CURRICULUM VITAE

DAVID BURKMAN REYNOLDS

Personal Information:

Born: July 5, 1949

Marital Status: Married May 6, 1978

Dependents: Spouse, Joyce Ann
Son, Mark David, born October 8, 1979
Daughter, Allison Jean, born February 12, 1982
Daughter, Robin Karen, born July 2, 1988

Education: B.S. Mechanical Engineering
University of Virginia, Charlottesville, 1971.

Masters, Mechanical Engineering
University of Virginia, Charlottesville, 1972.

Ph.D., Biomedical Engineering
University of Virginia, Charlottesville, 1978.
Dissertation: Modeling Studies of the Pressure-Flow Relationship of the Central Airways.

Post-Doctoral in Respiratory Physiology
Mayo Clinic, Thoracic Diseases Research Unit
Rochester, Minnesota, 1978-1980.

Visiting Scholar, Reliability Workshop, 3 week intensive study at AFIT, Wright Patterson AFT, summer, 1987.

Current Position: Associate Professor of Biomedical & Human Factors Engineering, College of Engineering and Computer Science (CECS), Wright State University, Dayton, Ohio, 1988-Present.

Professional Experience: Assistant Professor of Biomedical Engineering, CECS and School of Medicine, WSU, Dayton, OH, 1982-1988.

Visiting Assistant Professor, Wright State University, Biomedical and Mechanical Engineering, 1981-82.

Research Assistant Professor, Wright State University, Biomedical Engineering, 1980-81.

Research Fellow, Mayo Clinic, Rochester, Minnesota, 1978-1980.
Teaching, Pulmonary Mechanics, Mayo Medical School, Rochester, Minnesota, 1979-1980.

Graduate Research Assistant, Research Laboratories for the Engineering Sciences, University of Virginia, Charlottesville, 1975-1977.

Summer Research Assistant, Biomedical Engineering, University of Virginia, Charlottesville, 1974.

Summer Engineering Assistant, Environmental Research Corporation, Alexandria, Virginia, 1969.

Summer Engineering Assistant, Materials Testing Laboratory, National Crushed Stone Association, Washington, D.C., 1968.

Research Interests:

Traditional interests have been in experimental, theoretical, and computer modeling of the fluid and solid mechanics of vessels in the cardiopulmonary system and their control. Experiments have dealt with the effects of branching on the pressure distribution and its variation with flow in the bronchial airways, with emphasis on an engineering approach and analysis. Data has been input to a computer model of forced expiration, developed as an aid to both clinical interpretation of pulmonary function tests and research in respiratory mechanics. Also interested in heat and mass transfer in the respiratory system and application to artificial intervention. Recent interests have been in prosthetics engineering, particularly controllable mechanisms for joints in lower limb prostheses and modeling of pneumatic muscle and its use in prosthetics, orthotics, and strength augmentation.

Undergraduate Teaching Experience:

- Biotransport and Artificial Organs. Applied course for seniors and first year graduate students. 3 hours lecture, 1 hour lab. Extensive Laboratory development, 1987-88.

- Biomaterials. Applied course covering biomaterials, stress analysis and mechanical design for seniors and first year graduate students. 3 hours lecture, 1 hour lab. Materials test instrument labs added in 1991.

- Biomedical Engineering Systems I, II. Fluid, heat and mass transfer fundamentals with application to physiological and biomedical technology systems. 3 hrs. lecture each course.

- Design and Analysis of Engineering Experiments (Applied probability and statistics).

- Biomechanics and Biofluids, 3 hours lecture.

- Bioinstrumentation I. Revised Lab Manual, Fall, 1984 3 hours lecture, 1 hour lab.

- Thermodynamics, (for M.E. Dept.), 4 hours lecture.

- Fluid Mechanics (for M.E. Dept.), 3 hours lecture, 1 hour lab.

- Heat Transfer (for M.E. Dept.), 3 hours lecture, 1 hour lab

- Biomedical Computers Lab.

- Biomedical Electronics Lab.

- Biomedical Computers Course (team-taught).
- Dynamics (for M.E. Dept.).
- Advanced Biophysics (Biomechanics).
- Statics (for M.E. Dept.).
- Engineering Biophysics.

Graduate Teaching Experience:

- Biocompatibility of Materials
- Cardiopulmonary Modeling
- Orthopaedic/Prosthetic Biomechanics
- Mathematical Modeling of Biosystems (for Biomed. Sciences Ph.D. Program).
- Presented six seminars in Respiratory Seminar course for Continuing Medical Education, Mayo Clinic, Rochester, Minnesota, 1979-80.

Departmental & Additional Academic Duties:

Assistant Chair and Program Director for Biomedical Engineering, 2002-Present.
Program Director for Biomedical Engineering, 2000-2002. Previously, advised all BME undergraduates until Fall 1986 after which have advised about one third to one fifth. Also have responsibility of assessing BME credit for transfer students. Have primary responsibility for discussions with and escorting potential students and family about Biomedical Engineering at WSU. On the national level, I attend AIMBE Academic Council meetings (our dept is a dues-paying member of this group) and meetings of the Council of Chairs of Undergraduate BME programs.

Honors Fellowships Awards

Tau Beta Pi, University of Virginia, 1971.

Graduated with distinction, University of Virginia, 1971.

Intermediate Honors, University of Virginia, 1970.

