

**CURRICULUM VITAE**

**Mette Olufsen, PhD**  
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**PERSONAL STATEMENT**

I am an applied mathematician with a long-standing interest and expertise in modeling to understand how disease states impact cardiovascular dynamics and autonomic control systems. During my PhD study, I was a founding member of a small start-up company (Math-Tech, Denmark) that developed one of the first model-based anesthesia simulators (SIMA), where my role was to generate the underlying cardiovascular model. To obtain a fast and accurate model, in collaboration with Prof. Charles Peskin at the Courant Institute, NYU, I formulated a structured tree model that enabled the coupling of large and small vessels in fluid dynamics vascular networks and developed dynamical systems models to study the CV control system. Results were published in *Annals Biomedical Engineering* and *American Journal of Physiology* have been cited nearly 1,500 times. An EU Framework program on high-performance computing funded the SIMA project, and the simulator and its underlying models were published in a SIAM book in 2004. I continued my studies as a postdoctoral fellow at Boston University. Here I started my work on the autonomic control system with Dr. Lewis Lipsitz at Harvard Medical School and with Prof. Nancy Kopell, with whom I worked on a neural network model to understand hippocampal functions. Since then, I have focused on developing animal and human models to assist clinicians in better understanding mechanisms underlying physiological responses in the CV system. My specific focus is on combining imaging, fluid dynamics, and dynamical systems models with sensitivity analysis and parameter inference. Most recently, to study lesion removal during pulmonary balloon-angioplasty in patients with Chronic Thromboembolic Pulmonary Hypertension, explain emerging oscillations observed for patients with postural tachycardia, and analyze CV recovery in heart transplant patients. In addition, my group has developed a model explaining how inflammation impacts CV markers, including heart rate and blood pressure. The latter is important as heart rate and blood pressure can be monitored continuously and therefore have the potential to identify markers that can help early detection of sepsis.

To sustain my work, I have continuously secured research and training funding from various federal agencies (NSF, NIH, and NSA). I was instrumental in securing an NSF-RTG grant as co-PI, and last year I was the lead PI for an NSF/NSA REU grant integrating statistics and mathematics. I have trained students and postdoctoral fellows with successful careers in academia and industry. Topping this list are Daniella Valdez Jasso (Assistant Professor at UCSD), Adam Mahdi (Lecturer at University Oxford, UK), and Mikiyo Aoi (Assistant Professor at UCSD). In the industrial setting, April Allston Purnell (Analytical Consultant at SAS) and Payton Woodall (Programming manager at Nuventra) have successfully led research and analytical groups. Students with careers dedicated to teaching include Laura Ellwein-Fix (Associate Professor at VCU), Nakeya Williams (Assistant Professor at the US Merchant Marine Academy), and Megan Chambers (Lecturer at the Virginia Military Institute). Nearly all my trainees published their results in respectable journals, and several have obtained graduate (NSF-GRFP, AHA, GEM) and postdoctoral (AHA, NIH) fellowships, and this year Dr. Valdez Jasso was awarded an NSF Career award. Importantly, I am dedicated to diversity – more than half of my current and past trainees are female, 25% have minority backgrounds, and 35% are first in their family to receive post high school education. I am dedicated to continuing this level of research and training and am looking forward to extending my work to bridge applied mathematics to improve functional applications in the clinic that help doctors and patients.

**EDUCATION**

- 1993 MSc Mathematics and Computer Science, Roskilde University, Denmark.  
Thesis: *DISCO - Discrete and COntinuous Simulation in Turbo Pascal.*
- 1994-1998 PhD Applied Mathematics, Roskilde University, Denmark.  
Thesis: *Modeling the Arterial System with Reference to an Anesthesia Simulator.*
- 1998-2001 Postdoc Center for BioDynamics and Dept of Mathematics, Boston University, Boston, MA.

**PROFESSIONAL APPOINTMENTS**

- 1994-1998 Industrial Researcher, Math-Tech, Copenhagen, Denmark.
- 1994-1998 Research Assistant, Department of Mathematics, Roskilde University.
- 1998-2001 Postdoc, Center for BioDynamics and Dept of Mathematics, Boston University, Boston, MA.
- 2001-2006 Assistant Professor, Department of Mathematics, NC State University, Raleigh, NC.
- 2007-2013 Associate Professor, Department of Mathematics, NC State University, Raleigh, NC.
- 2013- Professor, Department of Mathematics, NC State University, Raleigh, NC.
- 2020- Director, Program Directed Research for Undergraduates in Math and Statistics

**OTHER PROFESSIONAL AFFILIATIONS AND VISITING APPOINTMENTS**

- 1994 (fall) Visiting Research Assistant, Courant Institute of Mathematical Sciences, New York University, NY.
- 1996 (spring) Visiting Researcher, School of Mathematics, Australian Defense Force Academy, University of New South Wales, Canberra, Australia.
- 1996 (fall) Visiting Research Assistant, Courant Institute of Mathematical Sciences, New York University, NY.
- 2001- Associate Faculty, Biomath Program, NC State University, Raleigh, NC.
- 2002- Associate Faculty, Department of Biomedical Engineering, NC State University, Raleigh, NC.
- 2009-2010 Visiting Professor, Department of Science Systems and Models, Roskilde University, Denmark.

**ACHIEVEMENTS AND AWARDS**

1. Google scholar index: Citations 4867, h-index 28, i10-index 53.
2. Director of the NCSU DRUMS REU summer research program funded by the NSF and NSA since 2020.
3. Co-PI NCSU-RTG in Mathematical Biology, 2013-2020.
4. Secured more than \$5.0 million in research and workforce funding.
5. Developed flipped calculus course for non-majors 2015-2017.
6. Elected SAC committee Mathematical Biosciences Institute (MBI) 2014-2017.
7. IEEE TBME featured article: <http://tbme.embs.org/category/featured-articles/> (Paper by Matzuka, Mehlsen, Tran, Olufsen see details below).
8. Elected program director for SIAM Life Sciences for 2011-2012. Organized SIAM Life Sciences 2012 & 2014.
9. Thank a teacher award (2018-2020).
10. Outstanding Early Career Speaker, Redraider Minisymposium. *Mathematical and computational modeling of biological systems*, Texas Tech University, Nov 6-8, 2003.
11. Traveling Fellowship for Mathematicians, a Danish fellowship covering all expenses for one year of studies abroad, 1995-1996.
12. Danish Academy of Technical Science Fellowship (EF# 501), 1994-1998.

**PROFESSIONAL SOCIETIES**

1. Society of Industrial and Applied Mathematics (SIAM)
2. Society of Mathematical Biology (SMB)
3. IEEE (EMBS)
4. Danish Mathematical Society (DMF)
5. European Mathematical Society (EMS)

**PUBLICATIONS****Peer reviewed journal articles****2022**

1. JR Geddes, JT Ottesen, J Mehlsen, MS Olufsen. *Postural Orthostatic Tachycardia Syndrom (POTS) explained using a baroreflex model*. Royal Society Interface. Preprint arXiv:2109.14558 [q-bio.TO], 2022 (Revised version submitted).
2. BLA Gavina, AA de los Reyes, **MS Olufsen**, S Lenhart, JT Ottesen. Towards an optimal contraception dosing strategy, 2022 (Submitted PLoS Comp Biol).
3. MA Haider, KJ Pearce, NC Chesler, NA Hill, **MS Olufsen**. Application and reduction of a nonlinear hyperelastic wall model capturing ex-vivo relationships between fluid pressure, area, and wall thickness in normal and hypertensive murine left pulmonary arteries for Biomech Model Mechanobiol, Submitted Feb 2022. Preprint arXiv: 2202.12711v1 [q-bio.TO], 2022.
4. MA Bartolo, MU Qureshi, MJ Colebank, NC Chesler, **MS Olufsen**. *Numerical predictions of capillary shear stress and cyclic stretch during group II pulmonary hypertension*, for Biomech Model Mechanobiol. 21:363-381, 2022.

