CURRICULUM VITAE

KENNETH R. LUTCHEN

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EDUCATION

University of Virginia	*B.S. Engineering Science*
Case Western Reserve University	*M.S. Biomedical Engineering*
Case Western Reserve University	*Ph.D. Biomedical Engineering*

ACADEMIC LEADERSHIP POSITIONS

2025 – present	Vice President and Associate Provost for Research	*Boston University*
2024-2025	Senior Advisor to President: Strategy & Innovation	*Boston University*
2023-2024	Provost, Chief Academic Officer, interim	*Boston University*
2006-2023	Dean, College of Engineering	*Boston University*
1998-2006	Chair, Biomedical Engineering	*Boston University*
2010-2013	President, American Institute for Medical and Biological Engineering (public policy advocacy organization representing >35,000 Bioengineers)	

RESEARCH PUBLICATION SUMMARY

- **152 peer reviewed journal articles or book chapters** published, in press, or submitted.
- **~10,200 Citations, h-index 55**, Over 130 papers cited 10 times or more each (Google Scholar)

KEY RESPONSIBILITIES AS VICE PRESIDENT OF RESEARCH

- Leading BU's $580 million research enterprise comprised of BU's 17 Schools and Colleges including the Medical School campus. BU has 130 centers and institutes and more than 1,500 laboratories.
- Oversees Offices of Sponsored Research, Compliance and Regulation, Technology Transfer, Industry Engagement, Research Development, and all University level Research Centers and Institutes
- Leads creation and implementation of university-wide research strategy including serving as the Co-Chair of the Task Force on Convergent Research and Education.

KEY RESPONSIBILITIES AND ACCOMPLISHMENTS AS PROVOST, *ad interim*

- Oversaw $3 Billion Academic Budget for over 11,000 faculty and Staff, inclusive of 17 separate Schools and Colleges (17 Dean Direct Reports) and 18 University Wide Administrative Units led by Associate Provosts, Vice Presidents for a total of 36 Direct Reports, including Enrollment and Student Affairs, Officer of Research, the University Libraries, Undergraduate and Graduate Affairs, BU Virtual for On-line at Scale, Faculty Affairs, Global Programs, Community and Inclusion and more.
- Enhanced budgetary practices driven by local and institutional strategic priorities including mentoring income generating practices at level of schools and colleges.
- Stood up a "AI in Education and Research Taskforce" to assess/advise on the future impact of genAI on institutional mission.
- Created University-wide Student Testing Center to insure dignity and effectiveness of accommodating students with disabilities.

- Refreshed University Strategic Plan with mission narrative for providing exceptional value to society.
- Initiated University-Wide approach for Holistic and Personalized Student Advising.
- Oversaw University-Wide Response to first-ever Belonging & Culture Survey.
- Began restructuring to enhance university-wide revenue from professional master's programs.

KEY ACTIVITIES AS PRESIDENT'S SENIOR ADVISOR FOR STRATEGY & INNOVATION

- Oversaw the design and serving as the inaugural Executive Director of a new organizational structure called AI Development Accelerator (AIDA) for Excellence in Academics and Administration. AIDA will coordinate and support how AI will transform the educational mission, research success, and administrative efficiencies ranging from student outcomes to operations.
- Chair, Taskforce on Convergent Research and Education. Overseeing a new strategic approach for advancing the power of collaboration and convergence as a guiding principle to create holistic citizens and to advance university-wide convergent research-themes that will address society's grand challenges.
- Initiating the process of transforming undergraduate student advising and mentoring to enhance retention and graduation rates.

KEY RESPONSINILITIES AND ACCOMPLISHMENTS AS DEAN of ENGINEERING

- Oversaw ~$200 million budget to advance continuous innovation and excellence for 1800 undergraduates 1200 graduates, 150 full-time faculty and 700 staff; Advanced budget practices at college and program level to optimize revenue and reduce expenditures. Responsible for education and research space-allocation and planning throughout entire College.
- Headed Leadership team consisting of 12 direct reports inclusive of academic program leaders, Associate Deans for Research & Faculty Development, Academic Programs, Educational Strategic Initiatives, Administration, Outreach& Diversity, and Research Administration.
- Restructured the College resulting in more flexibility in faculty recruiting to advance distinctive excellence in education and research, especially at the intersection of multiple disciplines.
- Designed and built research administration team to support major center-like proposals. College went from one to five PhD Training Grants from NSF and NIH.
- Oversaw the creation of new research centers including **Biological Design Center**; **Precision Diagnostics Center**; **Neurophotonics Center.**
- Mentored lead on **$40M NSF Engineering Research Center** (2017).
- Conceived and implemented concept and vision for **Creating the Societal Engineer** as guiding principal of our mission. *Concept received Trademark from US Patent Office.* See: http://www.bu.edu/eng/about/boston-university-creating-the-societal-engineer/
- Extramural research expenditures increased from $30 million per year to $95 million including all sources. PhD graduates per year increased from 40 to ~100/year. College of Engineering
- **Graduate Ranking Improved** from 54 (2006) to top 27st **(**15th among all Private Colleges**)**

- Lead the **College's Capital Campaign to exceed 100% of original Campaign goal 4.5 years into a 7-year campaign**. Resulted in nearly **1000% increase in Engineering Annual Fund gifts.**
- Oversaw the conception, fund-raising, and creation of unique hands-on facilities to support experiential education and create deep partnerships with industry for workforce. These include:
    - **Engineering Product Innovation Center (EPIC),** a 15,000 sq. ft. Maker space which transforms engineering and design education
    - **Bioengineering Teaching and Entrepreneurship Center (BTEC)** with a Cell and Tissue Facility, Sensor and Instrumentation Facility, and a Digital Medicine Suite.
    - **Robotics and Autonomous Systems Teaching and Innovation Center (RASTIC)** to facilitate Industry-BU partnerships for supplying Robotics workforce for MA.

- Spearheaded several major Educational Innovations:

- Conceived **transformation to ensure that *all* undergraduate engineering programs prepare engineers for the data-driven economy** via incorporating data science throughout all majors. (http://www.asee-prism.org/new-core-values/
- **Created new Interdisciplinary Graduate Division of Materials Science and Engineering and new Division of Systems Engineering**, in partnership with Physics, Math, Chemistry and Computer Science and Business School.
- **Created new professional Master's Degree Programs** across the college resulting in **$15-20 Million of new income per year.**
- Catalyzed **Concentration in Technology Innovation with School of Business** to educate engineering students on how innovations become commercialized products.

MAJOR ACCOMPLISHMENTS AS CHAIR OF BIOMEDICAL ENGINEERING

- Built 2nd largest Biomedical Engineering Department in the nation (38 primary faculty, $700K/faculty in research expenditures, 500 PhD students)
- **Department Ranking Improved from 20th to 6th** in US News and World Report.
- Principal Investigator and chief architect of a **$14 million dollar Leadership Award** from the Whitaker Foundation, one of only three ever given, & **$5 million-dollar Translational Biomedical Engineering Research Award** from the Wallace H. Coulter Foundation.
- Principal Investigator/Author on BME department's **first ever NIH Pre-Doctoral Graduate Student Training Grant** in Quantitative Biology and Physiology. Grant is now in its 25-30th years.

