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EDUCATION

Ph.D., Mechanical Engineering, **1998**

North Carolina State University, Raleigh, NC

Dissertation: *Transient Particle-Hemodynamics Simulations in Three-dimensional Carotid Artery Bifurcations*

M.S., Mechanical Engineering, **1988**, **Kyungpook National University**, Taegu, Korea

B.S., Mechanical Engineering, **1986**, **Kyungpook National University**, Taegu, Korea

PROFESSIONAL EXPERIENCE

Assistant Professor, 1/2003 – present

Department of Biomedical Engineering, Mercer University, Macon, GA

- Non-Newtonian viscosity modeling for concentrated suspensions of deformable elastic particles such as red blood cells in plasma using drift flux
- Computational Hemodynamics-Arterial Wall Interaction Simulation and Analysis
- Computational Hemodynamics, Wall Mechanics, and LDL and Oxygen Transfer in Arterial Systems

Research Assistant Professor, 7/2000 – 12/2002

Dept. of MAE, North Carolina State University, Raleigh, NC

Research Associate (Post Doc.), 1/1999 – 6/2000

Dept. of MAE, North Carolina State University, Raleigh, NC

Research Assistant, 8/94 – 12/1998

Dept. of MAE, North Carolina State University, Raleigh, NC

Research Engineer, 2/88 - 8/1994

Agency of Defense Development, Taejon, Korea

PROFESSIONAL SOCIETY

American Society of Mechanical Engineers, 1994 – present

American Society of Engineering Education, 2003 – present

PUBLICATIONS (Co-author)

Book Publication

- Hyun, S., “*Solution Manual for Two-Phase Flow Theory and Application*,” Taylor & Francis, **2003**.

Journal Papers

- Hyun, S., Kleinstreuer, C., and Archie, J.P. Jr., “Computer simulation and geometric design of endarterectomized carotid artery bifurcations,” *Critical Reviews in Biomedical Engineering*, **Vol. 26, No. 5 & 6**, p. 303, **1998**.

- Comer, J.K., Kleinstreuer, C., Hyun, S., and Kim, C.S., “Aerosol transport and deposition in sequentially bifurcating airways,” *Journal of Biomechanical Engineering* , **Vol. 122, April**, pp. 152-158, **2000**.
- Hyun, S., Kleinstreuer, C., and Archie, J.P. Jr., “Hemodynamics analyses of arterial expansions with implications to thrombosis and restenosis,” *Medical Engineering & Physics*, **Vol. 22**, pp. 13-27, **2000**.
- Hyun, S., Kleinstreuer, C., and Archie, J.P. Jr., “Computer simulation and geometric design of endarterectomized carotid artery bifurcations,” *Critical Reviews in Biomedical Engineering*, **Vol. 28, No. 1-3**, pp. 53-59, **2000**.
- Hyun, S. and Kleinstreuer, C., “Numerical simulation of mixed convection heat and mass transfer in a human inhalation test chamber,” *International Journal of Heat & Mass Transfer*, **Vol. 44, No. 12**, pp. 2247-2260, **2001**.
- Kleinstreuer, C., Hyun, S., Buchanan, J.R., Longest, P.W., Archie, J.P. Jr., and Truskey, G.A., “Hemodynamic parameters and early intimal thickening in branching blood vessels,” *Critical Reviews in Biomedical Engineering*, **Vol. 29, No. 1**, pp. 1-64, **2001**.
- Hyun, S., Kleinstreuer, C., and Archie, J.P. Jr., “Computational particle-hemodynamics analysis and geometric reconstruction after carotid endarterectomy,” *Computers in Biology and Medicine*, **Vol. 31**, pp. 365-384, **2001**.
- Loh, B., Hyun, S., Ro, P and Kleinstreuer, C, “Acoustic streaming induced by ultrasonic flexural vibrations and associated enhancement of convective heat transfer,” *The Journal of the Acoustical Society of America* **Vol. 111, No. 2**, pp. 875-883, **2002**.
- Hyun, S. and Kleinstreuer, “Computational analysis of a human inhalation test chamber for dosimetry-and-health-effect studies,” *Applied Occupational and Environmental Hygiene* **Vol. 17, No. 8**, pp. 561-572, **2002**.
- Hyun, S., Kleinstreuer, C., and Archie, J.P. Jr., “Computational analysis of the effects of external carotid artery flow and occlusion on adverse carotid bifurcation hemodynamics,” *Journal of Vascular Surgery* **Vol. 37, No. 6**, pp. 1248-1254, **2003**.
- Buchanan, J.R., Kleinstreuer, C., Hyun, S., and Truskey, G.A., “Hemodynamics simulation and identification of susceptible sites of atherosclerotic lesion formation in a model abdominal aorta,” *Journal of Biomechanics* **Vol. 36**, pp. 1185-1196, **2003**.
- Hyun, S., Kleinstreuer, C., and Longest, P.W., “Particle-hemodynamics simulations and design options for surgical reconstruction of diseased carotid artery bifurcations,” *ASME Journal of Biomedical Engineering*, **2003, (accepted)**.