**2021**

5. AL Colunga\*, MJ Colebank\*, M King, C Schell, M Shelden, **MS Olufsen**. *Parameter inference in a computational model of hemodynamics in pulmonary hypertension*, for Am J Physiology (\*contributed equally). Preprint arXiv:2101.06266 [q-bio.QM], 2021 (in Review).
6. K Talaei, SA Garan, B De Melo Quintela, **MS Olufsen**, JW Cho, JR Jahansooz, PK Bhullar, EKF Suen, WJ Piszker, NRB. Martins, MAM de Paula, RW Dos Santos, M Lobosco. *Mathematical Model of the Dynamics of Cytokine Expression and Human Immune Cell Activation in Response to the Pathogen Staphylococcus aureus*. Frontiers Cell Infect Microbiol 10, doi.org/10.3389/fcimb.2021.711153, 2021.
7. MJ Colebank, MU Qureshi, S Rajagopal, R Krasuski, **MS. Olufsen**. *A multiscale model of vascular function in chronic thromboembolic pulmonary hypertension*. Am J Physiology Heart and Lung Physiology, doi/10.1152/ajpheart.00086.2021, 2021.
8. EB Randall, NZ Randolph, A Alexanderian, **MS Olufsen**. *Global sensitivity analysis informed model reduction and selection applied to a Valsalva maneuver model*. J Theor Biol, doi/10.1016/j.tbi.2021.110759, 2021.
9. A Dobрева, R Brady, K Larripa, C Puelz, J Mehlsen, **MS Olufsen**. *A physiological model of the inflammatory-thermal-pain-cardiovascular interactions during a pathogen challenge*. J Physiol. 599(5):1459-1485, 2021. PMID: 33450068.
10. S Gilmore, J Hart, J Geddes, CH Olsen, J Mehlsen, P Gremaud, **MS Olufsen**. *Classification of autonomic dysfunction through data analytics*. Med Biol Eng Comput, doi:10.1007/s11517-021-0314-0, 2021. PMID: 33582941.

**2020**

11. LM Paun, MJ Colebank, **MS Olufsen**, NA Hill, D Husmeier. *Assessing model mismatch and model selection in a Bayesian uncertainty quantification analysis of a fluid-dynamics model of pulmonary blood circulation*, J Royal Soc Interface, doi.org/10.1098/rsif.2020.0886, 2020.
12. MJ Chambers, MJ Colebank, MU Qureshi, R Clipp, **MS Olufsen**. *Structural and hemodynamic properties in murine pulmonary arterial networks under hypoxia-induced pulmonary hypertension*. J Eng Med, Part H, Proc Inst Mech Eng. 234(11):1312-1329, 2020. doi: 10.1177/0954411920944110, 2020.
13. EB Randall, NZ Randolph, **MS Olufsen**. *Persistent instability in a nonhomogenous delay differential equation system of the Valsalva maneuver*. Math Biosci, 319:108292, 2020.
14. JR Geddes, J Mehlsen, **MS Olufsen**. *Characterization of blood pressure and heart rate oscillations of POTS patients via uniform phase empirical mode decomposition*. IEEE Trans Biomed Eng, 10.1109/TBME.2020.2974095, 2020.
15. AL Colunga, KG Kim, NP Woodall, JH Gennari, **MS Olufsen MS**. BE Carlson. *Deep phenotyping of cardiac function in heart transplant patients using cardiovascular systems models*. J Physiol, doi: 10.1113/JP279393, 2020.

16. AA Wright, G Fayad, J Selgrade, **MS Olufsen**. *Mechanistic model of hormonal contraception*. PLoS Comp Biol. PLoS Comp Biol, 16(6):e1007848, 2020.

## 2019

17. MJ Colebank, LM Paun, MU Qureshi, D Husmeier, M.S. Olufsen, L. Ellwein Fix. *Influence of image segmentation on pulse wave propagation models of the pulmonary circulation*. Royal Soc Interface, 16(159), doi:10.1098/rsif.2019.0284, 2019.
18. MJ Colebank, MU Qureshi, **MS Olufsen**. *Sensitivity analysis and uncertainty quantification of 1D models of the pulmonary circulation*. Int J Numer Meth Biomed Eng. e3242, 2019.
19. EB Randall, LS Brinth, A Billeschou, DA Beard, J Mehlsen, **MS Olufsen**. *Using modeling to predict parasympathetic and sympathetic function in response to the Valsalva maneuver*. J Appl Physiol, 127(5):1386-1402, 2019.
20. MU Qureshi, MJ Colebank, M Paun, L Ellwein Fix, N Chesler, MA Haider, NA Hill, D Husmeier, **MS Olufsen**. *Hemodynamic assessment of pulmonary hypertension in mice: a model-based analysis of the disease mechanism*. Biomech Model Mechanobiol, 18(1):219-243, 2019.
21. ND Williams, R Brady, S Gilmore, P Gremaud, HT Tran, JT Ottesen, J Mehlsen, **MS Olufsen**. *Cardiovascular dynamics during head-up tilt assessed via a pulsatile and non-pulsatile model*. J. Math Biol, 79(3):987-1014, 2019.
22. ND Williams, J Mehlsen, **MS Olufsen**, HT Tran. *An Optimal Control Approach for Blood Pressure Regulation during Heat-Up Tilt*. Biological Cybernetics, 113(1-2):149-159, 2019.
23. C Haargaard-Olsen, JT Ottesen, RC Smith, **MS Olufsen**. *Parameter subset selection techniques for problems in mathematical biology*, Biological Cybernetics, 113(1-2):121-138, 2019.
24. MV Ciocanel, SS Docken, RE Gasper, C Dean, BE Carlson, **MS Olufsen**. *Cardiovascular regulation in response to multiple hemorrhages - Analysis and parameter estimation*. Biological Cybernetics, 113(1-2):105-120, 2019.
25. PJ Thomas, **MS Olufsen**, R Sepulchre, PA Iglesias, A Ijspeert, M Scrivivan. *Control theory in biology and medicine*. Biological Cybernetics. 113(1-2):1-6, 2019.

## 2018

26. AD Marquis, A Arnold, C Dean-Bernhoft, BE Carlson, **MS Olufsen**. *Practical identifiability and uncertainty quantification of a pulsatile cardiovascular model*. Math Biosci. 304: 9-24, 2018.
27. LM Paun, MU Qureshi, MJ Colebank, NA Hill, **MS Olufsen**, MA, D Husmeier. *MCMC methods for inference in a mathematical model of pulmonary circulation*. Special issue article, Statistica Neerlandica, 72(3):306-338, 2018.
28. MU Qureshi, MJ Colebank, D Schreier, DM Tabina, MA Haider, NC Chesler, **MS Olufsen**. *Characteristic impedance: frequency or time domain approach?* Physiological Measurements, 39(1):014004 2018.
29. R Brady, DO Frank-Ito, HT Tran, S Janum, SB Pedersen, JT Ottesen, J Mehlsen, **MS Olufsen**. *Mathematical modeling of endotoxin-induced inflammatory response in young men*. Math Modeling Natural Phenomena, 13(5):42, 2018.

## 2017

30. A Mahdi, D Nikolic, AA Birch, **MS Olufsen**, RB Panerai, DM Simpson, SR Payne. *Increased blood pressure variability upon standing up improves reproducibility of cerebral autoregulation indices*. Med Eng Phys, 47:151-158, 2017.
31. EO Bangsgaard, PG Hjorth, **MS Olufsen**, J Mehlsen, JT Ottesen. *Integrated Inflammatory Stress (ITIS) model*. Bull Math Biol, 79(7):1487-1509, 2017. (PMID: 28643132)
32. A Arnold, C Battista, D Bia, Y Zocalo German, RL Armentano, HT Tran, **MS Olufsen**. *EnKF based inflow estimator for a 1D arterial network*. J Verification, Validation and UQ, 2(1), 011002 (Feb 22) 2017.
33. J Sturdy, JT Ottesen, **MS Olufsen**. *Modeling the differentiation of A- and C- type firing patterns in rat aortic baroreceptor*. J Comp Neurosci, 42(1):11-30, 2017.

## 2016

34. P Lee, BE Carlson, N Chesler, **MS Olufsen**, MU Qureshi, NP Smith, T Sochi, DA Beard. *Heterogenous mechanics of mouse pulmonary arterial network*. Biomech Model Mechanobiol. 15(5):1245-1261, 2016.

35. C Battista, D Bia, Y Zocalo, RL Armentano, MA Haider, **MS Olufsen**. *Wave propagation in a 1D fluid dynamics model validated using pressure-area measurements from ovine arteries*. J Mech Med Biol, 16:1650007 (26 pages), 2016.

## 2015

36. B Matzuka, J Mehlsen, HT Tran, **MS Olufsen**. *Using Kalman filtering to predict time-varying parameters in a model predicting baroreflex regulation during head-up tilt*. IEEE Trans Biomed Eng, 62(8):1992-2000, 2015.

37. G Mader, **MS Olufsen**, A Mahdi. *Modeling cerebral blood flow velocity during orthostatic stress*. Ann Biomed Eng, 43(8):1748-1758, 2015.

## 2014

38. JT Ottesen, J Mehlsen, **MS Olufsen**. *Structural correlation method for model reduction and practical estimation of patient specific parameters illustrated on heart rate regulation*. Math Biosci, 257:50-59, 2014.

