

CURRICULUM VITAE

*Paul J. Gemperline
Department of Chemistry
East Carolina University
Greenville, NC 27858
February 19, 2018*

I. Background Information

Name: Dr. Paul J. Gemperline

Date of Birth: February 8, 1955

Educational Background:

- B.S.: Chemistry, Cleveland State University, (1973 - 1978)
- Ph.D.: Analytical Chemistry, Cleveland State University, (1978 - 1982)
- Title of Dissertation: The Design of the Laboratory Network DISNET

Present Rank:

- Professor, East Carolina University, (1993 -)

Teaching Experience:

- Assistant Professor, East Carolina University, (1982 - 1988)
- Associate Professor, East Carolina University, (1988 - 1993)
- Professor, East Carolina University, (1993 -)

Administrative Experience:

- Acting Associate Vice Chancellor, Division of Research and Graduate Studies, East Carolina University (Fall 2003 – 2005)
- Associate Vice Chancellor, Division of Research and Graduate Studies, East Carolina University (Fall 2006 – 2009)
- Acting Dean, Graduate school, East Carolina University (Dec. 2008 – Sept. 2009)
- Dean, the Graduate School, East Carolina University (Sept. 2009 – present)

Professional Memberships & Service:

- NC Council of Graduate Schools, President Elect, 2011-12; President 2012-13
- Conference of Southern Graduate Schools, President Elect, 2013-14; President 2014-15
- Council of Graduate Schools Project on the Master's Degree, Committee member, 2015-17
- American Chemical Society, Analytical Chemistry Division
- Society for Applied Spectroscopy
- Sigma Xi
- Phi Kappa Phi
- International Chemometrics Society

II. Research/Creative Activity

Editor-in-chief, *Journal of Chemometrics* (1/2007 – 3/2017)

North American Editor, *Journal of Chemometrics* (1996 - 2001)

Awards/Fellowships:

1983, 1984: NASA Lewis Research Center Summer Faculty Fellow

1985, 1986, 1987: Senior Visiting Scientist, Burroughs Wellcome Co

1987: East Carolina University Sigma Xi Helms Award for Outstanding Research

1999: East Carolina University Distinguished Research Professor of Chemistry (award for 5-year achievement and permanent title)

2001: East Carolina University College of Arts and Sciences Distinguished Professor of Chemistry (award for lifetime achievement and permanent title)

2003: Eastern Analytical Symposium Award for Achievements in Chemometrics

2010: William F. Meggers Award for outstanding paper in *Applied Spectroscopy*

2012 - present: Member, National Academy of Academic Inventors

III. Refereed publications (*corresponding author)

2230 SCOPUS citations as of 2/18/19

4308 Google Scholar citations as of 2/18/19 (includes books and book chapters)

1. "On Chemical Ionization of Alkyl-substituted Cyclopropanes," A. H. Andrist*, P. J. Gemperline, and H.-C. Chen, *Org. Mass Spectrom.*, **13**, 272 (1978)
2. "DISNET: A Distributed Instrument System Network," R. Megargle*, P. J. Gemperline, A. Dartt, L. Slivon, V. Zadnik, *J. Automatic Chem.*, **6**, 26 (1984)
3. "A Flexible Computer-to-computer Protocol for DISNET: A Distributed Instrument System Network," P. J. Gemperline and R. Megargle*, *J. Automatic Chem.*, **6**, 192-196 (1984)
4. "The Implementation of a GC/MS Data System Using DISNET: A Distributed Instrument System Network," P. J. Gemperline and R. Megargle*, *J. Automatic Chem.*, **6**, 197-201 (1984)
5. "A Priori Estimates of the Elution Profiles of the Pure Components in Overlapped Liquid Chromatography Peaks Using Target Factor Analysis," P. J. Gemperline*, *J. Chemical Information and Comput. Sci.*, **24**, 206-212 (1984)
6. "Target Transformation Factor Analysis with Linear Inequality Constraints Applied to Spectroscopic - Chromatographic Data," P. J. Gemperline*, *Anal. Chem.*, **58**, 2656-2663 (1986)
7. "Background Correction in Multicomponent Spectroscopic Analysis Using Target Transformation Factor Analysis," P. J. Gemperline*, S. E. Boyette, and K. Tyndall, *Appl. Spectrosc.*, **41**, 454-459 (1987)
8. "Principal Components Regression for Routine Multicomponent UV Determinations: A Validation Protocol," P. J. Gemperline* and A. Salt, *J. Chemometrics*, **3**, 343-357, (1989)
9. "Raw Materials Testing Using Soft Independent Modeling of Class Analogy Analysis of Near Infrared Reflectance Spectra," P. J. Gemperline*, L. Webber and F. Cox, *Anal. Chem.*, **61**, 138-144, (1989)