MAJOR PROFESSIONAL HONORS & RECOGNITION

2025	Elected Fellow of American Association for the Advancement of Science (AAAS)
2024	Gold Medal Alumni Award, Case Western Reserve University (highest honor)
2023	Plenary Lecture, National Institute of Biomedical Imaging and Bioengineering
2021	Identified in top 0.28% of experts in Respiratory Mechanics: https://expertscape.com/au/respiratory+mechanics/Lutchen%2C+Kenneth+R
2019	Elected a Fellow of the International Academy of Medical and Biological Engineering (IAMBE)
2016-19	Advisory Committee; Directorate for Engineering of the National Science Foundation
2014	Pierre Galletti Award ($10,000): Highest honor the American Institute for Medical and Biological Engineering (AIMBE) bestows upon an individual for career impact on the field of Medical and Biological Engineering
2015 -22	Chair, Study Section for NIBIB Team-Based Design in Biomedical Eng. Educ.
2010 - 15	NIH-NHLBI: Member, Resp. Integ. Biol. & Translational Research Study Section
2010 - 13	Elected President of American Institute for Medical and Biological Engineering
2005	Elected as Biomedical Engineering Society Fellow (Inaugural Class)
2003 - 06	NIH-NIGMS Biomedical Research and Research Training (BRT) Study Section
Elected 1999	AIMBE (American Institute for Medical and Biological Engineering) Fellow
Elected 1999	President, Council of Chairs of Biomedical Engineering and Bioengineering
1992 – 1995	Board of Directors, Biomedical Engineering Society
1990	Professor of the Year, College of Engineering, Boston University
2009	Namesake of the **Kenneth R. Lutchen Summer Research Fellowships**, a $100,000/yr funded by an endowment created by an anonymous donor

MAJOR ADVISORY BOARDS

2024-	Board of Trustees, University of Virginia Engineering Foundation
2016-19	Advisory Committee; Directorate for Engineering of the National Science Foundation
2010 -	Board of Directors, Wyss Institute for Bioinspired Engineering, Harvard University
2016 -	Board of Directors, BetaBionics, Inc.
2012	Advisory Board, College of Engineering and Applied Science, George Washington U.
2012	National Science Foundation: Advisory Board: Cyberphysical Systems and Healthcare
2011	Selection Committee, Whitaker International Fellows Program

2010 -	Scientific Advisory Board, Tufts University, School of Engineering
2005 - 2023	Dean's Advisory Council, Case Western Reserve University
2002 - 06	Scientific Advisory Board, Asthma Research Center, Brigham and Women's Hosp.

HIGHER EDUCATION COMMENTARY PIECES

University-Corporate Research Relationships

- A New Model for University-Industry Partnerships | Harvard Business Publishing Education Harvard Business Review Education. April 2024
- How Companies Can Help Universities Train Tech Workers (hbr.org), Harvard Business Review (on-line) Jan. 2024
- https://hbr.org/2018/01/why-companies-and-universities-should-forge-long-term-collaborations "**Why Companies and Universities Should Forge Long-Term Collaborations**" Harvard Business Review (on-line) Op-Ed
- https://chiefexecutive.net/seven-ways-company-research-university/ **Seven Ways Your Company Can Partner With A Research University.** Chief Executive.Net, August 27, 2018
- http://www.asee-prism.org/last-word-mar-apr-6/ Better Corporate Partnerships Create a Better-Prepared Workforce" ASEE Prism Magazine: Last Word, March 2021

Inspiring Engineering Careers

- http://fortune.com/2016/05/22/women-stem **"This is the Best Major for Wannabe CEO: Securing the Future of America's Leadership in Innovation".** Fortune Magazine Commentary. 2016. We need to inspire a more diverse group of US Citizens to pursue engineering. Here are some examples of how to do so.

University-Corporate Partnerships for Technology Transfer

- http://podcasts.aaas.org/science_transl_med/ScienceTranslMed_111123.mp3; & Lutchen, K. J. et. al.; Engineering Efficient Technology Transfer. Science Translational Medicine, Vol. 3;

SELECTED FUNDING HISTORY (PI unless indicated otherwise)

- **R01: A multi-scale computational model of the extracellular matrix of the lung**
  Agency: **National Institute of Health**
  Duration of Grant: 5/01/18 – 4/30/23
  Role (Co-Investigator)
  Total Costs: $4,013,796
- **R01: Factors Determining Hyperresponsiveness in Intact Airways**
  Agency: **National Institute of Health**
  Duration of Grant: 4/01/10 – 3/31/16
  Total Costs: $1,913,235
- **PhD Training Program in Quantitative Biology and Physiology**
  Agency: **National Institute of Health**
  Duration of Grant: 7/1/06 – 6/30/11
  Total Costs: $3,934,158
- **R01: Airway Reactivity and Heterogeneity in Asthma**
  Agency: **National Institute of Health**
  Duration of Grant: 2/15/05 – 1/31/11
  Total Costs: $2,228,512
- **Translational Research Partnership in Biomedical Engineering**
  Agency: **The Wallace H. Coulter Foundation**
  Duration of Grant: 1/1/05 – 1/1/10
  Total Costs: $2,900,000
  Grant will Accelerate Transition BME Research to Patients
- **Cell and SubCellular Based Biomedical Engineering**
  Agency: **The Whitaker Foundation**
  Duration of Grant: 7/1/01 – 6/30/06
  Total Costs: $ 32,845,047, Amount Awarded from Whitaker Foundation: $14,000,000
  Grant Enhanced Education and Research in Biomedical Engineering at the Charles River and Medical School Campuses of Boston University
- **Training Program in Quantitative Biology and Physiology**
  Agency: **National Institute of Health**
  Duration of Grant: 7/1/01 – 6/30/06
  Total Costs: $1,279,098
- **A New Paradigm in Mechanical Ventilation**
  Agency: **National Science Foundation: GOALI**
  Duration of Grant: 7/1/00 – 6/30/04
  Total Costs: $382,847
- **R01: Role of Inflammation on Airway Constriction in Asthma**
  Agency: **National Institute of Health**
  Duration of Grant: 4/1/99 – 3/31/04
  Total Costs: $1,248,259

PEER REVIEWED PUBLICATIONS

Journal Articles Published or In Press

1. Lutchen, K.R., F.P. Primiano,Jr., and G.M. Saidel. A nonlinear model combining pulmonary mechanics and gas concentration dynamics. *IEEE: Trans. Biomed. Eng.* (29), 629-641, 1982.