39. MU Qureshi, GDA Vaughan, C Sainsbury, M Johnson, CS Peskin, **MS Olufsen**, NA Hill. *Numerical simulation of blood flow and pressure drop in the pulmonary arterial and venous circulation*, Biomech Model Mechanobiol, 13:1137-1154, 2014.

40. ND Williams, O Wind-Willassen, AA Wright, REU Program, J Mehlsen, JT Ottesen, **MS Olufsen**. *Patient specific modeling of head-up tilt*. Math Med Biol, 31(4): 365-392, 2014.

## 2013

41. A Mahdi, J Sturdy, JT Ottesen, **MS Olufsen**, *Modeling the afferent dynamics of the baroreflex control system*, PLoS Computational Biology, 9(12):e1003384, 2013.

42. LM Ellwein, SR Pope, A Xie, JJ Batzel, CT Kelley, **MS Olufsen**. *Modeling cardiovascular and respiratory dynamics in congestive heart failure*. Math Biosci, 241:56-74, 2013.

## 2012

43. M Aoi, K Hu, P Zhao, M-T Lo, M Selim, **MS Olufsen**, V Novak. *Impaired cerebral autoregulation associated with brain atrophy and worse functional status in chronic ischemic stroke*. PLoS ONE, 7(10): e46794, 2012.

44. **MS Olufsen**, NA Hill, GDA Vaughan, C Sainsbury, M Johnson. *Simulation of rarefaction: impact on blood pressure in the systemic and pulmonary large and small arteries*. J Fluid Mech, 705:280-305, 2012.

## 2011

45. JT Ottesen, **MS Olufsen**. *Functionality of the baroreceptor nerves in heart rate regulation*. Comp Meth Prog Biomed, 101(2):208-219, 2011.

46. BN Steele, D Valdez-Jasso, MA Haider, **MS Olufsen**. *Predicting arterial flow and pressure dynamics using a 1D fluid dynamics model with a viscoelastic wall*. Siam J Appl Math. 71(4):1123-1143, 2011.

47. D Valdez-Jasso, D Bia, Y Zocalo, RL Armentano, MA Haider, **MS Olufsen**. *Linear and nonlinear viscoelastic modeling of aorta and carotid pressure-area*. Ann Biomed Eng, 39(5):1438-1456, 2011.

## 2009

48. D Valdez-Jasso, HT Banks, MA Haider, D Bia, Y Zocalo, RL Armentano, **MS Olufsen**. *Viscoelastic models for passive arterial wall dynamics*, Adv Appl Math Mech, 1(2):151-165, 2009.

49. D Valdez-Jasso, MA Haider, HT Banks, D Bia, Y Zocalo, R Armentano, **MS Olufsen**. *Analysis of viscoelastic wall properties in ovine arteries*. Trans Biomed Eng, 56(2):210-219, 2009.

50. SR Pope, LM Ellwein, CL Zapata, V Novak, CT Kelley, **MS Olufsen**. *Estimation and identification of parameters in a lumped cerebrovascular model*. Math Biosci Eng, 6:93-115, 2009.

## 2008

51. K Devault, P Gremaud, V Novak, **MS Olufsen**, G Vernieres, P Zhao. *Blood flow in the circle of Willis: modeling and calibration*. Multiscale Mod Simul, SIAM Int J, 7:888-909, 2008.

52. KR Fowler, GA Gray, **MS Olufsen**. *Modeling heart rate regulation, Part II: Parameter identification*, Cardiovasc Eng, 8:109-119, 2008

53. LM Ellwein, HT Tran, CL Zapata, V Novak, **MS Olufsen**. *Sensitivity analysis and model assessment: mathematical models for arterial blood flow and blood pressure*. Cardiovasc Eng, 8:94-108, 2008
54. **MS Olufsen**, AV Alston, HT Tran, JT Ottesen, V Novak. *Modeling heart rate regulation, Part I: Sit-to-stand versus head-up tilt*. Cardiovasc Eng, 8:73-87, 2008.

**2007**

55. P Bai, HT Banks, S Dediu, AY Govan, M Last, A Lloyd, HK Nguyen, **MS Olufsen**, G Rempala, BD Slenning. *Stochastic and deterministic models for agricultural production networks*. Math Biosci Eng, 4:373-402, 2007.
56. BN Steele, **MS Olufsen**, and CA Taylor. *Fractal network model for simulating abdominal and lower extremity blood flow during resting and exercise conditions*. Comp Meth Biomech Biomed Eng, 10:39-51, 2007.

**2006**

57. **MS Olufsen**, HT Tran, JT Ottesen, REU program, LA Lipsitz, V Novak. *Modeling baroreflex regulation of heart rate during orthostatic stress*. Am J Physiol, 291:R1355-R1368, 2006.
58. DH Justice, HJ Trussell, **MS Olufsen**. *Analysis of blood flow velocity and pressure signals using the multipulse method*. Math Biosci Eng, 3:419-440 2006.

**2005**

59. **MS Olufsen**, JT Ottesen, HT Tran, LM Ellwein, LA Lipsitz, V Novak. *Blood Pressure and blood flow variation during postural change from sitting to standing - Mathematical modeling and experimental validation*. J Appl Physiol, 99:1523-1537, 2005.

**2004**

60. **MS Olufsen**, HT Tran, and LA Lipsitz. *Modeling cerebral blood flow control during posture change from sitting to standing*. Cardiovasc Eng, 4:47-58, 2004.
61. MS Olufsen and A Nadim. *On deriving lumped models for blood flow and pressure in the systemic arteries*. Math Biosci Eng, 1:61-80, 2004.

**2003**

62. **MS Olufsen**, MA Whittington, M Camperi, and N Kopell. *New roles for the gamma rhythm: Population tuning and preprocessing*. J Comp Neurosci, 14:33-54, 2003.

**2002**

63. **MS Olufsen**, A Nadim, and LA Lipsitz. *Dynamics of cerebral blood flow regulation explained using a lumped parameter model*. Am J Physiol, 282:R611-R622, 2002.

**2001**

64. **MS Olufsen**, LA Lipsitz, and A Nadim. *A lumped parameter model for cerebral blood flow regulation*. Advances in Bioengineering, 51:277-278, 2001.

**2000**

65. **MS Olufsen**, CS Peskin, WY Kim, EM Pedersen, A Nadim, and J Larsen. *Numerical simulation and experimental validation of blood flow in arteries with structured-tree outflow conditions*. Ann Biomed Eng, 28:1281-1299, 2000.
66. **MS Olufsen**. *A one-dimensional fluid dynamic model of the systemic arteries*. Stud Health Technol Inform, 71:79-97, 2000.

**1999**

67. **MS Olufsen**. *A structured tree outflow condition for blood flow in the large systemic arteries*. Am J Physiol, 276(1 PT 2):H257-H268, 1999.

**Books and book chapters**

68. JT Ottesen, V Novak, **MS Olufsen**. *Development of patient specific cardiovascular models predicting dynamics in response to orthostatic stress challenges*. In Mathematical modeling and validation in physiology: Applications to the

cardiovascular and respiratory systems Lecture notes in mathematics 2064, Math Biosci Subseries, J Batzel, M Bachar, F Kappel (Eds), Springer Verlag, Berlin - Heidelberg, pp 177-214, 2013.

69. JK Larsen, V Andreasen, H Larsen, **MS Olufsen**, JT Ottesen. Cardiovascular modelling at IMFUFA, in *The way through science and philosophy: Essays in honor of Stig Andur Pedersen*, HB Andersen, FV Christiansen, KF Jorgensen, VF Hendricks (Eds). Tributes Volume 4, College Publications, London, pp. 87-96, 2006.
70. JT Ottesen, **MS Olufsen**, and JK Larsen. *Mathematical Models in Human Physiology*. SIAM, Philadelphia, 2004.
71. **MS Olufsen**. *A one-dimensional fluid dynamic model of the systemic arteries*. In Computational Modeling in Biological Fluid Dynamics, LJ Fauchi and S Gueron (eds), IMA Volumes in Mathematics and its Applications, 124:167-188, 2001.