10. "Evolving Factor Analysis Applied to Flow-Injection Analysis Data," P. J. Gemperline* and J. C. Hamilton, *J. Chemometrics*, **3**, 455-461 (1989)
11. "Mixture Analysis Using Factor Analysis I: Calibration and Quantitation," P. J. Gemperline*, *J. Chemometrics*, **3**, 549-568 (1989)
12. "Mixture Analysis Using Factor Analysis II: Self Modeling Curve Resolution," J. C. Hamilton and P. J. Gemperline*, *J. Chemometrics*, **4**, 1-13 (1990)
13. "A Program For Calculating Mahalanobis Distances Using Principal Component Analysis," N. K. Shah and P. J. Gemperline*, *Trends in Anal. Chem.*, **8**, 357-361 (1989)
14. "Conditions for Detecting Overlapped Peaks with Principal Component Analysis in Hyphenated Chromatographic Methods," P. J. Gemperline*, *Anal. Chem.*, **61**, 2240-2243, (1989)
15. "Combination of the Mahalanobis Distance and Residual Variance Pattern Recognition Techniques for Classification of Near Infrared Reflectance Spectra," N. K. Shah and P. J. Gemperline*. *Anal. Chem.*, **62**, 465-470, (1990)
16. "Spectroscopic Calibration and Quantitation Using Artificial Neural Networks," J.R. Long, V.G. Gregoriou, and P.J. Gemperline*. *Anal. Chem.*, **62**, 1791-1797, (1990)
17. "Nonlinear Multivariate Calibration Using Principal Components Regression and Artificial Neural Networks," P.J. Gemperline*, J.R. Long and V.G. Gregoriou. *Anal. Chem.*, **63**, 2313-2323, (1991)
18. "Generalized Rank Annihilation Method Using Similarity Transformations," S. Li, J.C. Hamilton, and P.J. Gemperline*. *Anal. Chem.*, **64**, 599-607, (1992)
19. "Principal Component Analysis, Trace Metals, Chemometrics and Blue Crab Shell Disease," P.J. Gemperline*, K. Miller, S. Li, J. Bray and T. West. *Anal. Chem.*, **64**, 523A-531A, (1992)
20. "Developments in Nonlinear Multivariate Calibration", P. J. Gemperline*. *Chemometrics and Intelligent Lab. Systems.*, **15**, 115-126 (1992)
21. "Eliminating Complex Eigenvectors and Eigenvalues in Multiway Analyses Using the Direct Trilinear Decomposition Method", S. Li and P.J. Gemperline*, *J. Chemometrics* , **7** 77-88 (1993)
22. "Identification and Quantitation of Drugs of Abuse in Urine using the Generalized Rank Annihilation Method of Curve Resolution", Shousong Li, Paul J. Gemperline*, Kimberly Briley and Steven Kazmierczak, *J. Chromatogr. Biomed. Appl.* **655**, 213-223, (1994)
23. "Classification of Near-Infrared Spectra Using Wavelength Distances: Comparison to the Mahalanobis Distance and Residual Variance Methods", P. J. Gemperline* and N. R. Boyer., *Anal. Chem.*, **67**, 160-166 (1995)
24. "Pattern Recognition Analysis of Near-Infrared Spectra by Robust Distance Method", J. H. Cho and P. J. Gemperline*, *J. Chemometrics*, **9**, 169-178, (1995)
25. "A Near-Infrared Reflection Analysis Method for the Non-invasive Identification of Film-Coated and Non-Film-Coated Blister-Packed Tablets", M. A. Dempster, N. E. Meagher, B. F. MacDonald*, P. J. Gemperline, and N. R. Boyer. *Anal. Chim. Acta*, **310**, 43-52, (1995)
26. "UV/Visible Spectral Dissolution Monitoring by in-situ Fiber Optic Probes", J. H. Cho, P. J. Gemperline*, A. Salt., and D. S. Walker., *Anal. Chem.* **67**, 2858-2863 (1995)