Phi Eta Sigma, University of Virginia, 1968.

University, Governor's and Newcomb Fellowship, 1971-75.

Wright State University Commendation for Biomedical Research Team, 1987.

Nominated for Teaching Effectiveness Award, 1999, 2003

References:

Dr. J.S. Lee*, retired emeritus professor
At: Division of Biomedical Engineering,
University of Virginia Medical Center, Box 377
Charlottesville, Virginia 22908
Ph: (804) 924-5101

Dr. Chandler A. Phillips
At: Wright State University
Department of Biomedical & Human Factors Engineering
207 Russ Engineering Center
Dayton, Ohio 45435
Ph: (937) 775-5067

Dr. Stephen J. Lai-Fook
At: Department of Biomedical Engineering
Wenner-Gren Research Laboratories
University of Kentucky
Lexington, KY 40506-0070
Ph: (606) 257-1379

*Dissertation Advisor

Professional Societies & Activities:

- Biomedical Engineering Society (Member)
- Sigma Xi (Member)
- American Society for Engineering Education (ASEE), (Member of Biomed. Engr. Division).
- Departmental Representative to AIMBE, 1992-present.
- Chairman, Biomedical Engineering Division of ASEE, 1992-93
- Program Chair, ASEE Annual Conf./Biomedical Engineering Division, 1991-92.
- Symposium Chairman, BMES Annual Conf., Charlottesville, VA, 1991: "BME Education for the 21st Century."
- Session Chairman, ASEE Annual Conf., Lincoln, NB, 1989: "Identification of Instructional Materials for BME."
- Chairman, Education and Public Affairs Committee of the Biomedical Engineering Society, 1984-86, 1987-88.
- Chairman, Curriculum Committee, Biomedical Engineering Division, ASEE, 1985-86.
- Session Chairman, ASEE Annual Conf., Atlanta, 1985: "Matching BME Education to the Needs of Industry."
- Session Chairman, 37th ACEMB, entitled: "Pulmonary/Respiratory Mechanics and Instrumentation," Los Angeles, September 1984.
- Presenter, 37th ACEMB, Lunch with Authorities, entitled: "Bronchial Tree Aerodynamics," Los Angeles, September 1984.
- Session Chairman/Moderator, IEEE NAECON, entitled: "Physiological/Medical Interfaces," Dayton, May 1984.
- Session Chairman, 36th ACEMB, entitled: "Biomedical Applications," Columbus, September 1983.
- Session Co-chairman at FASEB, in Biomedical Engineering Society Symposium, entitled: "High Frequency Ventilation, "Chicago, April 1983.

University & College Committees & Service:

- Member, Athletic Council, 2002-2005, 1998-2000, 1992-94, 1986-90.
- Alternate, University Due Process Committee, 1997-98.
- Member, Academic Letters Committee, 1997-98.
- Member, University Honors Committee, 1996-97.
- Member, General Education Oversight and Assessment Committee (GEOAC), 1996-
- Academic Council/Faculty Senate Rep. To Athletic Council, 1991-92, 2004-05.
- Member, University Undergraduate Curriculum and Academic Policy Committee, 1994-95.
- Member, University Student Affairs Committee, 1988-89.
- Member, Academic Council, 1990-91.
- Member, University Building and Grounds Committee, 1990-91,99-00
- Member, Scholarship Committee, CECS, 1999-00
- Chairman, Curriculum Committee, College of Engineering and Computer Science (CECS), 1986-87, 87-88, 88-89, 94-95; Member, 89-90, 90-91, 91-92, 97-98, 98-99.
- Secretary, Steering Committee, CECS, 1991-93, 1993-95, 1997-98, 1998-99.
- Member, CECS Faculty Development Committee 1993-95.
- BME Coordinator for Summer Engineering Institute, 1992-94.
- Faculty Instructor, Academic Advantage Summer Program for Incoming Engineering Students, 1995, 96, 97, 98.
- Chairman, Planning Group for the Biomedical Sciences Ph.D. Program Symposium, 1986-87.
- Member, Curriculum Committee, Biomedical Sciences Ph.D. Program, 1986-87, 91-92.
- Biomedical Engineering Track Director, BMS Ph.D. Program, 1984-present.
- Member, Biomedical Engineering Faculty Search Committee, 1984-85.
- Member, Mechanical Systems Engineering Faculty Search Committee, 1982.
- Faculty Advisor, Student Chapter of the Biomedical Engineering Society.

Community Service:

- Presenter for Biomedical Engineering, Affiliate Societies Council, Science and Engineering Weekend, Dayton Museum of Natural History, 1996.
- Presenter for Biomedical Engineering, Springfield Catholic Central High School, 1994.
- Presenter for Biomedical Engineering, Greenview High School, Jamestown, OH, 1993.
- Presenter for Biomedical Engineering, College Day, NCR Sugar Camp, 1991.
- Presenter for Biomedical Engineering, Kettering HS Career Night, 1986, 2002
- Presenter for Biomedical Engineering, Centerville HS Career Night, 2003.
- Presenter for Biomedical Engineering, Hire Hopes Career Fair. Southwestern Ohio Council for Higher Education, Dayton, 1986.
- Presenter for Biomedical Engineering, West Carrollton High School Advanced Biology class, 1985.