### Proceeding articles (peer reviewed)

72. M Bartolo, MJ Colebank, N Chesler, Nick Hill, **MS Olufsen**. *Pulmonary hypertension assessed using a fluid mechanics model*. World Congress of Biomechanics (WCB 22). Accepted Jan 2022 (2 pages)
73. **MS Olufsen**, MA Haider, S Rajagopal, MJ Colebank. *Using modeling to assess pulmonary hypertension*. World Congress of Biomechanics (WCB 22). Accepted Jan 2022 (2 pages)
74. MJ Colebank, **MS Olufsen**. *Multiscale hemodynamic predictions in chronic thromboembolic pulmonary hypertension*. Proc SB<sup>3</sup>C2021, abstract 092, 2021 (3 pages)
75. MA Bartolo, NA Hill, NC Chesler, **MS Olufsen**. Multiscale computational model predictions of shear stress and cyclic stretch in the pulmonary vasculature. Proc SB<sup>3</sup>C2021, abstract 122, 2021 (3 pages)
76. M Paun, MJ Colebank, **MS Olufsen**, D Husmeier. *Inference in cardiovascular modelling subject to medical interventions*, Proceedings of the 3rd International Conference on Statistics: Theory and Applications (ICSTA'21), Prague, Czech Republic, August 2021 (Best paper award).
77. B Banerjee, M H Kapourchali, M Baruah, M Deb, K Sakauye and **MS Olufsen**. *Synthesizing skeletal motion and physiological signals as a function of a virtual human's actions and emotions*, SIAM International Conference on Data Mining, April 29-May 1<sup>st</sup>, 2021.
78. LM Paun, MJ Colebank, U, Qureshi, **MS Olufsen**, NA Hill, D Husmeier. *MCMC with delayed acceptance using a surrogate model with an application to cardiovascular fluid dynamics*. Paper no 28. Int Conf on Statistics: Theor Appl (ICSTA'19), (8 pages), 2019
79. MA Haider, M Qureshi, NA Hill, **MS Olufsen**. *Application of the HGO model to capturing the pressure-area relationship in a large murine pulmonary artery under pulsatile flow*. 8<sup>th</sup> World Congress of Biomechanics, Dublin, Ireland P3058; (2 pages), 2018.
80. **MS Olufsen**, MJ Colebank, MU Qureshi, D Husmeier, N Chesler. *Uncertainty quantification in 1D fluid dynamics networks of pulmonary vasculature*. 8<sup>th</sup> World Congress of Biomechanics, Dublin, Ireland P3514 (2 pages), 2018.
81. MU Qureshi, MA Haider, **MS Olufsen**. *A numerical study of pulmonary vascular efficiency and right ventricular after-load during hypoxia induced pulmonary hypertension in mice*. 8<sup>th</sup> World Congress of Biomechanics, Dublin, Ireland O1395 (2 pages), 2018.
82. LM Paun, MU Qureshi, MJ Colebank, MA Haider, **MS Olufsen**, NA Hill, D Husmeier. *Parameter Inference in the Pulmonary Circulation of Mice*. 32<sup>nd</sup> Int Workshop on Stat Model (IWSM), (6 pages), 2017.
83. MU Qureshi, MA Haider, NC Chesler, **MS Olufsen**. *Simulating the effects of hypoxia on pulmonary hemodynamics in mice*. Proc 5<sup>th</sup> Int Conf Comp Math Biomed Eng (CMBE), (4 pages), 2017.
84. R Brady, C Pulez, I Ramirez, K Larripa, **MS Olufsen**. *A coupled model exploring the cardiovascular response to an acute inflammatory event*. Proc 5<sup>th</sup> Int Conf Comp Math Biomed Eng (CMBE), (4 pages), 2017.
85. A Mahdi, **MS Olufsen**, SJ Payne. *Mathematical model of the interaction between baroreflex and cerebral autoregulation*. Proc 4<sup>th</sup> Int conf on Comp Math Biomed Eng, EMBS, 2015.
86. C Battista, A Arnold, MU Qureshi, **MS Olufsen**. *Estimating boundary conditions for one-dimensional modeling of blood flow and pressure in arterial networks*. Proc 4<sup>th</sup> Int conf on Comp Math Biomed Eng, EMBS, 2015.
87. AA Wright, A Mahdi, **MS Olufsen**. *Closed loop baroreflex regulation of blood flow in the cardiovascular system*. Proc 3<sup>rd</sup> Int Conf Comp Math Biomed Eng, CMBE, 2013.



88. N Williams, HT Tran, **MS Olufsen**. *Cardiovascular dynamics during head-up tilt assessed via pulsatile and non-pulsatile modeling*. Proc 3<sup>rd</sup> Int conf on simulation and modeling methodologies, technologies, and applications, SciTe-Press, Sci Technol Pub, 2013.
89. CH Olsen, J Mehlsen, JT Ottesen, HT Tran, **MS Olufsen**. *Global sensitivity and identifiability analysis applied to a model predicting baroreflex regulation during head-up tilt*. Proc The 1<sup>st</sup> international workshop on innovative simulation for healthcare, I-WISH. W. Backfrieder, A. Bruzzone, F Longo, V Novak, J Rosen (eds), Rende (CS), Italy, pp. 81-86, 2012.
90. N Williams, HT Tran, **MS Olufsen**. *An optimal control approach to modeling head-up tilt*. Proc The 2nd international workshop on innovative simulation for healthcare, I-WISH. W Backfrieder, A Bruzzone, F Longo, V Novak, J Rosen (eds), Rende (CS), Italy, 2012.
91. B Matzuka, J Mehlsen, **MS Olufsen**, HT Tran, ND Williams. *A Kalman filtering based approach for the modeling of the cardiovascular regulation system*. Proc The 1<sup>st</sup> international workshop on innovative simulation for healthcare, I-WISH. W Backfrieder, A Bruzzone, F Longo, V Novak, J Rosen (eds), Rende (CS), Italy, pp. 107-112, 2012.
92. A Mahdi, JT Ottesen, **MS Olufsen**. *Qualitative features of a new baroreceptor model*. Proc The 1<sup>st</sup> international workshop on innovative simulation for healthcare, I-WISH. W Backfrieder, A Bruzzone, F Longo, V Novak, J Rosen (eds), Rende (CS), Italy, pp. 75-80, 2012.
93. JT Ottesen, **MS Olufsen**. *Structural correlation method for practical estimation of patient specific parameters in heart rate regulation*. Proc The 1<sup>st</sup> international workshop on innovative simulation for healthcare, I-WISH. W Backfrieder, A Bruzzone, F Longo, V Novak, J Rosen (eds), Rende (CS), Italy, pp. 136-143, 2012.
94. **MS Olufsen**, MA Haider, C Battista, BN Steele. *One-dimensional modeling of blood flow in viscoelastic arteries*. Proc ECOMAS, Vienna, Austria. (2 pages), 2012.
95. **MS Olufsen**, B Smith, J Mehlsen, J Ottesen. *The impact of gravity during head-up tilt*. Conf Proc IEEE Eng Med Biol Soc. DOI 10.1109/IEMBS.2011.6090669, pp 2399-2402, 2011.
96. JJ Batzel, LM Ellwein, **MS Olufsen**. *Modeling the single breath CO<sub>2</sub> test in patients with congestive heart failure*. Conf Proc IEEE Eng Med Biol Soc.. DOI 10.1109/IEMBS.2011.6090673, pp 2418-2421, 2011.
97. MC Aoi, B Matzuka, **MS Olufsen**. *Toward online, noninvasive, nonlinear assessment of cerebral autoregulation*. Conf Proc IEEE Eng Med Biol Soc. DOI 10.1109/IEMBS.2011/5090671, pp 2410-2413, 2011.
98. D Valdez-Jasso, D Bia, MA Haider, Y Zocalo, RL Armentano, **MS Olufsen**. *Linear and nonlinear viscoelastic modeling of ovine aortic biomechanical properties under in-vivo and ex-vivo conditions*. Conf Proc IEEE Eng Med Biol Soc. DOI 10.1109/IEMBS.2010.5626563, pp 2634-2637, 2010.
99. MC Aoi, CT Kelley, V Novak, **MS Olufsen**. *Optimization of a mathematical model of cerebral autoregulation using patient data*, 7th IFAC Symp Modelling and Control in Biomedical Systems, Volume 7, Part 1, DOI 10.3182/20090812-3-DK-2006.00031, pp 181-186, 2010.
100. JT Ottesen, **MS Olufsen**. *On the track of syncope induced by orthostatic stress - feedback mechanisms regulating the cardiovascular system*. 7th IFAC Symp Modelling and Control in Biomedical Systems, Volume 7, Part 1, DOI: 10.3182/20090812-3-DK-2006.00032, pp 187-191, 2010.
101. MC Aoi, P Gremaud, HT Tran, V Novak, **MS Olufsen**. *Modeling cerebral blood flow and regulation*. Conf Proc IEEE Eng Med Biol Soc. DOI 10.1109/IEMBS.2009.5334057, pp 5470-5473, 2009.
102. D Valdez-Jasso, MA Haider, SL Campbell, D Bia, Y Zocalo, RL Armentano, **MS Olufsen**. *Modeling viscoelastic wall properties of ovine arteries*. Proc ASME 2009, Summer Bioeng Conf, SBC2009-205640, 2009.
103. DH Justice, HJ Trussell, and **MS Olufsen**. *Using speech processing methods to model blood flow signals*. Proc European Signal Processing Conference (EUSIPCO), 2005.
104. DH Justice, HJ Trussell, and **MS Olufsen**. *Modeling of blood flow velocity and pressure signals using the multipulse method*. Proc IEEE Digital Signal Processing Workshop, DOI 10.1109/DSPWS.2004.1437967, pp 320-324, 2004.
105. **MS Olufsen** and A Nadim. *Lumped models for blood flow and pressure in the systemic arteries*. Proc MIT conf Comp Fluid and Solid Mech, KJ Bathe (ed). Elsevier Science, 2:1786-1789, 2003.