2. Lutchen, K.R. and G.M. Saidel. Sensitivity analysis and experimental design techniques: application to nonlinear dynamic lung models. *Comp. and Biomed. Res.* (15), 434-454, 1982.

3. Lutchen, K.R., G.M. Saidel, and J.G. Horowitz. Nonuniform mechanics and gas mixing in normal human lungs: inadequacies of parallel compartment models. *Advances in Bioengineering*, Amer. Soc. Mech. Engs., 473-476, 1983.

4. Lutchen, K.R., G.M. Saidel, F.P. Primiano, Jr., J.G. Horowitz, and E.C. Deal Mechanics and gas distribution in normal and obstructed lungs during tidal breathing. *Amer. Rev. Respir. Dis.* (130), 974-979, 1984.

5. Swidwa, D.M., H.D. Montenegro, M.D. Goldman, K.R. Lutchen, and G.M. Saidel, Helium-oxygen breathing in severe chronic obstructive pulmonary disease. *Chest* (87), 790-795. 1985.

6. Jackson, A.C. and K.R. Lutchen, Modeling of respiratory system impedances in dogs. *J. Appl. Physiol.* 62:414-420, 1987.

7. Lutchen, K.R. and G.M. Saidel. Evaluation of mechanical parameters in multi-compartment models applied to normal and obstructed lungs during tidal breathing *IEEE: Trans. Biomed. Eng.* vol. 33 (9), 878-887, 1986.

8. Lutchen, K.R. and A.C. Jackson. Statistical measures of parameter estimates from models fit to respiratory impedance data: emphasis on joint variabilities. *IEEE: Trans. Biomed. Eng.* vol. 33 (11), 1000-1010, 1986.

9. Lutchen, K.R. and A.C. Jackson. Reliability of parameter estimates from models applied to respiratory impedance data: importance of higher frequencies. *J. Appl. Physiol.* 62:403-413, 1987.

10. Jackson, A.C., K.R. Lutchen, and H.L. Dorkin. Inverse modeling of dog airway and respiratory system impedances. *J. Appl. Physiol.* 62:2273-2282, 1987.

11. Dorkin, H.L., K.R. Lutchen, and A.C. Jackson. Human input impedance from 4-200 Hz: Physiological and modeling implications. *J. Appl. Physio*l. 64(2), 1988.

12. Lutchen, K.R. Optimal selection of frequencies for estimating parameters from respiratory impedance data. *IEEE Trans. Biomed. Eng.* 35(8). 1988.

13. Lutchen, K.R., Z. Hantos, A.C. Jackson. Importance of low frequency impedance data for reliably quantifying parallel inhomogeneities of respiratory mechanics. *IEEE Trans. Biomed. Eng.* 35 (6), pp. 472-481, 1988

14. Lutchen, K.R. Use of sensitivity and optimal experiment design for estimating mechanical parameters in respiratory system models. In Modeling and Control in Biomedical Systems, ed. C. Cobelli, L. Mariani, Pergamon Press, New York, 473-478, 1989.

15. Lutchen, K.R. and Jackson, A.C., Effects of tidal volume and methacholine on low frequency total respiratory impedance in dogs. *J. Appl. Physiol.* 68, 2128-2138, 1990.

16. Lutchen, K.R.; Guirdenella,C; and Jackson, A.C.. Inability to separate airway from tissue properties using input impedance in humans. *J. Appl. Physiol.* 68, 2403-2412, 1990.

17. Lutchen, K.R.; Habib, R.H; Dorkin,H.L.; and Wall, M.. Relation of respiratory impedance to a multibreath nitrogen washout in healthy, asthmatic and cystic fibrosis subjects. *J. Appl. Physiol.* 68, 2139-2149, 1990.

18. Lutchen, K.R. Sensitivity analysis of respiratory parameter uncertainties: Impact of criterion function form and constraints. Modeling Methodology Forum, *J. Appl. Physiol* 69(1), 766-775, 1990.

19. Lutchen, K.R.; Costa, K.D.; Physiological behavior of lumped parameters estimated from respiratory impedance data: use of forward inverse modeling. *IEEE Trans. Biomed. Eng.* 11, 1076-1086, 1990.

20. Jackson, A.C. and Lutchen, K.R. Physiological basis for resonant frequencies in respiratory impedances in dogs. *J. Appl. Physiol* 70: 1051-1058, 1991

21. Davis, K.A.; Lutchen, K.R. Respiratory impedance spectral estimation for digitally created random noise. *Annls Biomed. Eng.* 19, 179-195, 1991

22. Davis, K.A.; Lutchen, K.R. Time series versus Fourier transform methods for estimation of respiratory impedance spectra. *Int. J. Biomed. Comput.* 27, 261-276, 1991.

23. Lutchen, K.R. Impact of joint variability, weighting, and parameter nonlinearities on impedance parameter estimates. *Eur. Respir. Rev.* (1) rev 3, 210-215, 1991

24. Habib, R., and Lutchen, K.R. Moment analysis of a multibreath nitrogen washout based on an alveolar gas dilution number. *Amer. Rev. Resp. Dis.* 144:513-519, 1991.

25. Barnas, G.M., D. Stamenovic, K.R. Lutchen, and C.F. Mackenzie. Lung and chest wall impedances in dog in the normal range of breathing: effects of frequency and tidal volume. *J. Appl. Physiol.* (1), 87-93, 1992.

26. Lutchen, K.R. and A.C. Jackson. Confidence bounds on respiratory mechanical properties estimated from transfer vs input impedance in humans versus dogs. *IEEE Trans. Biomed. Eng.* (39) 6, 644-651, 1992.

27. Barnas, G.M., D. Stamenovic, and K.R. Lutchen. Lung and chest wall impedances in the normal range of breathing: effects of pulmonary edema. *J. Appl. Physiol.* 73(3), 1049-1056, 1992.

28. Suki, B. and K.R. Lutchen. Pseudorandom signals to estimate apparent transfer and coherence functions of nonlinear systems: applications to respiratory mechanics. *IEEE Trans. Biomed. Eng.* 39(11), 1142-1151, 1992

29. Lutchen, K.R., J.R. Everett and A.C. Jackson. Influence of frequency range and input impedance on interpreting the airways tissue separation implied from transfer impedance *J. Appl. Physiol.* 73(3), 1089-1099, 1993.

30. Lutchen, K.R., K. Yang., D. W. Kaczka, B. Suki. Optimal ventilation waveforms for estimating low frequency respiratory impedance in healthy and diseased subjects. *J. Appl. Physiol.* 75(1):478-488, 1993.

31. Stamenovic, D., K.R. Lutchen, and G.M. Barnas. An alternative model of the respiratory tissue viscoplasticity. *J. Appl. Physiol.* 75 (3):1062-1069, 1993.

32. Lutchen, K.R. , D. W. Kaczka, B. Suki, G.M. Barnas, G. Cevenini, and P. Barbini,. Low frequency respiratory mechanics using ventilator-driven forced oscillations. *J. Appl. Physiol.* 75(6): 2549-2560, 1993.