Undergraduate/Honors Projects Advised:

Chris Savage, “Mechanical Properties of Fascia Lata”, 1999-00. (with Anupam Bedi, graduate student)

Jayson Zadzilka, “Mechanical Design of Shock-Absorber Controlled Prosthetic Ankle”, 1999-00.

Alonzo Patterson III, “Pressure-diameter Relations of Biological Vessels,” 1985.

Terese L. Desimio, “A Comparison of the Methods Employing Pressure Waves to Determine Respiratory Parameters,” 1984.

Senior Projects in Biomedical Engineering:

C. Eichenlaub, S. Nikhat, C. Stanford, “Self Adjusting Child Car Seat Harness”, 2008-09

B. Perseghetti, G. Romigh, “Leg Extension Device”, 2008-09

M. Saraj, “Vibrating Snake”, 2008-09

D. Borrero, and M. Redha, “Vibrating Mat”, 2007-08

N. Vyas and M. Thomas, “Height Adjustable Bed”, 2007-08

S. Auld, R. Foster, “Customized Height Adjustable Table Top”, 2006-07

O. Abousoud, J. Estepp, “Adaptation of the 7-Level Communication Builder”, 2005-06

V. Mukanshimiye, A. Maloney, “Accessible Wheelchair Tray”, 2005-06

J. Bell, G. Roush, “Hand Washer for the Disabled”, 2004-05

C. Closson, E. Ervin, “Paper Collating Machine”, 2004-05

J.R. Cunningham, A. Lenger and C. Zelnio, “Head Mounted Display for the VIP Project”, 2003-04.

A. (Mandy) Allen, C.J. Lamancusa and A. Sabatini, “Deep Pressure Machine”, 2003-04.

A. Bolds and R. Ruskowski, “Multiple Stimulation Panel”, 2002-03.

C. Burneka and M. Kahle, “Height Adjustable Standing Table”, 2002-03.

A. Fournier and A. Lewis, “A Transducer for Measuring both Normal and Shear Stress”, co-advisor with P. He, 2001-02.

J. Chaney, S. Dillhoff, J. Rose, “Pediatric Adaptable Commode Chair”, 2000-01.

A. Bierce, T. Pelo, A. Renner, J. Stikeleather, “Pedestrian Child Headform”, 2000-01.

T. Webb and A. White, “Lift Bed”, 1999-00.

M. Freyhoff, T. Castillo, G. Bandry, J. Geist, “Bending Element for a Leg Impactor”, 1998-99.

J. Klosterboer, C. Platt, S. Taylor, “Automatic Can Opener”, 1998-99, Winner at Senior Design Competition, BMES Meeting, Atlanta, Oct 99

Chong Kim and Robert Short, “Automatic Jar Opener,” 1997-98

James Marous and Brian Ruhe, “Prosthetic Alignment Device” 1996-97.

Eric Day and Amy Judy, “Prosthetic Bench Alignment System,” 1996-97.

Dax Pitts, Annette Seger, Sue Seitz and Jason Shearn, “Upper Extremity Device for Brachmann-de Lange’s Syndrome Patient,” 1995-96.

Joe Katuin, Angela Slaughter, Donna Therrien, Jeanne Uy, “Prosthetic Hand with Electric Motors and Sensors,” 1995-96. This project won the Senior Design Competition at the 1996 Annual Meeting of the Biomedical Engineering Society. Co-advised by K.S. Rattan in EE.

Sharon Leibel and Stacy Ringhand, “Adjustable Mat Table, ”1994-95.

David Brown and 4 other students from EE and ME, “Actively Controlled Artificial Ankle,” 1994-95. This project also won the Senior Design Competition at the 1995 Annual Meeting of the Biomedical Engineering Society. Coadvised by K.S. Rattan (EE). Also was a Dean’s Clinic Project.

Scott Barr, Andrea Feldmann, Corrina Monett, and David Spanier, “ Modified INVACARE Wheelchair for Variable Height Adjustment,” (Dean’s Clinic Project) 1993-94.

Norma Brown and James Richardson, “Design of an Adjustable Computer Table,” 1992-93.

Moussa Bajjaly, “Rat Femur Test Fixture,” 1991-92.

Julie Skipper, “Intra-Arterial Differential Pressure Measurement System,” 1990-91.

James Gatto, “Redesign of Cam System for Rotator Cuff Therapeutic Machine,” 1990-91.

Christopher Patton, “A New Method for Locking and Unlocking the Ankle of a Foot Prosthesis,” 1989-90.

Kevin Denlinger, “Design of a Socket for a Lower Limb Prosthesis Using a Shape-Memory Plastic,” 1989-90.

Christopher B. Pruitt, “Test Apparatus for an Artificial Kidney, ”1988-89.

Jinous Vafaie, “Motorized Lift Chair for a Child with Muscular Dystrophy,” 1988-89.

Marty L. Mayse, “Testing Apparatus for an Artificial Temperature-Controlled Urethral Occlusion Device,” 1987-88.

Jeffrey T. Ryan, “Transcutaneous Energy Transmission System,” 1987-88.

D.F. Goots and W.R. Olding, “A Model of the Human Circulatory System for Laboratory Experiments, “ 1986-87.

J. Sewell, “Feasibility of Using Segmental body Impedance to Determine Body Volume,” 1986-87.

Senior Projects in Mechanical Engineering:

Mark Mayersky, “Design of a Knee Joint for Orthotic Bracing,” 1994.

