th Conf. on Rehab. Tech., Minneapolis, MN, June, 1986.

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PRESENTED PAPERS (CONT.)

20. Reuben, J.D., Rovick, J.S., Walker, P.S., Schragger, R.J.: Three-Dimensional Kinematics of Normal and Cruciate Deficient Knees-- A Dynamic In Vitro Experiment. Transactions of the 32nd Meeting of the Orthopaedic Research Society, New Orleans, LA, February, 1986.
21. Robertson, D.D., Walker, P.S., Rovick, J.S., Campbell, R.S., "The Effects of External Knee Joint Motion on Internal Knee Mechanics", Proceedings of the 8th Conf. on Rehab. Tech., Memphis, TN, June, 1985.
22. Rovick, J.S., Reuben, J.D., Walker, P.S., Schragger, R.J., "An Experimental Study of Knee Kinematics In Vitro", Proceedings of the 8th Conf. on Rehab. Tech., Memphis, TN, June, 1985.
23. Robertson, D.D., Rovick, J.S., Walker, P.S., "The Effect of External Motion Guidance Joints on Ligament Length Patterns in the Knee", Proceedings of the 11th Northeast Bioeng. Conf., Worcester, MA, March, 1985.
24. Rovick, J.S., Walker, P.S., Reuben, J.D., Schragger, R.J., "An Experimental Method for the Study of Knee Joint Motion In Vitro", Proceedings of the 11th Northeast Bioeng. Conf., Worcester, MA, March, 1985.
25. Robertson, D.D., Rovick, J.S., Walker, P.S., "The Potential of an External Knee Linkage for the Control of Ligament Lengths During Motion", Trans. of the 31st Meeting of the Ortho. Research Society, Las Vegas, NV, January, 1985.
26. Rovick, J.S., Walker, P.S., Zimmerman, R.A., "Design of an Orthotic Hinge Capable of Producing Normal Anatomic Motion or Near Anatomic Motion as Desired", Proceedings of the 2nd Intl. Conf. on Rehab. Eng., Ottawa, Canada, June, 1984.
27. Walker, P.S., Kurosawa, H., Rovick, J.S., Zimmerman, R.A., "The Motion of Orthotic Devices and Hinge-Distractors for the Knee Joint", Proceedings of the 2nd Intl. Conf. on Rehab. Eng., Ottawa, Canada, June, 1984.
28. Rovick, A.A., Krishnakumar, C.K., Rovick, J.S., "Factors Influencing the Fahaerus-Lindquist Effect", Physiologist, Vol. 20, No. 4, p. 81, 1977.