33. Barbini, P., G. Cevenini, K. Lutchen, and M. Ursino. Estimating respiratory mechanical parameters of ventilated patients: A critical study in the routine intensive care unit. *Med. Biolog. Comput.* (32): 153-160, 1994.

34. Lutchen, K.R., B. Suki, D. Kaczka, Q. Zhang, Z. Hantos, B. Daroczy, F. Petak. Direct use of mechanical ventilation to measure respiratory mechanics associated with physiological breathing conditions. *Eur. Respir. Rev.* 19: 198-202, 1994.

35. Hantos, Z. F. Petak, A. Adamicza, B. Daroczy, B. Suki, and K.R. Lutchen. Optimum ventilator waveform for the estimation of respiratory impedance: an animal study. *Eur. Respir. Rev.* 19: 191-197., 1994.

36. Barnas, G.M., P. Harinath, M. Green, B. Suki, D.W. Kaczka, and K.R. Lutchen. Influence of waveform and analysis technique on lung and chest wall properties in the physiological range. *Respir. Physiol.* 96: 331-344, 1994.

37. Lutchen, K.R., B. Suki, and Q. Zhang. Optimal design of inputs for identifying linear and nonlinear pulmonary mechanical properties. (review article) *IFAC Symposium on Modeling and Control in Biomedical Systems.*, 521-526, 1994

38. Suki, B. A-L Barabasi, and K.R. Lutchen. Lung tissue viscoelasticity: a mathematical framework and its molecular basis. *J. Appl. Physiol.* 76(6), 2749-2759, 1994.

39. Lutchen, K.R., B. Suki, Q. Zhang, F. Petak, B. Daroczy, and Z. Hantos. Airway and tissue mechanics during physiological breathing and bronchoconstriction in dogs. *J. Appl. Physiol.* 77(1), 373-385, 1994.

40. Christini, D.J., F.M. Bennett, K.R. Lutchen, H.M. Ahmed, J.M. Hausdorff, and N. Oriol. Linear and nonlinear time series modeling of heart rate dynamics. *IEEE Trans. Biomed. Eng.* vol 42, No. 4, 411-415,1995.

41. Kaczka, D.W., B. Suki, G.M. Barnas, K.R. Lutchen, Assessment of time-domain analysis for estimation of low frequency respiratory mechanical properties and impedance spectra. *Annls. Biomedical Eng.* 23: 135-151, 1995.

42. Christini, D.J., A. Kulkarni, S. Rao, E. Stutman, F.M. Bennett, J.M. Hausdorff, N. Oriol, K.R. Lutchen, Influence of autoregressive model parameter uncertainty on spectral estimates of heart rate dynamics. *Annls. Biomedical Eng.* 23:127-134, 1995.

43. Suki, B., Q. Zhang., and K.R. Lutchen. Relationship between frequency and amplitude dependence in the lung: a nonlinear block-structured modeling approach. *J. Appl. Physiol.* 79(2), 660-671, 1995.

44. Zhang, Q., B. Suki, and K.R. Lutchen. An extended harmonic distortion index to quantify system nonlinearities from broadband inputs: application to lung mechanics. *Annls. Biomedical Eng.* 23: 672-681, 1995.

45. Suki, B., F. Petak, A. Adamicza, Z. Hantos, and K.R. Lutchen. Partitioning of airway and lung tissue properties from lung input impedance: comparison of in situ and open chest conditions. *J. Appl. Physiol.* 79(2): 660-671, 1995.

46. Lutchen, K.R., J.L. Greenstein, B. Suki. How inhomogeneities and airway walls affect frequency dependence and separation of airway and tissue properties. *J. Appl. Physiol.* 80(5), 1696-1707, 1996.

47. Lutchen, K.R., Z. Hantos, F. Petak, A. Adamicza, B. Suki. Airway inhomogeneities contribute to apparent lung tissue resistance during constriction. *J. Appl. Physiol* 80(5), 1841-1849, 1996.

48. Jackson, A.C., K.M. Neff, H.L. Dorkin, and K.R. Lutchen. Interpretation of respiratory impedance measurements of healthy infants. *Pediatric Pulmonology.* 22:364-375, 1996.

49. Suki, B., H. Yuan, Q. Zhang, and K.R. Lutchen. Partitioning of lung tissue response and inhomogeneous airway constriction at the airway opening. *J. Appl. Physiol* 82: 1349-1359, 1997.

50. Kaczka, David. W., E.P. Ingenito, B. Suki, and K.R. Lutchen. Partitioning of airway and lung tissue resistance in humans: effects of bronchoconstriction. *J. Appl. Physiol* 82: 1531-1541, 1997.

51. Suki, B., F. Petak, A. Adamicza, B. Daroczy, K.R. Lutchen, and Z. Hantos. Airways and lung tissues are more sensitive to methacholine in closed chest than in open chest dogs. *Resp. Physiol* 1997.

52.Lutchen, K.R. and H. Gillis. The relation between airway morphometry and lung resistance and elastance during constriction: A modeling study. *J. Appl. Physiol.* 83 (4), 1997.

53. Yuan, H. B. Suki, and K.R. Lutchen. Sensitivity analysis for evaluating nonlinear models of lung mechanics. *Annls. Of Biomedical Eng.* 26: 230-241, 1998

54. Zhang, Q., B. Suki, D. Westwick, and K.R. Lutchen Factors affecting kernal estimation: emphasis on lung tissue viscoelasticity. *Annls. Of Biomedical Eng.* 26: 103-116, 1998.

55. Lutchen, K.R. A. Sullivan, F.T. Arbogast, B.R. Celli, and A.C. Jackson. Use of transfer impedance measurements for clinical assessment of lung mechanics. *Amer. J. of Resp. and Crit. Care Medicine.* 157, 435-446, 1998.

56. Westwick, D., B. Suki, and K.R. Lutchen. Sensitivity analysis of kernal estimates: implications to identification of nonlinear physiological systems. *Annls. Of Biomedical Eng.* 26, 488-501, 1998..

57. Zhang, Q., K.R. Lutchen, B. Suki. A frequency domain approach to nonlinear and structure identification for long memory systems: application to lung mechanics. *Annls. Of Biomedical Eng.* 27: 1-13, 1999.

58. Suki, B. A.M. Alencar, M.K.Sujeer, KR Lutchen, JJ Collins, J.S.Andrade, EP Ingenito, S. Zapperi, and H.E. Stanley. Tuning noise for optimal mechanical ventilation. *Nature* 393, 127-128, 1998.

59. Kaczka, D.,W., E.P. Ingenito, E. Israel, and K.R. Lutchen. Airway and tissue mechanics in asthmatics: effects of albuterol *Amer. J. of Resp. and Crit. Care Medicine* 159: 169-178, 1999.