Max D. Christolear, “Rotator Cuff Therapeutic Mechanism,” 1986.

Hawley P. Harmon, “Design of Hot Air Balloon,” 1984.

Ronald M. Decker, “Design of a New Automotive Braking System,” 1983.

Phillip C. Shaw, “Cooling Suit for Race Car Drivers,” 1983.

Masters Theses Directed:

Pallavi Shinde, “Modeling the Static Characteristics of Festo Pneumatic Muscle”, 2006.

Jia-Jye Lee, “Design and Simulation of a Capacitive Sensor for Simultaneously Measuring Normal and Shear Forces”, 2006.

Erica Doczy, “Human Neck Response during Vertical Impacts with Variable Weighted Helmets”, 2006

Marilyn Rice, “Characterization of MEMS for Foot Pressure Measurements” 2005.

Elizabeth Younger, “Pneumatic Muscle Instrumentation System” 2004.

Cora Ruth M.Hamlin, “Development of a Fuzzy Logic Controller for Use With Pneumatic Muscle Actuators”, 2001.

Bryan S. Jones, “Studies in Hybrid External Fixator Biomechanics Models and Analysis for Stiffness and Deflection”, 2000.

Stephen J. Balek, “Real-Time Control of a Prosthetic Ankle Using Fuzzy Logic”, 1999.

James R. Marous, “Development of a Non-Frangible Pedestrian Leg Form Impactor”, 1999.

Alfred R. Conklin II, "Modeling the Thermal Protective Properties of Fabric", 1998.

William G. Billotte, “In Vitro Characterization of a Zinc Based Bioceramic,” 1996.

Divesh D. Mahajan, “ Fuzzy Control of a Functional Electrical Stimulation System for Knee Extension Exercise,” 1996.

Chris E. Perry, “Biomechanics of Ejection Safety for Helmet-Mounted Systems, 1995.

Jeanne A. Smith, “Diffusion Through Bioceramics,” 1994.

Rina M. Thompson, “Validation of a Phase Contrast Technique for Quantification of Flow in a Model of the Carotid Artery Bifurcation,” 1992.

Mouayad S. Masri, “Regulating the Memolastic Artificial Sphincter by Means of Transcutaneous Energy Transmission, 1990.

Michael J. Allaire, “Evaluation of Memolastic Beam Artificial Urinary Sphincter,” 1990.

Daniel E.E. Hayes, “Artificial Bladder Control System,” 1986.

Bernard J. Bruns, “Pulmonary Ventilation Modeling Using Non-Linear, Multicompartment Approach,” 1985.

Ph.D. in Biomedical Sciences Program Committees:

Augustus Morris, 1984-1988, committee member.
Michael Gargas, 1985-1988, committee member.
William Albery, 1986-1988, committee member.

Ph.D. in Engineering Program Committees:

Jenna Serres, major advisor, awarded November 2008
Maria Gerschutz, committee member, awarded June 2008
Amy Sipp, co-advisor with B. Rowley, awarded June 2008
Amy Neidhard, committee member, awarded June 2003.

Other Ph.D Committees:

William Billotte, University of Dayton, committee member, awarded 2002.

Journal Publications:

Reynolds, D.B. and J.S. Lee. “Steady pressure-flow relationship for a model of the canine bronchial tree.” J. Applied Physiol: Resp. Environ. Exercise Physiol. 51: 1072-1079, 1981.

Reynolds, David B. “Steady expiratory flow-pressure relationship in a model of the human bronchial tree.” J. Biomech. Engr. 104: 153-158, 1982.

Faghri, A., D.B. Reynolds, and P. Najafi. “Heat pipes for hands.” Mechanical Engineering, 111 (6): 70-74, 1989.

Ezenwa, B., D. Reynolds, B. Rowley, “Characterization of the lower limb of quadriplegics for the design of a controller for functional electrical stimulation.” Automedica, 11, pp. 45-52, 1989.

Mahajan, D., Reynolds, D.B., Rattan, K.S., and Phillips, C.A. "A Fuzzy Logic Controller For Leg Extension Exercise in a Spinal Cord Injured Person," Intl. J. of Intelligent Control and Systems, V. 2, No. 3, 1998, p. 393-412.

Hurd, W.W., E.T. Wyckoff, D.B. Reynolds, L.S. Amesse, J.S. Gruber, and G.A. Horowitz, “Patient Rotation and Resolution of Unilateral Cornual Obstruction During Hysterosalpingography”, Obstet Gynecol. 101:1275-8, 2003.

Reynolds, D.B., D.W. Repperger, C.A. Phillips, and G. Bandry, “Modeling the Dynamic Characteristics of Pneumatic Muscle”, Annals of Biomedical Engineering, 31: 310-317, 2003.

Phillips, C.A., Repperger, D.W., Neidhard-Doll, A.T., Reynolds, D.B.: “Biomimetic Model of Skeletal Muscle Isometric Contraction: I. An Energetic Viscoelastic Model for the Skeletal Muscle Isometric Force Twitch”, Computers in Biology and Medicine, 34 (4): 307-322, 2004.

Neidhard-Doll, A.T., Phillips, C.A., Repperger, D.W., Reynolds, D.B.: Biomimetic Model of Skeletal Muscle Isometric Contraction: II. Phenomenological Model of Skeletal Muscle Excitation-Contraction Coupling Process, Computers in Biology and Medicine, 34 (4); 323-344, 2004.