106. **MS Olufsen**, A Nadim, and L Lipsitz. *Autoregulation of cerebral blood flow*. Proc IEEE Ann Northeast Bioeng Conf, 41-42, 2000.
107. **MS Olufsen** and JT Ottesen. *Outflow conditions in human arterial flow*. In Computer simulations in biomedicine, Proc Third Int Conf Comput Simul Biomed, Biomed '95. H Power, RT Hart (eds). Computational Mechanics Publications, 249-256, 1995.

#### Other (peer reviewed)

108. J Geddes, **MS Olufsen**. How signal processing and mechanistic models can help diagnose Postural Orthostatic Tachycardia Syndrome (POTS). SIAM News Online, Oct 2021.
109. KA Windoloski, **MS Olufsen**. Coupling vascular and inflammatory dynamics. SIAM News Online, Oct 2021.
110. G Pontrelli, **MS Olufsen**, JT Ottesen. *Mathematical methods and models in system biomedicine*. Editorial, Math Biosci, 257:1 2014. (PMID: 25443447)
111. J Batzel, V Novak, F Kappel, **MS Olufsen**, HT Tran. *Introduction to the special issue: short-term cardiovascular-respiratory control mechanisms*, Cardiovasc Eng, 8(1):1-4 2008.
112. C Yang (work with R Levy, **MS Olufsen**, T Witelski). *Modeling effects of aging on blood flow and pressure in the arterial system*, Vertices, Duke Uni J Sci Technol, 23:6-15, 2006.

#### PRESENTATIONS

##### Invited conference and workshop presentations

1. 8<sup>th</sup> European Cong on Comp Meth in Appl Sci Eng (ECCOMAS), Oslo, Norway, June 2022
2. Int Conf Comp Mech and Math Biomed Eng (CMBE), Invited minisymposium speaker, June 2022
3. BAMB (Biology and Medicine through Mathematics Conference), Invited Plenary Speaker, May 2022
4. 16h US National Congress on Computational Mechanics (Virtual), Invited plenary minisymposium speaker, July 25-29, 2021.
5. BMC-BAMC Conference (Virtual), Invited minisymposium speaker, April 5-7, 2021 (moved from April 2020).
6. The Virtual Journal Club, The Journal of Physiology. Invited to discuss recent publication “*A physiological model of the inflammatory-thermal- pain-cardiovascular interactions during a pathogen challenge*” Panel: Mette Olufsen (senior author – presenter), Eleonora Grandi (Editor), Renee Bradi Nicholls (First author), March 17<sup>th</sup>, 2021
7. SIAM Life Sciences (Virtual), Invited minisymposium speaker, June 11-July 2<sup>nd</sup>, 2020.
8. 9<sup>th</sup> International Bio-Fluid Mechanics and Vascular Mechano-Biology Symposium, Invited Speaker, Feb 2020.
9. TagMac, University of Chapel Hill, Invited Plenary Speaker, Nov 2019.
10. Invited presentation at the 15th US National Congress on Computational Mechanics, July 2019
11. Organized MRC-AMS satellite meeting connected to SIAM Life Sciences July 2018
12. Siam Life Sciences, Aug 2018. Invited minisymposium talk.
13. 5<sup>th</sup> World congress of biomechanics, Dublin, Ireland, Aug 2018. Invited poster presenter.
14. Workshop on Waves in Neural Media, The Fields Institute, Sep 5-8, 2017. Invited speaker.
15. Computational & Mathematical Biomedical Engineering (CMBE) conference, University of Pittsburgh, April 10-12, 2017. Invited speaker.
16. Parameter Estimation and Uncertainty Quantification for Dynamical Systems, University of Pittsburgh, Mar 5-6, 2017. Invited speaker.
17. Joint Math Meeting (JMM), Atlanta, Jan 4-7, 2017. Invited to speak in MRC session.
18. SIAM Life Sciences, Boston, MA, Jul 11-14<sup>th</sup>, 2016. Invited to speak in special session celebrating Peskin’s 70 birth day.
19. AMS Fall Sectional Meeting, Memphis, TN, Oct 17-18, 2015. Invited plenary speaker.
20. NCSB Annual Meeting, Albuquerque, NM, Jul 9-10, 2015. Invited lightning talk and poster presenter.
21. 4<sup>th</sup> Int Conf Comp & Math Biomed Eng (CMBE), Paris, France, June 29-Jul 1<sup>st</sup>, 2015. Invited speaker.
22. SAMSI workshop. Uncertainties in computational hemodynamics, June 1-3, 2015. Invited speaker.

23. 7<sup>th</sup> World congress of Biomechanics, Boston, MA, July 6-11, 2014. Invited minisymposium speaker.
24. VPR P50 Site Visit, University of Michigan, Ann Arbor, MI. July 29<sup>th</sup>, 2014. Invited speaker.
25. MBI current topics workshop, Molecular systems to physiology, May 5-9, 2014. Invited speaker.
26. ICERM workshop, Brown University. From the clinic to partial differential equations and back: Emerging challenges for cardiovascular mathematics, Jan 20-24, 2014. Invited speaker.
27. 12<sup>th</sup> US Nat Congress on Comp Mechanics (USNCCM12), NC, July 22-25<sup>th</sup>, 2013. Invited minisymposium speaker.
28. Virtual Rat Physiology, Advisory board meeting, Milwaukee, July 26-27, 2012. Invited speaker.
29. International workshop on innovative simulation for healthcare (IWISH), Vienna, Austria, Sep 2012. Invited speaker.
30. ECCOMAS 2012, Vienna, Austria, Sep 2012. Invited symposium speaker.
31. TJP fest. Conference in the honor of Tim Pedley's 70 Birthday, Cambridge, UK, April 2012. Invited speaker.
32. EMBC 2011, Boston, MA, Aug 2011. Invited symposium speaker.
33. World congress on computational and mathematical modeling of cardiovascular cardiopulmonary dynamics. William & Mary, Williamsburg, VA, May 2011. Invited speaker.
34. SCOPE academy, NCSU, Apr 2011. Invited speaker.
35. 2010 Fall southeastern sectional meeting, Richmond, VA, Nov 2010. Invited speaker, special session on mathematical models in biology and medicine.
36. NHLBI/VCU workshop on modeling/simulation of neural control of the cardiovascular/ cardiopulmonary system, Richmond, VA, Mar 2010. Invited speaker.
37. 9<sup>th</sup> Int symposium on computer methods in biomechanics and biomedical engineering, Valencia, Spain, Feb 2010. Invited symposium speaker.
38. 7<sup>th</sup> IFAC symposium on modeling and control in biomedical systems, Aalborg, Denmark, Aug 2009. Invited speaker.
39. 2009 Spring southeastern section meeting, Raleigh, NC, Apr 2009. Invited minisymposium speaker.
40. AMS southeast sectional meeting, Raleigh, NC, Apr 2009. Invited symposium speaker.
41. NIH-NHLBI workshop on computational and Mathematical modeling applications in cardiovascular dynamics, VCU, Richmond, VA, Mar 2008. Invited to give two-hour lecture on blood flow modeling.
42. ICIAM 2007, Zurich, Switzerland, Jul 2007. Invited minisymposium speaker.
43. Applications of analysis to math biology. A conference in honor of Michael C. Reed, Duke University, Searle Conference Center, Durham, NC, May 2007. Invited speaker.
44. Workshop on blood flow in the microcirculation: function, regulation, and adaptation. MBI, The Ohio State University, Columbus, OH, Jan 2007. Invited speaker.
45. Meeting honoring Charles Peskin's 60<sup>th</sup> birthday, Courant Institute, NYU, NY, Oct 2006. Invited speaker.
46. Sarajevo summer school. Mathematical techniques in modeling physiological systems, Sarajevo, Bosnia, Sep 2006. Invited to teach a module on model analysis.
47. Pulmonary circulation workshop, VCU, Richmond, VA, Jun 2006. Invited plenary speaker. Experimental biology, San Francisco, Apr 2006. Invited symposium speaker, symposium on trends in experimental pathology sponsored by Robert E. Stowell.
48. Mini-invasive procedures in medicine and surgery: Mathematical and numerical challenges. CRM workshop, Montreal, Canada, May 2005. Invited to present a one-hour lecture.
49. Redraider minisymposium. Mathematical and computational modeling of biological systems, Texas Tech University, Austin, TX, Nov 2003. Outstanding early career speaker, invited to give one-hour lecture.
50. AMS fall southeastern meeting, Chapel Hill, NC, Oct 2003. Invited minisymposium speaker.
51. 2<sup>nd</sup> MIT conf on computational fluid and solid mechanics, Boston, MA, Jun 2003. Invited minisymposium speaker.
52. 5<sup>th</sup> Conference on mathematical modeling & computing in biology and medicine, Milan, Italy, Jul 2002. Invited minisymposium speaker.
53. BMES annual fall meeting, Durham, NC, Nov 2001. Invited minisymposium speaker.
54. IEEE 26<sup>th</sup> annual northeast bioengineering conference, University of Connecticut, Storres, CT, Apr 2001. Invited minisymposium speaker.
55. Workshop on bio-medical simulation, CRS4, Calgary, Italy, June 1997. Invited speaker.