60. Yuan, H. D.T. Westwick, E. P. Ingenito, K.R. Lutchen, and B.Suki. Parametric and nonparametric nonlinear system identification of lung tissue strip mechanics. *Annls. Of Biomedical Eng.* 27(4), 548-562, 1999.

61. Gillis, H., and KR Lutchen. How heterogeneous bronchconstriction affects ventilation and pressure distributions in human lungs: a morphometric model. *Annls. Of Biomedical Eng.* 27: 14-22, 1999.

62. Gillis, H.L. and K.R. Lutchen. Airway remodeling in asthma amplifies heterogeneous smooth muscle shortening causing hyperresponsiveness. *J. Appl. Physiology* 86:2001-2012, 1999.

63. Kaczka, D.W. E.P. Ingenito, and K.R. Lutchen. A technique to determine inspiratory impedance during mechanical ventilation: implications for flow limited patients. *Annls. Of Biomedical Eng.* 27: 340-355, 1999.

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65. Westwick, D.T., and K.R. Lutchen Fast orthogonal identification on nonlinear systems using impicit basis expansion.. *Annals Biomedical Eng.* 28: 2000.

66. Kaczka, D.W., E.P. Ingenito, S.C. Body, S.E. Duffy, S.J. Mentzer, M.M. DeCamp, and K.R. Lutchen. Effects of PEEP and lung volume reduction surgery on inspiratory lung impedance in patients with chronic obstructive pulmonary disease. *Journal of Applied Physiology* 90: 1833 – 1841, 2001.

67. Lutchen, K.R., D.W. Kaczka, E. Israel, B. Suki, E.P. Ingenito. Airway constriction pattern is a central component of asthma severity: the role of deep inspirations. *Amer. J. of Resp. and Crit. Care Medicine* 164: 207-215, 2001.

68. Sakai, Hiroaki, E.P. Ingenito, R. Mora, S. Abbay, F. Cavalcante, K.R. Lutchen, and B. Suki. Hysteresivity of the lung and tissue strip in the normal rat: effects of heterogenieties. *J. Appl. Phhysiology* 91: 737-747, 2001.

69. Latorurelle, J.C., and H.L. Gillis, K.R. Lutchen. Exact morphometric modeling of rat and human lungs for predicting mechanical impedance. *Respiration Physiology* 127: 75-85, 2001.

70. Jenson, A., H. Atilah, B. Suki, E. Ingenito, Lutchen K.R. Airway caliber in healthy subjects and asthmatics: effects of deep inspirations and bronchial challenge. Highlighted Topics: Signal transduction in Smooth Muscle: *J. Appl. Physiol.* 91: 506-515, 2001.

71. Barbini, P. G. Cevenini, F. Bernardi, M.R. Massi, and K.R. Lutchen. Influence of inspiratory-expiratory ratio on total resistance estimate in simulated mechanical ventilation, *Medicon* 2001.

72. Arold, Stephen P., Mora, Rene, Lutchen, K.R., Ingenito, Edward P., Suki, Bela. Variable Tidal Volume Ventilation Improves Lung Mechanics and Gas Exchange In a Rodent Model of ALI. *Am. J. Respir. Crit. Care Med.* 165, 366-371, 2002.

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Books and Book Chapters

1. Béla Suki and Kenneth R. Lutchen , "*Lung tissue viscoelasticity: from extracellular matrix complexity to constitutive equations"*; Handbook of Biomedical Engineering, 2005.

2. Lutchen, K.R. and B. Suki, *"Understanding Pulmonary Mechanics Using the Forced Oscillation Technique: Emphasis on Breathing Frequencies"* Chpt. 15, pgs 227-253 in Bioengineering Approaches to Pulmonary Physiology., Plenum Press, Edited by Michael Khoo, 1996.

3. Lutchen, K.R., and H.F. Voigt, Guest Editors, Abstracts for 1995 BMES Meetings. Annals of Biomedical Engineering, Vol. 23, No. 4, 1995.

INVITED TALKS

The Heroic Role of Bioengineering in Society and Medicine. Plenary Lecture, National Institute of Biomedical Imaging and Bioengineering, Biomedical Engineering Society, Seattle, WA 2023

Bioengineering as a Role Model for How Convergence Will Advance Society's Grand Challenges and Opportunities. Keynote Speaker. IAMBE and Carnigie Melon Forum on Biomedical Engineering, 2020.

The Value Proposition of Higher Education. The A.C. Suhren Lecture. Tulane University, New Orleans, LA. January 2019.

Potential Impact & Need of Disruptive Innovations to Impact Grand Challenges in Medicine. Introductory Address. Turkish American Scientist and Scholars Association. Boston, MA, June 1, 2018.

The Challenge & Opportunities of BME and Engineering Education. Department of Biomedical Engineering, Northeastern University, Dec, 2017.

How Can the National Science Foundation Stimulate Junior Faculty to Pursue Higher Impact Research Connected to Society's Major Challenges?" NSF Germination Workshop Invited Panellist, Washington DC, May 2016.

How Does the Lung Become Asthmatic?; Department of Biomedical Engineering, Northeastern University, Dec, 2017.

Relating Higher Education and Research to the Impact of Bioengineering on Societies Grand Challenges in Healthcare. Distinguished Keynote Speaker at Institute for Engineering and Medicine Annual Event , Univ. Minnesota, Sept 26, 2016

Creating the K-12 STEM Teacher for the Future to Inspire Careers in Innovation" 100Kin10 Speaker at White House; November 2015.

"What are the Structural Changes in the Lung Necessary to Create Human Asthma?" Tufts University, October 14, 2013

"Why do Asthmatics have Hyperresponsive Airways?: Understanding the Whole Lung Response in the Context of its Parts." Dartmouth College**,** March 1, 2013

"**Structural Versus Functional Defects in Asthma: How the Whole Emerges from the Sum of the Parts".** Distinguished Lecturer, University of California Riverside, BioEngineering. April 3, 2013

"Challenges and Opportunities for Advancing our Medical and Biological Engineering Ecosystem?" Presidential Address, American Institute of Medical and Biological Engineering 21st Annual Event., February 2012.

"**Technology Translation**" Science Translational Medicine Podcast: 23 November 2011. http://podcasts.aaas.org/science_transl_med/ScienceTranslMed_111123.mp3

"Invited Session Chair/Speaker: Computational Modeling of the Lung: What Can they Accomplish?" American Thoracic Society Meeting, Denver, CO, May, 2011.

"Synthesizing Imaging and Structural Models to Probe Airways and Airway Structures Responsible for Asthma" Keynote Speaker 1st International Conference on Mathematical and Computational Biomedical Engineering; June 29 – July 1, 2009, Swansea, UK

"Creating and Educational Experience for Engineers: Focus on Bioengineering" Key Speaker, 3rd Annual Engineering Science Education Conference, University of Toronto, Jan. 18, 2008.