Repperger, D.W., Phillips, C.A., Neidhard-Doll, A., Reynolds, D.B., and Berlin, J., “Power/energy metrics for controller evaluation of actuators similar to biological systems,” *Mechatronics*, Vol. 15, Issue 4, May 2005, pp. 459-469.

Repperger, D.W., C.A. Phillips, A.T. Neidhard-Doll, D.B. Reynolds, J.E. Berlin, “Actuator Design Using Biomimicry Methods and a Pneumatic System”, Control Engineering Practice, Vol. 14, 999-1009, 2006.

Parakkat, J., J. Pellettiere, D. Reynolds, M. Sasidharan, M. El-Zoghbi, “Quantitative Methods for Determining U.S. Air Force Crew Cushion Comfort”, SAE 2006 Transactions Journal of Aerospace, paper no. 2006-01-2339, p.540- , March 2007.

Gerschutz, M., Phillips, C., Reynolds, D., and Repperger, D., A computational simulated control system for a high-force pneumatic actuator: system definition and application as an augmented orthosis, Computer Methods in Biomechanics and Biomedical Engineering. 12(2): 173-183,2008

Serres, J.L., D.B. Reynolds, C.A. Phillips, M.J. Gerschutz and D.W. Repperger. Characterization of a Phenomenological Model for

Commercial Pneumatic Muscle Actuators. *Computers Methods in Biomechanics and Biomedical Engineering* 2008 (in press)

Serres, J.L., D.B. Reynolds, C.A. Phillips, D.B. Rogers, and D.W. Repperger. Characterization of a Pneumatic Muscle Test Station with Two Dynamic Plants in Cascade. *Computers Methods in Biomechanics and Biomedical Engineering* 2008 (accepted pending revisions)

Serres, J.L., C.A. Phillips, D.B. Reynolds, S.R. Mohler, D.B. Rogers, D.W. Repperger and M.J. Gerschutz. Lower Extremity Resistive Exercise Device Utilizing an Antagonistic Pneumatic Muscle Actuator. Submitted to *Aviation, Space and Environmental Medicine*

Archival Abstracts:

Reynolds, D.B. and J.S. Lee, "Modeling study of the pressure-flow Relationship of the bronchial tree," Fed. Proc. 38:1444, 1979.

Reynolds, D.B. "Dimensional analysis correlates expiratory flow of several gases with static pressure drop across a cast of the human bronchial tree." The Physiologist 23: 4:165, 1980.

Reynolds, David B. "Flow and gas property dependence of central airway resistance in excised human lungs." Fed. Proc. 40:596, 1981.

Reynolds, D.B. "Modeling the pressure-flow relation of bifurcating networks." In Biofluid Mechanics, Vol. 2, Ed. D.J. Schneck, Plenum Press, New York, 1980, p. 57-75.

Reynolds, D.B., J.S. Petrofsky, and R.M. Glaser. "Inter-relationships among power output, pedal frequency oxygen uptake, and heart rate during bicycle ergometer exercise." The Physiologist 24: (4), 1981, p.64.

Reynolds, D.B., M.J. Allaire and D.E.E. Hayes, "Initial experience with a shape-memory artificial sphincter," (Abstract) Ann. Biomed. Engr, 19(5); p. 648, 1991.

D.B. Reynolds, K.S. Rattan, C.A. Phillips. "Fuzzy control of an electrical muscle stimulation/reciprocation gait orthosis for spinal cord injured," (Abstract) Ann. Biomed. Egr. 21 (Supp. 1); p.69, 1993.

D.B. Reynolds, "Modifying the ATB model to simulate motion in water" (Abstract) Ann. Biomed. Egr. 22 (Supp. 1), 1994.

Mahajan, D.D., D.B. Reynolds, K.S. Rattan, C.A. Phillips, "Fuzzy control of a functional electrical stimulation (FES) system for knee extension exercise," Ann. Biomed. Engr. V 24 (Suppl), 1996, p.570.

Marous, J. and Reynolds, D.B. "A Non-frangible Pedestrian Legform Impactor", Annals of Biomedical Engineering, Vol. 26, Supplement 1, p.s-116, OE.66 (Abstract), 1998.

Repperger, D.W., C.A. Phillips, D.B. Reynolds, and G.E. Bandry, “A Tool for Synthesis of Biodynamic Motion”, Aviation, Space, and Environ. Med. 73(3):263, Abstract 206, 2002.

Phillips, C.A., D.W. Repperger, D.B. Reynolds, and G.E. Bandry, “Posture Control Strategy for Enhanced Human Performance Exoskeletons”, Aviation, Space, and Environ. Med. 73(3):296, Abstract 369, 2002.

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Phillips, C.A., D. W. Repperger, R. Kinsler, D. Reynolds, and M. Coggins, “A Study of Information Overload in a Complex Performance Task”, Aviation, Space, and Environmental Medicine, Vol. 74, No. 4, April, 2003, pp. 384.

Phillips, C.A., D. W. Repperger, R. Kinsler, and D. Reynolds, “Analysis of Ergonomic Workload Using Physiological State Models”, Aviation, Space, and Environ. Med., Vol. 74, No. 4, April, 2003, pp. 405.