**Conference and workshop organization**

56. SB3C (Virtual). Organized minisymposium with two parts, June 2021
57. SMB annual meeting (Virtual) Organized minisymposia with three parts, June 2021
58. SIAM Conference on Computational Science and Engineering, Organized minisymposium with two parts, Mar 2021
59. SIAM Life Sciences (Virtual). Organized minisymposium with three parts, June 2020
60. BMC-BAMC Conference. Organized minisymposium with 10 speakers, April 2020 (moved to April 2021)
61. SIAM Conference on Uncertainty Quantification (Canceled), Organized minisymposium with two parts, Mar 2020
62. Organized track at the 15th US National Congress on Computational Mechanics, July 2019
63. Organized MRC-AMS satellite meeting connected to SIAM Life Sciences July 2018
64. Siam Life Sciences, organized minisymposium on patient-specific Modeling of Human Physiological Processes, Aug 6-9, 2018
65. AMS Miniconference on parameter estimation, organized conference, Aug 9, 2018
66. SMB annual meeting. Organized minisymposium on transport and control in systems physiology and gave a presentation. July 17-20, 2017
67. Tutorial Workshop on Parameter Estimation for Biological Models, NC State University, July 28-31, 2016. Research presentation.
68. SIAM Life Sciences, Boston, MA, Jul 11-14<sup>th</sup>, 2016. Organized minisymposium with three parts.
69. Mathematical Research Community (AMS) workshop "Mathematics in Physiology and Medicine", Snowbird, Utah, June 19-25, 2016. Organized workshop.
70. Tutorial Workshop on Parameter Estimation for Biological Models, NC State University, Aug 8-11, 2014. Research presentation.
71. SIAM life sciences, Charlotte, NC. Aug 4-7, 2014. Organized conference.
72. SIAM life sciences, San Diego, CA, Aug 2012. Organized conference.
73. ICIAM 2011, Vancouver, Canada, July 2011. Organized minisymposium and speaker.
74. 8<sup>th</sup> European conference on mathematical and theoretical biology, Krakow, Poland, June 2011. Organized minisymposium and speaker.
75. SIAM life sciences, Pittsburgh, PA, July 2010. Organized minisymposium and speaker.
76. SIAM computational science and engineering, Miami, FL, Mar 2009. Organized minisymposium and speaker.
77. SIAM life sciences, Montreal, Canada, Aug 2008. Organized minisymposium and speaker.
78. BMES annual fall meeting, Los Angeles, CA, Sep 2007. Organized preconference workshop and minisymposium. Gave two invited presentations.
79. Dynamics of blood flow models and experiments, Workshop SAMSI, RTP, NC, May 2007. Organized workshop.
80. SIAM life sciences, Raleigh, NC, Jul 2006. Organized minisymposium and speaker.
81. SIAM annual meeting, New Orleans, LA, Jul 2005. Organized minisymposia and speaker.
82. SIAM life sciences, Portland, OR, Jul 2004. Organized minisymposium and speaker.
83. ICIAM 2003, Sydney, Australia, Jul 2004. Organized minisymposium and speaker, Jul 2004.
84. SIAM life sciences, Boston, MA, Mar 2002. Organized minisymposium and speaker.
85. ICIAM 1999, Edingburgh, Scotland, July 1999. Organized a minisymposium and speaker.

**Contributed conference presentations**

86. 10<sup>th</sup> World congress of biomechanics, Taiwan, Jul 2022. Presented a contributed poster.
87. 4<sup>th</sup> World congress of biomechanics, Calgary, Canada, Aug 2002. Presented a contributed talk and was invited to chair a session.
88. ASME international mechanical engineering congress & exposition, New York, NY, Nov 2001. Contributed talk.
89. 5<sup>th</sup> International conference on cognitive and neural systems, Boston, MA, May 2001. Contributed poster.
90. Society for neuroscience annual meeting, New Orleans, LA, Nov 2000. Presented a contributed poster.
91. Workshop on computational modeling in biological fluid dynamics, IMA, Minneapolis, MN, Jan 1999. Contributed poster.
92. APS division of fluid dynamics, 51<sup>st</sup> annual meeting, Philadelphia, PA, Nov 1998. Contributed talk.

93. 3<sup>rd</sup> World congress of biomechanics, Sapporo, Japan, Aug 1998. Contributed talk.
94. 1<sup>st</sup> topical meeting on biophysics and biological Physics, Niels Bohr Institute, Denmark, Mar 1998. Contributed talk.
95. International conference on mathematical modeling in medicine, IMFUFA, Roskilde University, Denmark, Sep 1997. Contributed talk.
96. World congress on medical physics and biomedical engineering, Nice, France, Sep 1997. Contributed talk.
97. 1<sup>st</sup> workshop on industrial mathematics for Nordic PhD students, Hillerod, Denmark, Aug 1997. Contributed talk.
98. Anziam graduate student day, Australian Defense Force Academy, University of New South Wales, Canberra, Australia, Oct 1995. Contributed talk.
99. 3<sup>rd</sup> International conference for simulations in biomedicine, Biomed '95, Milan, Italy, Jun 1995. Contributed talk.

### **Invited seminars and colloquia**

100. Dynamics seminar, Boston University, Oct 2021.
101. Undergraduate research seminar, Boston University, Oct 2021.
102. Computational Biology Club, NCSU, Seminar, Sep 2021.
103. Meet a scientist, NC public schools (Virtual), 8<sup>th</sup> grade, Oct 2020.
104. Bioengineering Colloquium, UCSD (Virtual), Oct 2020.
105. Meet a scientist, NC public schools (Virtual), 5<sup>th</sup> grade, May 2020.
106. University of Glasgow, SoftMech, Seminar, May 2019.
107. Biology Colloquium, New Jersey Institute of Technology (NJIT), Nov 2018.
108. Biomathematics Colloquium, University of Tennessee, Knoxville, TN UTK, Feb 2018.
109. Department Colloquium, New Jersey Institute of Technology (NJIT), Dec 2017.
110. Department Seminar, Department of Mathematics, Creighton University, Omaha, NE, Oct 2017.
111. Mathl Biology Seminar, presentation for REU program, Department of mathematics, Duke University, Jun 2017.
112. Biomath Seminar, Department of Mathematics, Virginia Commonwealth University, Feb 2017.
113. Journal Club on Parameter Estimation (Tutorial), Dept of Mathematics Virginia Commonwealth University, Feb 2017.
114. SoFTMech Seminar, Department of Mathematics, University of Glasgow, UK, Sep 2016.
115. Department of Mathematics Colloquium, University of Colorado, Colorado Springs, Feb 2016.
116. Mathematics Department Colloquium, IUPUI, Feb 2014.
117. Math Biology Seminar, presentation for REU program, Department of mathematics, Duke University, Jun 2013.
118. Numerical Analysis Seminar, NC State University, Feb 2013.
119. Differential Equations Seminar, NC State University, Jan 2013.
120. Seminar, Center for Computational Science, Tulane University, Nov 2012.
121. Seminar, Department of Physiology, Kings College, London, UK, Apr 2012.
122. Differential equations seminar, Department of Mathematics, NCSU, Jan 2012.
123. Applied mathematics seminar, Department of Mathematics, University of Delaware, Newark, Delaware, Dec 2011.
124. Mathematics colloquium, University of North Carolina, Charlotte, NC, Oct 2011.
125. Seminar, Department of Mathematics, Rochester Institute of Technology (RIT), Rochester, NY, Oct 2011.
126. Seminar, Inst Comp and Eng Science and Engineering (ICASE), University of Texas, Austin, TX, Nov 2010.
127. Seminar, Department of Mathematics, University of Glasgow, Glasgow, Scotland, Mar 2010.
128. Seminar, Department of Mathematics and Physics, Roskilde University, Denmark, Oct 2009.
129. Seminar, School of Mathematics, University of Graz, Austria, Mar 2009.
130. Numerical analysis seminar, Department of Mathematics, NCSU, Dec 2008.
131. Numerical analysis seminar, Department of Mathematics, UNC Chapel Hill, NC, Jan 2008.
132. Seminar, Merck Inc, Whitehouse Station, NJ, July 2007.
133. Seminar, MBI, The Ohio State University, Columbus, OH, Feb 2006.
134. Seminar, Department of Mechanical Engineering, Imperial College, London, UK, Dec 2005.
135. Seminar, Division of Health Sciences and Technology, MIT, Cambridge, MA, Sep 2005.
136. Numerical analysis seminar, Department of Mathematics, NCSU, Aug 2005.