"The Forced Oscillation Technique in Asthma" Scientific Symposium on Oscillation Mechanics of the Respiratory System: Basic Research to Clinical Application. American Thoracic Society, San Francisco, CA, May 21, 2007.

Airway Hyperreactivity: From Whole Lung to Isolated Airways and Smooth Muscle and Back Again". Symposium on the Pathophysiology of Asthma, Antigua, November 20-22, 2006

"Understanding Structure vs Function Relations in Asthma: How the Whole Emerges from the Sum of the Parts". McGowen Institute for Regenerative Medicine, Univ. of Pittsburgh, October 5, 2006

"Structure-Function Relations Governing Airway Hyperreactivity in Asthma". Dept. Biomedical Engineering, Mayo Clinic, Rochester, MN August 18, 2006

"The Coulter Foundation Translational Research Partnership in Biomedical Engineering at Boston University: Catalyzing and Accelerating Innovation". Mass. Medical Society (MassMEDIC) Conference: Working with Academic Research Institutions. May 25, 2006.

"Multi-scale Image Functional Modeling of the Lung". Dept. Biomedical Engineering, Case Western Reserve University, Keynote Speaker for Alumni Reunion Weekend for BME, Oct. 15, 2005..

"Integrating Multi-Scale Modeling with Imaging to Distill Structure-Function Relations in Asthma". Dept. Biomedical Engineering, University of Pennsylvania, Philadelphia, PA, Sept. 22, 2005.

"The Coupling Between Airway Smooth Muscle Length and Lung Volume". Workshop on Airway Smooth Muscle: From Cell to Organ", American Thoracic Society, May 2005.

"Probing the Origins of Airway Dysfunction in Asthma via Multi-scale Image Functional Modeling". Biomedical Engineering, Tufts University, April 8. 2005.

"Building an Exciting Biomedical Engineering Department". Plenary Talk, Whitaker Foundation Educational Summit, Lansdowne Center, Washington, March 6, 2005.

"Multiscale Image Functional Modeling of the Lung: From Basic Science to Clinical Practice in Asthma and Respiratory Distress Syndrome". Biomedical Engineering, Univ. of California Irvine. Irvine, CA, Feb. 2005.

"Heterogeneity and Integrated Lung Function in Asthmatic Humans: Is the whole greater than the sum of the parts" Symposium on Lung Reactivity and Structure, American Thoracic Society Meeting, Orlando, FL, May 26, 2004.

Understanding the Integrative Structure-Function Pathology of Asthma: Inflammation to Clinical Phenotype" Dept. Molecular and Cellular Biology, Goldman School of Dentistry, Boston, MA., Jan. 29, 2004.

"The Interface Between Computational Modeling of the Lung and Clinical Practice" Vermont Lung Center, University of Vermont, Nov. 18, 2003.

"Airway Hyperreactivity and Heterogeneity: Is the Whole greater than the sum of the parts?" Flow Volume Underworld, Grand Isle, Vermont, Sept. 11, 2003.

"The Mechanical Phenotype of Asthma: Airway Inflammation, Heterogeneity, and Airway Reactivity" Dept.. Bioengineering, Politecnico di Milano, Milano, Italy. April 2, 2003.

"Heterogeneity of Airway Constriction and Airway Hyperreactivity in Asthma" Plenary Tallk, 20th Veterinary Comparative Respiratory Society, Boston, MA, October 4, 2002.

"Heterogeneity and Lung Function: Airway and Tissue Disease" Department of Anesthesiology, Johns Hopkins University. July 10, 2002.

"Where is the locus of the functional defect in asthma?: Tracking Airway Diameter and Smooth Muscle Stretch In Situ". Department of Biomedical Engineering, University of Virginia, September, 28, 2001.

"Senior Design in Biomedical Engineering." Moderator and Key Speaker, Special NSF Panel on Undergraduate Design in Bioengineering, National Science Foundation, Arlington, VA, June 28-29, 2001.

"Structure/Function Relationships in the Lung Associate with Asthma." Biomedical Science and Engineering Seminar Series, Shriners Burns Hospital of Mass General Hospital, Boston, MA, March 20, 2001.

"An Engineering Systems Approach to Probing Lung Structure and Function in Asthma." Biomedical Engineering Department, Bucknell University, Lewisberg, PA, February 22, 2001.

"Combining Systems Engineering and Structural Modeling to Understand Asthma." Marquette University, Biomedical Engineering, February 9, 2001.

"Structure-Function Relations Governing Airway Hyperactivity in Asthma" Flow Volume Underworld, Genoa, Italy, September 4, 2000.

"Probing Structure-Function Relations in the Lung Using Forced Oscillations" Center for Sleep Disorders, Harvard Medical School, Brookline, MA, June 12, 2000.

"Computational Challenges to Probing Structural and Integrative Lung Phenotypes" Invited Speaker at Computational Challenges in the Post-Genomic Age Conference in San Fransisco, CA May 11, 2000.

"Morphological Modeling of Lungs: The virtual Human Project" National Academy of Sciences, Washington, DC., October 28, 1999.

"The Respiratory Mechanic" Invited lecturer for short course in oscillatory mechanics. University of Vermont, Burlington Vermont, October 24 and 25, 1999.

"Computational Advances in Morphometric Lung Models for Probing Structure-Function Relations in Lung Pathophysiology" Life Science and Computational Physics Sections of Oak Ridge National Laboratory, Oak Ridge, TN, July 13, 1999.

"Monitoring of Lung Mechanics During Mechanical Ventilation" Mallinckrodt, Inc.San Diego, CA, April 22, 1999

"How Important is the Pattern of Constriction in Establishing the Phenotype of Asthma" Pulmonary Division,
Vancouver Hospital, Canada, April 29, 1999.

"Probing Structure-Function Relations in the Lung: Implications on the Role of Inflammation in Asthma and on Lung Volume Reduction Surgury" Department of Biomedical Engineering, University of Virginia, Charlottesville, VA, Oct 1, 1998.

"From Research to Academics: Can a Research Institution train Senior Engineering Students for Independent Work at the Next Level?" National Science Foundation PI Conference for Undergraduate and Graduate Design Projects. Key Speaker, June 24, 1998

"On the Role of Heterogeneous Constriction in Establishing Lung Mechanical Function During Asthma" Harvard School of Public Health, Boston, MA, February 17, 1998.

"**Novel Methods to Track Lung Mechanical Properties During Breathing: Applications to Outpatient Asthma and Intubated Surgical Patients"** Boston Children's Hospital, Boston, MA. May, 1997.

"Lung Mechanics During Breathing: New techniques That Permit Inference on Lung Structural Status". Biotechnology and Bioengineering Research Center. University of Pittsburgh, December 13, 1996.

"Structural Origins of Changes in Resistance and Elastance in Diseased Lungs and Who Cares? " Meakin's Christie Laboratories of McGill University, Montreal, Quebec, Canada., September 10, 1996.

"**Assessment of Lung Mechanics During Mechanical Ventilation**" Nellcor Puriton Bennett Co, San Diego, CA, April 9, 1996.