Khan, M., Urooj, S., R. O’Hara, R.L. Pohlman, D.B. Reynolds, A Microprocessor for Non-invasive measurement of high-altitude pulmonary edema**,** Aviation, Space, and Environmental Medicine, Vol. 79, April, 2007, pp.

Phillips, C.A., M.J. Gerschutz, D.B. Reynolds, D.W. Repperger, J.L. Serres, and S.R. Mohler. Dynamic Control Modeling of an Antagonist Pneumatic Muscle when Performing a Simulated Knee Extension Task. Aviation, Space and Environmental Medicine 2008: 79 (3), [117], 235.

Khan, M., R.B. O’Hara, D.B. Reynolds, A.K. Salhan, and R.L. Pohlman. Assessment of Gravitational Blood Pooling in Legs of Human Volunteers Using Non-Invasive Technique. *Aviation, Space and Environmental Medicine* 2008: 79 (3), [470], 235.

Phillips, C.A., J.L. Serres, D.B. Reynolds, S.R. Mohler, D.B. Rogers, D.W. Repperger, M.J. Gerschutz, and K.L. Muckley. An Antagonist Pneumatic Muscle and Dynamic Test Station Simulating Human Performance of Knee Extension Task. *Ohio Academy of Science,* April 2009.

Full Conference papers:

Reynolds, David B., Roger M. Glaser and Jen-shih Lee. “Steady and unsteady pressure-flow relations in bronchial tree models.” IEEE NAECON Proc. 1981, p. 1071-1078.

Reynolds, David B., J.S. Petrofsky, and R.M. Glaser. “Digital speedometer and crank position indicator for the Monark bicycle ergometer.” IEEE NAECON Proc. 1982, p. 194-196.

Hendershot, D.M., J.S. Petrofsky, D.B. Reynolds, and R.M. Glaser. “A comparison of the cardiovascular responses to isometric exercise of three different sized muscle groups.” IEEE NAECON Proc. 1982, p.457-463.

Reynolds, D.B., C.A. Phillips, J.S. Petrofsky, H.H. Heaton and D.M. Hendershot: "Cardiovascular responses during systematic variation of headgear loading parameters," IEEE NAECON Proc. 83: 1200-1209, 1983.

Swiatek, J. and D.B. Reynolds. "Two-stage approach to the modeling of the influence of the drugs and environmental factors on the respiratory system." Proc. 3rd Intl. Conf. Sys. Engr. Dayton, OH 1984, p. 209-212.

Reynolds, D.B. and B.J. Bruns. "Estimating the small airways resistance from measurements of the upstream resistance of several gas mixtures." IEEE NAECON Proc., 1985, p.992-993.

Reynolds, D.B. and C.A. Phillips. "Steady inspiratory pressure-flow relationship in human bronchial tree model." In Biomedical Engineering II: Recent Developments, Ed. C.W. Hall, Pergamon, Proc. Second Southern Biomed. Engrg. Conf., 1983, p. 157-160.

Reynolds, D.B. and B.A. Rowley. "Undergraduate degree in biomedical engineering: The Wright qpproach to employability." ASEE Ann. Conf. Proc., 1985, p. 992-993.

Reynolds, D.B. and B.J. Bruns. "Computer simulation of pulmonary ventilation." IEEE NAECON Proc., Dayton, OH, 1986, p. 768-773.

Ezenwa, B., D.B. Reynolds, B.A. Rowley, and P.T. Danset, "Characterization of the lower limb of quadriplegics for the design of a controller for functional electrical stimulation." Proc. Fifth Int. Conf. Systems Engr., Dayton, OH, 1987, p.533-8.

Christolear, M.D., and D.B. Reynolds. "Design and development of the rotator cuff therapeutic mechanism." IEEE EMBS 10th Ann. Intl. Conf. Proc., New Orleans, LA, 1988, p. 1643-44.

Christolear, M.D., and D.B. Reynolds. "A rotator cuff exercise device." 3rd Joint ASCE/ASME Mech. Conf., ASME Pub. AMD-Vol. 98, 1989, p. 389-91.

Allaire, M.J., D.B. Reynolds and P.K. Bajpai. "Electrical properties of ALCAP and ZCAP ceramics." 26th Rocky Mtn. Bioengineering Conference, Ames, Iowa, 1989.

Allaire, M.J. and D.B. Reynolds, "Test apparatus and methods for performance evaluation of an artificial urinary sphincter," in Biomedical Sciences Instrumentation, Proc. 28th Ann. Rocky Mtn. Bioengrg. Symposium, 1991, p. 263-72.

Reynolds, D.B., and P. He, "Introducing students to the engineering design experience," ASEE Ann. Conf. Proc., p. 277-9, 1991.

Snead D., P. Barre, P.K. Bajpai, A. Taylor, D. Reynolds, B. Mehling, A. Longo, and D. Nolan, "The use of a zinc based bioceramic as an osteoconductive agent in the rat model," 34nd Ann. Rocky Mtn. Bioeng. Symp., in Biomed. Sci. Instrument, v. 31, p. 141-6, 1995.

Billotte, W.G., G.M. Mehrotra, D.B. Reynolds, and P.K. Bajpai, "Preparation and characterization of ZCAP Blends," 32nd Ann. Rocky Mtn. Bioeng. Symp., in Biomed. Sci. Instrument, V. 31, p. 153-8, 1995.