Book Chapters

- Kleinstreuer, C., and Hyun, S., “Computer simulation of dilute suspension flows in branching blood vessels,” in *Medical Applications of Computer Modeling: Cardiovascular and Ocular Systems*, ed. T.B. Martonen, WIT Press, UK, pp. 101-168, 2000.
- Kleinstreuer, C., Hyun, S., & Archie, J.P., “Computer-aided design and optimal surgical reconstruction of the carotid artery bifurcation,” in *Medical Applications of Computer Modeling: Cardiovascular and Ocular Systems*, ed. T.B. Martonen, WIT Press, UK, pp. 169-224, 2000.

Conference Papers

- Hyun, S., Kleinstreuer, C., and Archie, J. P. Jr., (1997) Transient hemodynamics analyses in sudden expansions with implications to thrombosis, embolization and restenosis, *FED SM97 Conference Proceedings*, R. Gerbsch & D.F. Elger (eds.) ASME, New York, USA.
- Hyun, S., Kleinstreuer, C., and Archie, J. P. Jr., (1997) Transient particle-hemodynamics in partially occluded sudden expansion tubes, *CFX International User Conference '97*, AEA Tech., USA.
- Hyun, S., Kleinstreuer, C., and Archie, J. P. Jr., (1998) Particle-hemodynamics simulations and design recommendations for model carotid artery bifurcations, *13th U.S. National Congress of Applied Mechanics* in Gainesville, FL, USA.
- Hyun, S., Kleinstreuer, C., and Archie, J. P. Jr., (1998) Transient particle-hemodynamics simulations in three-dimensional carotid artery bifurcations, *Engineering Solution '98 – CFX User Conference* in Claymont, DE, USA.
- Hyun, S., Kleinstreuer, C., and Archie, J. P. Jr., (1999) Computer simulation and geometric design of endarterectomized carotid artery bifurcations, *18th Southern Biomedical Engineering Conference and the 2nd International Conference on Ethical Issues in Biomedical Engineering*, Clemson, SC, USA.
- Buchanan, J. R. Jr., Hyun, S., Kleinstreuer, C., and Truskey, G. A., (1999) Local monocyte deposition patterns and elevated permeabilities in the rabbit abdominal aorta, *Biomedical Engineering Annual Meeting, Big Sky*, Montana, USA.
- C. Kleinstreuer, S. Hyun, P.W. Longest and J.P. Archie, Jr., (1999) Virtual prototyping of branching blood vessels, *The 1st Joint Meeting of BMES and EMBS*, Atlanta, GA, USA
- C. Kleinstreuer, S. Hyun, J.K. Comer, and J.S. Kinsey, (1999) Modeling of trace gas pollutants in human inhalation test chambers, *Air Pollution IV*, eds. Brebbia, C.A., Jacobson, M., and Power, H., WIT Press, Southampton, UK., pp. 541-550
- S. Hyun and C. Kleinstreuer, (2000) Computational exposure and dose assessment analyses for transient turbulent flow and gaseous pollutant transport, *Roomvent 2000 Conference Proceedings* (Reading, UK), ed. Awbi, H. B., Elsevier Science Ltd., pp. 119-124.
- S. Hyun, A. A. Mims, S. S. Neelakantan, and C. Kleinstreuer, (2003) A hematocrit-dependent blood viscosity model, *BMES 2003 Annual Fall Meeting* (Nashville, TN).
- P.W. Longest, C. Kleinstreuer, and S. Hyun, (2003) Computational analysis of WSS conditions and critical blood particle localization in a human carotid artery bifurcation, *2003 ASME International Mechanical Engineering Congress* (Washington D.C.).

TEACHING EXPERIENCES

Mechanical Engineering: Thermodynamics, Fluid Mechanics, Heat Transfer

Biomedical Engineering: Transport Phenomena in Biological Systems, Dynamics of Biofluids, Advanced Biofluid Dynamics

HONORS

CRAY Research Fellowship (01/1995-12/1998)

The Korean Honor Scholarship (1998) from Korean Embassy in U.S.A.