"**How to Make Airways Look Like Tissues**". Meakin's Christie Laboratories of McGill University, Montreal, Quebec, Canada., October 17, 1995.

"Linear and Nonlinear Identification of Lung Mechanics". Dept. of Biomedcal Engineering; McGill University, Montreal, Quebec, Canada., October 18, 1995..

"The Forced Oscillation Technique for Probing Pulmonary Physiology" Portion of short course in Bioengineering Approaches to Pulmonary Physiology., Sponsored by the Biomedical Engineering Resource at USC. Seattle, WA, May 1995.

"BME Senior Project Design Program" Senior Design Workshop at Fall 1994 Biomedical Engineering Society Meeting, Tempe, Arizona. Sponsored by NSF and Whitaker Foundation. October 14, 1994

"A Capstone Senior Project as Part of an Integrated Design Experience for Biomedical Engineering Undergraduates" Amer. Soc. Eng. Educ., Edmonton, Canada, June, 1994

"Separating Airway and Tissue Mechanics In-Situ Using an Optimal Ventilator Waveform" Pulmonary Division of Baylor Medical Center, Houston, TX, March 1994.

"Optimal Input Design to Evaluate Linear and Nonlinear Mechanical Properties of the Airways and Respiratory Tissues" Key Speaker in Session on Respiratory Mechanics Systems Identification. IFAC Modeling and Control in Biomedical Systems., Galveston, TX, March 1994.

"Frequency and amplitude dependence of lung mechanical properties during bronchoconstriction and under physiological breathing conditions". Symposium on New Approaches to Evaluation of Lung and Chest Wall Function. American Thoracic Society Meetings, San Francisco, CA 1993.

"Direct Use of Mechanical Ventilation to Measure Respiratory Mechanics Associated With Physiological Breathing." Workshop on "Mechanical Airway Impedance, sponsored by Forced Respiratory Oscillation Group, Zeist, Netherlands, March 9, 1993.

"Respiratory Impedance From Low to High Frequencies: Physiological, Modeling and Clinical Implications". University of Siena, Siena, Italy. Nov. 6, 1991.

"Evaluation of Respiratory Mechanics at Low frequencies with Time and Frequency Domain Processing". Workshop on Asthma: Mechanics Mediators and Morphology, sponsored by the Centers for Excellence at the Meakin's Christie Laboratories of McGill University, Montreal, Quebec, Canada., May 26, 1991.

"Sensitivity of Respiratory Impedance to Peripheral Airway Disease as Implied from Nitrogen Washout and Low Frequency Data". Pulmonary Research Dept., University Ziekenhuizen Leuven, Belgium June 21, 1990.

"Respiratory Impedance Parameter Uncertainty Issues". Workshop on "Mechanical Airway Impedance, sponsored by Forced Respiratory Oscillation Group, Antwerp, Belgium, June 18-19, 1990.

"Low Frequency Impedance of the Dog Respiratory System". Respiratory Research Laboratory, Boston University, Boston, MA, April, 1989.

"Issues When Modeling of Respiratory Impedance." Department of Biomedical Engineering, Worchester Polytechnic Institute, Worchester, MA, Feb. 22, 1989.

"Inverse Modeling of the Respiratory Mechanical System: Application to Forced Oscillation Data from Humans." Department of Biomedical Engineering, University of Virginia, Charlottesville, VA, September 24, 1987.

"Forced Oscillations of the Respiratory System from 4-200 Hz." Harvard School of Public Health, Cambridge, MA, April 10, 1985.

"Preparing and Giving an Oral Presentation of Scientific Research." Given to NSF High School Research Program students. Department of Physics, Boston University, August 3, 1990.

EXAMPLE COMMENTARY PIECES IN BU ENGINEERING MAGAZINE

Educating Engineers

- Engineering's Gender Diversity Problem: Why does the most popular engineering discipline attract so few females?
- Educating the Maker Generation for the Digital Economy: The Days of the Single-Discipline Engineering Degree Have Passed
- The Hidden Value Proposition Via On-Campus Digital Learning: These new technologies have the potential to excite and engage students so they will be more likely to remain in science, technology, engineering and math fields.
- Putting MOOCs Where Our Mouths Are: Massive Open Online Courses aren't the educational nirvana some think they are, but they can play an important role in transforming engineering education.
- Engineering Education for the 21st Century: The technology leaders of tomorrow need more than what the classroom alone can offer.

STEM and K–12 Outreach

- We Can Build the Future: How we can get K–12 kids interested in engineering, retain engineering undergraduates and create Societal Engineers.
- Engineering Is Not Science: We need to excite kids about engineering and innovation, not just science.

Public Policy

- Partners in Innovation: A new model for academic-industry research partnerships.
- Society's Technology Gap: America's lack of basic technology knowledge threatens our future.
- Healthy Investing: Continued federal research support is critical to our economic prosperity.

Engineering in Society

- Creating the Societal Citizen…or Else?: All of higher education needs to commit to Creating the Societal Citizen.
- Creating the Societal Engineer: Engineers need an appreciation and passion for how they can use their education to improve society.

RECENT KEY FACULTY COMMITTEES

- Chaired Search Committee: Executive Director of Innovate@BU (2022-2023)
- Chaired Search Committee: Director of National and Emerging Infectious Disease Laboratories (2022)
- Dean Search Committee, Questrom School of Business (2017/18)
- Dean Search Committee, School of Education (2016/17)
- Dean Search Committee, College of Arts and Sciences (2014/15)
- Dean Search Committee, Sargent College of Allied Health and Rehabilitation Sciences (2013/14)
- Provost Search Committee, Boston University (2011)

PROFESSIONAL SERVICE

National Science Foundation

Member Advisory Committee for Engineering Directorate (1 of 12 members) 2016-2019
Member of Site-Visit Team for $8M Engineering Research Visioning Alliance program (2022)

Professional Societies and Conferences

- Engineering Deans Institute of ASEE
  - Chair of Planning Committee, 2009 Annual Meeting *"Engineering Education in the 21st Century"*
- AIMBE
  - President, (Transformed organizational structure, mission, impact, admin. and reputation)
  - Vice President
  - Executive Board: Secretary/Treasurer
  - Chair, Academic Council
  - Board of Directors
  - Nominating Committee
  - Fellows Selection Sub-Committee on Education
- Biomedical Engineering Society

2007	Long Range Planning Committee
2005	Track Chair, Pulmonary Bioengineering
2003	Track Chair, Pulmonary Bioengineering
2001	Track Chair, Respiratory Systems Engineering
2000	Session Chair, Dynamics in Lung Function
1998	Track Chair, Cardiopulmonary Engineering
1996	Session Chair, Airways, Tissues and Cell Mechanics Sessions
1995	Track Chair, Cardiopulmonary Eng. & New Frontiers in BME,
1995	Co-Chair of Entire Fall BMES Meeting at Boston University
1994	Session Chair, Respiratory Modeling
1993	Session Chair, Respiratory Mechanics I and Respiratory Mechanics II
1992-1995	Board of Directors
1992	Co-coordinator of Cardiopulmonary Track at BMES Fall Conference
1989-1991	Chairman, Student Affairs Committee
1987-1988	Member, Program Committee
1985	Faculty Advisor for Student Chapter