Smith, J.A., D.B. Reynolds, P.K. Bajpai, and R. Sedaghat, "Feasibility of determining diffusion characteristics of bioceramics using gamma scintigraphy," Proc. 15th Annual Southern Biomedical Engineering Conference, 1996, p.231-4.

Collins, R., Paul, Z., Reynolds, D.B., Short, R. F. and Wasuwanich, S. "Controlled Diffusional Release of Dispersed Solute Drugs from Biodegradable Implants of Various Geometries", Biomed. Sci. Instrument., V.33, 1997, p.137-42.

Billotte, W.G., Reynolds, D.B., Mehrotra, G.M., Srinivasan, R., and Bajpai, P.K. "In Vitro Characterization of a Fine Based Bioceramic" Biomed. Sci. instrument., V.33, 1997, p. 126-30.

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Short Conference Papers and Abstracts:

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Kelly, Kevin A. and David B. Reynolds. "Automotive compressor performance test stand." Proc. Undergrad. Sci. Symp. Central State University, Wilberforce, Ohio, 1982.

Reynolds, D.B., B.J. Bruns, and I. Kaleps. "Cardiopulmonary modeling of acceleration effects." Proc. 38th Ann. Conf. Engr. Egr. Med. Biol., Chicago, IL, 1985, p.323.

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Billotte, W.G., R. Srinivasan, G.M. Mehrotra, D.B. Reynolds, and P.K. Bajpai, "Porosity Measurements of ZCAP by quantitative image analysis," Fifth World Biomaterials Congress, 1996, Toronto.

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Repperger, D.W., and D. B. Reynolds "A Friction-Meter Concept Utilizing Wireless MEMS", 27th Annual Dayton-Cincinnati Aerospace Science Symposium of AIAA.

Repperger, D.W., S.R. Soni, and D.B. Reynolds, "Wireless MEMS Tested within the Context of a transparent Sensor, 44th Ann. Midwest Symp. On Circuits and Systems, Dayton OH, Aug 2001.

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Siebuhr K, P. He, D. B. Reynolds D, B. Booth, J. Bell, M. Wimmers, R.T. Laughlin, “CT Analysis of Tibiofibular Stability in Below Knee Amputation with and without Transosseous Fusion under Loaded Conditions”. Miami Valley Hospital Department of Medical Education, Clinical Research Center Resident Research Paper Award, Dayton, OH, May 2006. Second Place.

Ankesh Thakur[a], Charles Cheng, David B. Reynolds, Joseph Pellettiere, Julia Parakkat, Scott Fleming, Quantitative Methods for Evaluating Comfort in Static and Active Cushions in Ejection Seats**,** BioOhio Conference, Columbus, Ohio, September, 2006.

Allison Gadd and David Reynolds, Comparing a Model for Pneumatic Muscle with the AV Hill Model for Skeletal Muscle, BioOhio Conference, Columbus, Ohio, September, 2006.

Serres, J. L., D. B. Reynolds, and C. A. Phillips. A Test Apparatus for the Characterization of a Festo Pneumatic Muscle Actuator. Dayton Engineering Science Symposium. Wright State University, Dayton, Ohio, October 29, 2007.

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Gadd, A., D.B. Reynolds, C.A. Phillips. Biomimetic Characteristics of Pneumatic Muscle. 3rd Annual Dayton Engineering Sciences Symposium. Wright State University, Dayton, Ohio, October 29, 2007.

Gerschutz, M., C. A. Phillips, D.B. Reynolds. Application of an Adaptive Simulated Control System for Industrial Pneumatic Muscle Actuators. 3rd Annual Dayton Engineering Sciences Symposium. Wright State University, Dayton, Ohio, October 29, 2007.

Klingbeil, N.W., Mercer, R.E., Rattan, K.S., Raymer M.L. and Reynolds, D.B., "Engineering Mathematics Education at Wright State University: A Model for Increasing Student Success in Engineering," Dayton Engineering Sciences Symposium, October, 2007.

Klingbeil, N.W., Mercer, R.E., Rattan, K.S., Raymer M.L. and Reynolds, D.B.,"The Wright State Model for Engineering Mathematics Education: Uncorking the First-Year Bottleneck," A Dialogue on Engineering

Education II: The Role of the First Year, ASEE First Year Engineering Workshop, Notre Dame, IN, July 2007.

Klingbeil, N.W., Mercer, R.E., Rattan, K.S., Raymer M.L. and Reynolds, D.B., "A National Model for Engineering Mathematics Education," ASEE Southeastern Section Conference, Louisville, KY, April 2007.

Klingbeil, N.W., Mercer, R.E., Rattan, K.S., Raymer M.L. and Reynolds, D.B., "Engineering Mathematics Education at Wright State University: Uncorking the First-Year Bottleneck," 26th Annual Conference on the First-Year Experience, National Resource Center for the First-Year Experience & Students in Transition, Addison, TX, February 2007.

Other Publications/Technical Reports:

Reynolds, D.B. "Undergraduate biomedical engineering education. Letters to the Ed." Biomedical Engineering Society Bulletin, VII, No. 4, November 1983, p.9-11.

J. Parakkat, J. Pellettiere, D. Reynolds, Seat Cushion Design on Physical Fatigue and Cognitive Performance," Air Force Research Laboratory Report No. AFRL-HE-WP-TR-2006-0163, Wright-Patterson Air Force Base OH, February 2007.