137. Seminar, Department of Anesthesiology, Mayo Clinic, Jacksonville, FL, Jun 2005.
138. Special topics course in biomathematics, Dept of Math and Physics, Roskilde University, Denmark, Mar 2005.
139. Physics colloquium, Department of Physics, UNC Wilmington, NC, Feb 2005.
140. HHMI lecture, Meredith College, Raleigh, NC, Nov 2004.
141. AWM seminar, Department of Mathematics, Duke University, Durham, NC, Apr 2004.
142. Seminar, Department of Mathematics and Physics, Roskilde University, Denmark, Mar 2004.
143. HHMI lecture, Salem College, Winston Salem, NC, Dec 2004.
144. Seminar, Department of Electrical and Computer Engineering, NCSU, Raleigh, NC, Sep 2003.
145. PDE/Applied math seminar, Department of Mathematics, University of Houston, TX, Nov 2002.
146. Applied mathematics seminar, Department of Mathematics, UNC Chapel Hill, NC, Sep 2002.
147. Seminar, Istituto per le Applicazioni del Calcolo – CNR Viale del Policlinico, Rome, Italy, Jul 2002.
148. Seminar, Keck Graduate Institute, Claremont Colleges, Claremont, CA, Jun 2002.
149. Differential equations seminar, Department of Mathematics, NCSU, Raleigh, NC, Nov 2001.
150. Numerical Analysis Seminar, Department of Mathematics, NCSU, Oct 2001.
151. Neuroscience seminar, Boston University, Boston, MA, Apr 2000.
152. Research in progress seminar, Res. and Training Institute, Hebrew Rehab Center for Aged, Boston, MA, Nov 1999.
153. Fluid mechanics seminar, Department of Mechanical Engineering, MIT, Cambridge MA, Nov 1999.
154. Center for BioDynamics seminar, Department of Mathematics, Boston University, Boston, MA, Feb 1999.
155. Brown bag seminar, Dept of Aerospace and Mechanical Engineering, Boston University, Boston, MA, Jan 1999.
156. Graduate student seminar, Department of Mathematics, Duke University, Durham, NC, Apr 1998.
157. Mathematics seminar, Department of Mathematics, Australian Defense Force Academy, University of New South Wales, Canberra, Australia, Aug 1995.

## MENTORING

### Postdocs

1. Atanaska Dobreva, July 2018-July 2020, NSF-RTG postdoc. Currently Postdoc School of Mathematics and Natural Sciences, University of Arizona, AZ
2. Umar Qureshi, Sep 2014 – July 2019 NIH-VPR/NSF-Co-PI postdoc. Currently Scientific Consulting and Grant Writing Specialist, Eva Garland Consulting, Raleigh, NC
3. Andrea Arnold, Aug 2014 – May 2017, NSF-RTG postdoc. Currently Assistant Professor, Worcester Polytechnic Institute, Worcester, MA
4. Adam Mahdi, Jan 2012 – May 2014 NIH-VPR postdoc. From October 1<sup>st</sup> 2021, Lecturer, Internet Institute, Oxford University, UK.

### Graduate students (19 total)

**DIVERSITY (a) 11 Female, (b) 3 African American and 2 Hispanic, (c) 7 First in their family to receive degree beyond high school**

### Current students

1. Christopher Schell, PhD Student, Biomathematics, expected graduation, Dec 2026
2. Alyssa Taylor, PhD Student, Biomathematics, expected graduation, Dec 2024. Awarded NSF-GRFP fellowship (a)
3. Michelle Bartolo, PhD Student, Biomathematics, expected graduation, May 2024 (a)
4. Kristen Windoloski, PhD Student, Applied Mathematics, expected graduation, May 2023 (a)
5. Justen Geddes, PhD Student, Applied Mathematics & Biomathematics, expected graduation, May 2023. Honorable Mention NSF-GRFP fellowship (c)
6. Amanda Colunga, PhD Student, Applied Mathematics, expected graduation, August 2022. Awarded GEM fellowship (a,b,c)

**Former graduate students (PhD)**

7. Andrew Wright, PhD Biomathematics, May 2022. Research Scientist, Biomath Modeling.
8. Megan Chambers, PhD Mathematics, May 2022. Lecturer Applied Mathematics, Virginia Military Academy.
9. Mitchel Colebank, PhD Biomathematics, April 2021. AHA predoc fellowship. Postdoc Biomedical Engineering, University of California, Irvine. Awarded NIH-TL1 postdoc fellowship.
10. Benjamin Randall, PhD Applied Mathematics & Physiology, July 2019. Postdoc Physiology, University of Michigan. Awarded NIH-F32 postdoc fellowship (c).
11. Renee Brady, PhD Applied Mathematics, July 2017. Postdoc Moffitt Cancer Center, Tampa FL (a,b,c)
12. Greg Mader, PhD BioMathematics, Dec 2016. Researcher Research Triangle Institute, RTP.
13. Christina Battista, PhD Applied Mathematics, Aug 2015. (co-advised with Mansoor Haider). Postdoc UNC-Chapel Hill, NC. Currently Senior Scientist at DILLsymServices (a,c)
14. Christian Haargaard Olsen, PhD BioMathematics, December 2014 (co-advised with Hien Tran). Senior Statistical Programmer, Novo Nordisk, Denmark.
15. Nakeya Williams, PhD Applied Mathematics May 2014 (co-advised with Hien Tran). Assistant Professor at United States Merchant Marine Academy, Kings Point, NY (a,b,c)
16. Mikio Aoi, PhD BioMathematics, Aug 2011. Postdocs at Boston University and Princeton. Currently Assistant Professor, Halicioglu Institute for Data Science and Department of Biological Sciences, UCSD, CA
17. Daniela Valdez, PhD BioMathematics, Aug 2010 (co-advised with Mansoor Haider). Postdoc University of Pennsylvania. Awarded AHA postdoc fellowship. Currently Assistant Professor, Department of Biomedical Engineering, UCSD, CA. Awarded NSF-Career award 2021 (a,b)
18. April Allston, PhD Applied Mathematics, Aug 2009 (co-advised with Hien Tran). SAS, Cary, NC (a,b,c)
19. Laura M. Ellwein, PhD Applied Mathematics, Aug 2008. Postdoc Marquette University. Awarded AHA postdoc fellowship. Currently Associate Professor, Department of Mathematics, VCU (a)

**Former graduate students (MS)**

20. Steven Gilmore, MS Applied Mathematics, May 2019. PhD NCSU Applied Mathematics, May 2021.
21. Marshal Davey, MS Physiology, May 2017. Research Assistant (PhD Student), UNC Chapel Hill.
22. Francis Polakiewicz, MS BioMathematics, May 2016, EPA, RTP, NC.
23. Michael Frank, MS BioMathematics, May 2016.
24. Jacob Sturdy, MS BioMathematics, Dec 2014. PhD and postdoc University of Trondheim, Norway.
25. Anna Hart, MS Applied Mathematics, Dec 2006.
26. Cynthia Chmielewski, MS BioMathematics, Aug 2003.