- IEEE – Engineering in Medicine and Biology Society

1987	Respiratory Track Coordinator at IEEE-EMBS Conference
1987	Session Chairman at IEEE-EMBS Conference
1987	Student Professional Awareness Conference (SPAC) Coordinator
1985	Faculty Advisor for Student Chapter

- American Physiological Society

1991-1996	Editorial Board for Modeling Methodology Forum

- American Thoracic Society

2011	Invited Session Chair: Computational Models of the Lung
2006 – 2007	Chair, Nomination Committee for Respiratory Structure Function Assembly
2003 – 2006	Respiratory Structure Function Program Committee
1991	Chair of Lung Mechanics Session

Journals Reviewer (several including)

- Journal of Applied Physiology
- ASME Journal of Biomedical Engineering
- Journal of Clinical Investigation
- Journal of Acoustical Society of America
- Annals of Biomedical Engineering
- IEEE Transactions in Biomedical Engineering
- American Journ. Of Resp. Crit. Care Medicine
- European Journal of Respiratory Research

Grant Agency Reviewer

- National Science Foundation:
  - ° Review Panels Biomedical Engineering Division
  - ° Review Panel Engineering Research Center
  - ° Review Panel Distinguished Teacher and Scientist
- National Institute of Health: Study Section Members for:
  - ° Respiratory and Integrated Systems Physiology (Twice)
  - ° Biomedical Research Partnerships
  - ° Ad Hoc: Respiratory and Applied Physiology Study Sect.
  - ° Roadmap: Centers for Interdisciplinary Research
  - ° NIGMS Biomedical Research Training Study Section
- Medical Research Council of Canada:
  - ° Ad Hoc Reviewer
- Whitaker Foundation:
  - ° Graduate Fellowship Review Committee
  - ° Special Opportunities Award Review / Site Visitor
  - ° Leadership & Development Award Review / Site Visitor

TEACHING, COURSE, AND CURRICULUM DEVELOPMENT

Courses* (*Self Developed)

- BE 467* **Product Design, Development, Marketing and Entrepreneurship in Biomedical Engineering** (Created Course)
  Taught primarily by Industry and Management School to all BME Seniors and 1st year graduate students to introduce students to the world of bench-to-bedside in industry or self-initiated companies. Taught in coordination with Senior Project courses below.
- BE465* **Senior Project: Senior technical/research project** (Created Course)
  Responsible for teaching written and oral technical communication skills at level of project proposal and how to approach independent research.
- BE466* **Senior Project: Senior technical/research project** (Created Course)
  Responsible for teaching written and oral technical communication skills at level of final project and how to approach independent research.
- BE740* **Parameter Estimation and Systems Identification**
  Self developed upper-graduate course with applications primarily in Biomedical Engineering.
- BE402 **Control Systems in Biomedical Engineering**
  Junior/Senior level with laboratory
- SC411 **Electronics I**: Junior level course in electronics.
- SC412 **Electronics II**: Junior/Senior level class in electronics and signals

Curriculum Development

- 1993 Designed new Post-B.S. and Post-M.S. Ph.D. program in Biomedical Engineering
- 1985 Created of Senior Design Project Program and Conference
  "How to Approach and Communicate Independent Technical Research and Design"
- 1985 **Creator of "Annual Biomedical Engineering Senior Project Conference"**
  Conference attended by industry, hospitals, alumni, and other universities. Average > 100 outside industry/research guests per year at conference.
  Conference now entering its 19th year
- 2003 Created: **Product Design, Development, Marketing and Entrepreneurship in Biomedical Engineering**

SUPERVISION OF STUDENTS AND POST-DOCTORAL SCIENTISTS

Graduate Student Primary Supervision

Ph.D. Students

Qin Zhang, Ph.D., Principal Scientist, Medtronics, Inc.
David Kaczka, M.D., Ph.D.: Associate Professor, Biomedical Engineering, U. Iowa
Cortney Henderson, Ph.D. Assistant Professor, Univ. California at San Diego
Nora Tgavelekos, Ph.D., Senior Scientist, Raytheon Corporation
Carissa Bellardine, Ph.D., Director of Venture Capital, Medtronic, Inc.
Derek Affonce, Ph.D., Development Engineer, Primaira, LL
Adam Laprad, Ph.D., Sr. Manager, Pre-Clinical R&D at BTG - PneumRx, Inc.
Brian Harvey, Ph.D. Senior Principal Scientist at Respiratory Motion, Inc

- Primary Advisor for 14 Masters students, Thesis Committee for 18 Masters Students

Senior Projects Supervised

- 63 students
- 1995, 2005. 2014 winner of Most Outstanding Biomedical Engineering Senior Project of the Year

Post-Doctoral Scientist Supervised

David Westwick, Ph.D.: Professor, University of Calgary
Gianlucca Nucci, Ph.D: VP Early Clinical Development Clinical Pharmacology
Adam Polack, Ph.D: Chair of Electronic Met, Wroclaw Univ. of Technology, Poland.
Raffaele L. Delaca, Ph.D: Associate Professor, Polytechnic Institute of Milan
Baoshon, MA, Ph.D:, Research Scientist, University of Vermont Medical Center
Hari Parameswaran, Ph.D., Assistant Professor of Biomedical Engineering, Northeastern University

PATENTS/SOFTWARE LICENSES

- TRAJ2: Ground-Based Radar Simulation Software, M.I.T. Lincoln Laboratory Software Center
- "Infant Respiratory Impedance Measuring Apparatus and Methods Using Forced Oscillations", Patent number: 5,318,038
- "Enhanced Ventilation Waveform Device for Mechanical Ventilators," Patent number: 6,435,182
- "Variable Peak Pressure Ventilation Method and System" Patent Number 6,907,881
- Provisional: "Pneumatically-Driven Oscillatory Flow Generator
- Provisional: "System and Method for Setting Positive End Expiratory Pressure During Mechanical Ventilation Based on Dynamic Lung Function"

CONSULTING

• 2014 - 2018	**Feather Sensors** Design of new forced oscillation flow sensors.	*New Jersey*
• 1985-1998	**Systems and Analysis** Simulation of and sensitivity analysis of various detection systems	*M.I.T. Lincoln Laboratory, Lexington, MA*
• 1996-Present	**Nellcor Puritan Bennett/Mallinckrodt** Diagnostic lung mechanics from patient ventilators	*San Diego, CA*
• 1990, 1991	**Department of Anesthesiology** Low Frequency Mechanics in the Canines	*University of Maryland*