Patents:

Robust, Wireless Microelectromechanical System (MEMS) Shear Force Sensor, with D.W. Repperger and J. Berlin, US Pat. No. 6,736,015, May 18, 2004.

Research Awards, Grants & Contracts:

Research Incentive Grant, Wright State University, 1983-84, $1,250.

Summer faculty Research Fellow, AFOSR, 1984, Wright-Patterson AFB. Research Initiation in Science and Engineering, AFOSR Project entitled, "A Computational Model of the Cardiopulmonary System".1984-85, $17,977.

Biomedical Science Research Grant, "Artificial Bladder Control Sphincter," Wright State University School of Medicine, 1986, $2,000.

"Artificial Bladder Control Sphincter", B.F. Goodrich, Akron, OH 1986, $8,000 for Phase I; $60,000 for Phase II, 1987-89.

"Artificial Bladder Control Sphincter," Ohio Edison Program, $50,000, Feb. 1990-March 1991.

President's Club Grant, WSU, "Rotator Cuff Therapeutic Mechanism," 1988-89, $4,966.

Research Incentive and Research Development Award, WSU, "Rotator Cuff Therapeutic Mechanism," 1987-88, $1,600.

"An Intermittent Oxygen Delivery System," Hugh W. Payton, M.D., Inc., 1987. $4,971 (funded in part).

Summer Research Program, AFOSR, Wright Patterson AFB, Armstrong Laboratory, Crew Systems Directorate, Vulnerability Branch, 1992.

AFOSR Research Initiation Program, “Simulation of the Motion of Single and Linked Ellipsoids Representing Human Body Segments on a Free Fluid Surface,” December 1992-December 1993, $20,000.

Ohio’s Research Challenge, “Fuzzy Logic Control of Lower Limb Orthosis,” 1994-95, $2,247.

R.S. Bachtell, "X-ray Studies of the Middle Phalangeal Bones of the Hand," 1996, $13,288.

Summer Research Program, AFOSR, WPAFB, Armstrong Laboratory, Crew Systems Directorate, 1997.

“Non-Frangible Pedestrian Leg Form Impactor”, US Dept. of Transportation, $37,536, 1997-8.

"Bioengineering Design Projects for the Disabled", Co-Investigator with C. Phillips, NSF, $83,000, 1994-99, 1999-present.

"REU Supplement to Bioengineering Design Projects for the Disabled", Co-Investigator with C. Phillips, NSF, $10,000, 1998-99.

"Simulation of Thermal Injury", DynCorp, $14,910, 1998-99.

“Human Safety Criteria During Thermal Exposure to Aircraft Exhaust Gases”, Dyncorp, $20250, 1999.

National Research Council/AFOSR Summer Faculty Research Fellow, AFRL, Human Effectiveness Division, 2000, 2001, 2002.

“A National Model for Engineering Mathematics Education”, Co-Investigator with N. Klingbeil and K. Rattan, NSF, $100,000, 9/15/03-8/31/04.

“Evaluation of Cushion Comfort for Air Force Crew Stations”, with S. Narayanan, General Dynamics-Advanced Information Systems, $29,959, 10/19/2004-08/18/2005.

“Biomedical, Industrial, and Human Factors Engineering Projects for Persons with Disabilities” Co-I with Chandler A. Phillips, PI, $32,308, 01/01/05-12/31/07.

“A Biomechanical Study of the Modified Ertl BKA using Finite Element Model”, with R. Laughlin, P. He, WSU Research Incentive, $9760, 04/01/2005-06/30/2006.

“Effects of Physical Fatigue on Cognitive Ability and Performance”, $45,727, General Dynamics-Advanced Information Systems, 01/03/2006-09/03/2006.

"Evaluation of Cushion Comfort for Air Force Crew Stations", with S. Narayanan, General Dynamics-Advanced Information Systems, $32,288, 01/03/2006-12/31/2006.

"A National Model for Engineering Mathematics Education", Co-I with N. Klingbeil, PI, NSF, $500,000, 08/15/06-07/31/09.

"Evaluation of Micro-Compression Socks in Deep Vein Thrombosis Prevention for Air Force Crew Stations, General Dynamics-Advanced Information Systems, $36,000, 06/01/07-11/30/07.

Research Teaching Equipment Grants:

Biomaterials Testing Laboratory, "NSF, 1988-90, $36,472, with matching funds from WSU.

Automated Pulmonary Function Laboratory Model M100 from Spectromed Inc. (formerly Gould Medical), Dayton, OH. Declared value: $8,500.

Kidney Dialysis System from Miami Valley Hospital, Dayton, OH.

Hollow Fiber Artificial Kidneys from CD Medical, Inc., Miami, Florida.

Consulting:

D. Roach, Attorney case involving person slipping on ice, 1985-86.

PSM, Inc., Dayton, OH. On project entitled: "An Innovative Method for Hand Protection from Extreme Cold Using Heat Pipe Technology," 1986.

Hugh W. Payton, M.D., Inc., on project entitled: "An Intermittent Oxygen Delivery System," 1988.

DynCorp, Inc. on project related to Joint Strike Fighter (JSF), 1999-00.

For Dr. Chandler A. Phillips on a case concerning rotator cuff injury and biomechanics.

last updated: 04/2009