**Undergraduate students**

1. Derek Justice, BS in Electrical Engineering, NCSU, May 2003
2. David Hysom, BS in Mathematics, NCSU, Dec 2003
3. Mark Harris, BS in Mathematics and Physics, NCSU, May 2004.
4. Daniela Valdez, BS in Applied Mathematics, NCSU, May 2005
5. David Robinson, BS/MS in Mathematics and Statistics, NCSU, May 2006
6. REU 2005-2015: ~4 students per year
7. Eamon Tweedy, BS in Applied Mathematics, NCSU, May 2006
8. Sato Ito, BS in Applied Mathematics NCSU, May 2010.
9. Brittany Smith, BS in Mathematics NCSU, Jan 2012
10. David Moreau, BS in Mathematics NCSU, May 2013
11. Andrew Wright, BS in Applied Mathematics NCSU, May 2013
12. Paul Brockington, BS in Applied Mathematics NCSU, May 2015
13. Steven Gilmore, BS in Applied Mathematics NCSU, May 2015
14. Samantha Faber, BS in Mathematics NCSU, May 2015

15. Daniel Bullock, BS in Biology NCSU, May 2015
16. Andrew Marquis, BS Applied Mathematics, NCSU, May 2016
17. Anna Yarbrough, Applied Mathematics, NCSU, May 2018
18. Payton Nichols, Mathematics, NCSU, May 2019
19. Nick Randolph, Mathematics, NCSU, May 2020
20. Matt Sheldon, Mathematics, NCSU, May 2020
21. Macie King, Mathematics, NCSU, May 2020
22. Christopher Schell, Mathematics, NCSU, Dec 2020
23. Mariam Kharbat, NCSU, May 2021
24. Ian Livengood, NCAT, May 2021
25. Natalie Johnston, Vassar College, May 2021
26. Miya Spinelli, UMass Dartmouth, expected graduation May 2022
27. Perry Beamer, University of Maryland, expected graduation May 2022
28. Nicole Gallagher, Boston University, expected graduation May 2022
29. Caroline Hammond, University of Delaware, expected graduation May 2022
30. Teresa Jones, Virginia Wesleyan University, expected graduation May 2022

### Recent student awards

1. 2022: DRUMS REU student awards: Fulbright fellowship (Nathan Rowan, XXX), NSF-GRFP (John Hood, Bowdoin College)
2. 2022: NCSU Undergraduate student (co-author two manuscripts with Ben Randall) awarded NSF-GRFP
3. 2021: NSF-GRFP Award Alyssa Taylor
4. 2021: Best Paper Prize Mitchel Colebank (co-author - paper presented at ISCSTA21, July 2021)
5. 2021: Best PhD Oral Presentation, 5<sup>th</sup> Soft Tissue Modeling Workshop, SoftMech, June 2021
6. 2021: Winston Rose Research Award Mitchel Colebank
7. 2021: Outstanding Research Award (for Undergraduates) Christopher Schell
8. 2021: JMM poster honorable mention Ian Livengood, Mariam Kharbat, Natalie Johnston, Miya Spinelli
9. 2020: Gold Medal STEM for Britain (House of Commons) Mihaela Paun (University of Glasgow)
10. 2020: NSF-GRFP Honorable Mention Justen Geddes
11. 2020: JMM best poster award Christopher Schell, Macie King, Matt Sheldon
12. 2020: JMM poster honorable mention Nick Randolph
13. 2019: AHA Research fellowship, Mitchel Colebank
14. 2019: GEM fellowship, Amanda Colunga

### SERVICE

#### NCSU

1. Director DRUMS REU program (2020-24)
2. Faculty Advisory Committee (2020-22)
3. Organizer Tutorial Workshop on Parameter Estimation for Biological Models, July 2014, 2016, 2018
4. Faculty mentor REU and RTG summer programs (2005-19)
5. Faculty mentor mathematical modeling workshops 2004-2009 co-organizer (2002, 2004-06)
6. Lectures SUM series and first year seminars (2009-21)
7. Co-organizer Biomathematics Seminar (2005-21)
8. Wrote numerous promotion recommendations for promotion with tenure, full professor, and recommendation letters for students and postdocs (2001-)
9. Faculty mentor for one junior faculty member (2021-)



## 10. Committees:

Standing Committees

- a. College RPT committee (2020-22)
- b. RPT committee (2015-19)
- c. TA workload committee (2018-19)
- d. Colloquium committee (2017-19)
- e. Undergraduate assessment (2019)
- f. Undergraduate assessment committee (2014)
- g. Graduate recruitment mathematics and biomathematics and committee (2002-21)
- h. Undergraduate recruitment committee (2004-06)

Hiring Committees

- i. General department of mathematics hiring committee (2005-06)
- j. Departmental postdoctoral hiring committee (2011-12)

Ad-hoc Committees

- k. RTG postdoc hiring (2014-18)
- l. Biomathematics hiring committee (2020-21)
- m. Department head 5-year review committee (2020)
- n. Mathematics department evaluation committee (2008-09)
- o. Building committee (2003-04)
- p. Biomathematics seminar (organizer: 2002-2004 and 2006-2008 and 2014-21)
- q. Invited to talk at the PAMS alumni SCOPE academy (2011)
- r. Organized SAMSI workshop on dynamics of blood flow models and experiments (2007)
- s. Organized biomathematics seminar (2002-04 and 2006-08)
- t. Group leader SAMSI working group on agricultural systems under the program on national defense and home-land security (2005-06)
- u. HHMI lectures organized by the Science House. Department of Mathematics, Meredith College, Raleigh, NC. November (2004) and Salem College, Winston Salem, NC. December (2004)
- v. Mentored HHMI-RISE incoming student (2004). Organized by the Science House

**Externally**

1. Co-organizer workshop 3 - control of disease, Mathematical Biosciences Institute, Oct 2017
2. Co-organizer emphasis semester on control in biology and medicine, Mathematical Biosciences Institute, Fall 2017
3. Mathematical Research Community (AMS) workshop "Mathematics in Physiology and Medicine", Snowbird, Utah, June 19-25, 2016. Organized workshop
4. Main organizer SIAM Life Sciences, Charlotte, 2012 and 2014
5. Organizer MBI workshop: Molecular to systems physiology, May 2014
6. Track organizer, International Workshop on Innovative Simulation for Healthcare, 2012-2014
7. World congress on computational and mathematical modeling of cardiovascular cardiopulmonary dynamics, Member of the scientific program committee, May 2011
8. Scientific program committee, NHLBI-VCU World Congress on Computational and Mathematical Modeling of Cardiovascular and Cardiopulmonary Dynamics, 2011. William & Mary, Williamsburg, VA
9. Co-organizer, MBI workshop: Computational challenges in integrative biological modeling, Oct 2009
10. Workshop organizer: Short-term Cardiovascular-Respiratory Control Mechanisms, sponsored by AIM, Oct 2006
11. Group leader for the agricultural systems working group. Program on national defense and homeland security (NDHS), SAMSI 2005-2006
12. Cardiac modeling workshop, Dept of Mathematics, Roskilde University, Denmark. Organized workshop, May 1998

**Review activities**

- Guest editor, Biological Cybernetics Special Issue (2017 – 2019)
- Editorial board, Mathematical Biosciences and Engineering (2007 – Present)
- Editorial board, Frontiers in Applied Mathematics and Statistics (2021 – Present)
- Editorial board, Frontiers in Physiology (2020 – Present)
- Reviewed manuscripts for
  - American Journal of Physiology
  - Annals of Biomedical Engineering
  - Autonomic Neuroscience: Basic and Clinical, Cardiovascular Engineering
  - Bulletin of Mathematical Biology
  - Cell Biochemistry and Biophysics
  - Computational Methods in Applied Mechanics
  - Computer Methods in Biomechanics and Biomedical Engineering
  - IEEE Transactions of Biomedical Engineering
  - Journal of Biomechanics
  - Journal of Biomedical Engineering
  - Journal of Computational Neuroscience
  - Journal of Engineering Mathematics
  - Journal of Fluid Mechanics
  - Journal of General Physiology
  - Journal of Mathematical Analysis and Applications
  - Journal of Mathematical Biology
  - Journal of Physiology
  - Journal of Theoretical Biology
  - Mathematical Biosciences
  - Mathematical Biosciences and Engineering
  - Mathematical Models and Methods in Applied Sciences
  - Medical Engineering and Physics
  - Physics of Fluids
  - PLoS one
  - Scandinavian Cardiovascular Journal
  - SIAM Journal of Applied Mathematics
  - The European Physical Journal
  - *The Journal of Engineering in Medicine*
  - Reviewed conference manuscripts for IEEE-EMBS Eng Med Biol Conf
  - Proc Institution of Mechanical Engineers, published in The Journal Engineering in Medicine
- Reviewed book for SIAM on introduction to mathematics in biology (the book is still in process)
- Evaluated one book proposal submitted to SIAM
- Reviewed proposals for
  - NSF
  - NIH
  - British Medical Research Council
  - Marsden Fund, New Zealand
  - Office of Naval Research
  - New Zealand Research Foundation