27. "Wavelength Calibration Method for a CCD Detector and Multi-Channel Fiber-Optic Probes", J.H. Cho, P.J. Gemperline* and D.S. Walker, *Appl. Spectrosc.*, **49**, 1841-1845 (1995)
28. "Near-IR Detection of Polymorphism and Process Related Substances", P.K. Aldridge, C.L. Evans, H.W. Ward II, S.T. Colgan, N. Boyer, and P.J. Gemperline*, *Anal. Chem.*, **68**, 997-1002 (1996)
29. "Appearance of Discontinuities in Spectra Transformed by the Piecewise Direct Instrument Standardization Procedure", P. J. Gemperline*, J.H. Cho, P.K. Aldridge, and S.S. Sekulic, *Anal. Chem.*, **68**, 2913-2915, (1996)
30. "Determination of Multicomponent Dissolution Profiles of Pharmaceutical Products by In-Situ Fiber-Optic UV Measurements", Paul J. Gemperline*, JungHwan Cho, Brian Baker, Brian Batchelor, Dwight S. Walker, *Anal. Chim. Acta*, **345**, 155-159 (1997)
31. "Effective Mass Samples by NIR Fiber-Optic Reflectance Probes in Blending Processes", J.H. Cho, P.J. Gemperline*, P.K. Aldridge, and S.S. Sekulic, *Anal. Chim. Acta*, **348**, 303-310 (1997)^s.
32. "Rugged Spectroscopic Calibration for Process Control", P.J. Gemperline*, *Chemom. Intel. Lab. Systems*, **39**, 29-40 (1997)
33. "Fiber-Optic UV/Visible Composition Monitoring for Process Control of Batch Reactions", A. Quinn, P.J. Gemperline*, B. Baker, M. Zhu, and D.S. Walker, *Chemom. Intel. Lab. Systems*, **45**, 199-214, (1999)
34. "Multivariate Background Correction for Hyphenated Chromatography Detectors, P. J. Gemperline*, J.H. Cho, B. Archer, *J. Chemometrics*, **13**, 153-164, (1999)
35. "Computation of the Range of Feasible Solutions in Self-Modeling Curve Resolution Algorithms" P. Gemperline*, *Anal. Chem.*, **71**, 5398-5404, (1999)
36. "Chemometrics Characterization of Batch Reactions" Gemperline*, Paul J.; Min Zhu, Eric Cash, and Dwight S. Walker. *ISA Transactions*. **38**, 211-216, (1999)
37. "Wavelength Selection and Optimization of Pattern Recognition Methods Using the Genetic Algorithm", B. M. Smith* and P. J. Gemperline, *Anal. Chim. Acta*, **423**, 167-177 (2000)
38. "Design and Testing of a Multivariate Optical Element: The First Demonstration of Multivariate Optical Computing for Predictive Spectroscopy", O. Soyemi, D. Eastwood, L. Zhang, H. Li, J. Kanunamuni, P. Gemperline, R.A. Synowicki and M.L. Myrick*, *Anal. Chem.* **73**, 1069-1079, (2001)
39. "Quantitative Analysis of Low-Field NMR Signals in the Time Domain", Alison Nordon, Paul J. Gemperline, Colin A. McGill and David Littlejohn*, *Anal. Chem.*, **73**, 4286-4294, (2001)
40. "A single-element all-optical approach to chemometric prediction", M. L. Myrick, O. Soyemi, J. Karunamuni, D. Eastwood, H. Li, L. Zhang, A. E. Greer and P. Gemperline, *Vib. Spectrosc.*, **28**, 73-81 (2002)
41. "Multi-way Analysis of Trace Elements in Fish Otoliths to Track Migratory Patterns", P. J. Gemperline*, R. A. Rulifson, and L. Paramore. *Chemom. Intell. Lab. Syst.*, **60**, 135-146 (2002)

42. "Determination of ethylene oxide content of polyether polyols by low-field ^1H NMR spectrometry", Alison Nordon, Céline Meunier, Robert H. Carr, Paul J. Gemperline, and David Littlejohn*. *Anal. Chim. Acta*, **472**, 133-140 (2002)
43. "Bootstrap methods for assessing the performance of near-infrared pattern classification techniques", Brandye Smith and Paul J. Gemperline*, *J. Chemom.*, **16**, 241-246, (2002)
44. "Design of Angle-Tolerant Multivariate Optical Elements for Chemical Imaging", by O.O. Soyemi, F.G. Haibach, P.J. Gemperline and M.L. Myrick, *Applied Optics*, **41**, 1936-1941 (2002)
45. "Nonlinear Optimization Algorithm for Multivariate Optical Element Design", O.O. Soyemi, F.G. Haigach, P.J. Gemperline, and M.L. Myrick, *Appl. Spectrosc.*, **56**, 477-487, (2002)
46. "Characterizing Batch Reactions with in-situ Spectroscopic Measurements, Calorimetry, and Dynamic Modeling", B. Ma, P. J. Gemperline*, E. Cash, M. Bosserman and E. Comas, *J. Chemom.*, **17**, 470-479, (2003)
47. "Characterization of subcritical water oxidation with in-situ monitoring and self-modeling curve resolution", P. J. Gemperline*, Y. Yang, and Z. Bian, *Anal. Chim. Acta.*, **485**, 73-87 (2003)
48. "Advantages of Soft vs. Hard Constraints in Self-Modeling Curve Resolution Problems – Alternating Least-Squares with Penalty Functions (P-ALS)", P. J. Gemperline*, E. Cash, *Anal. Chem.*, **75**, 4236-4243, (2003)
49. "Calibration-Free Estimates of Batch Process Yields and Detection of Process Upsets Using in Situ Spectroscopic Measurements and Nonisothermal Kinetic Models: 4-(Dimethylamino)pyridine- Catalyzed Esterification of Butanol" Paul Gemperline*, Graeme Puxty, Marcel Maeder, Dwight Walker, Frank Tarczynski, and Mary Bosserman, *Anal. Chem.*, **76**, 2575-2582 (2004)
50. "Equilibrium Modeling of Mixtures of Methanol and Water", Graeme Puxty, Marcel Maeder, Kyle P. Radack and Paul J. Gemperline*, *Appl. Spectrosc.*, **59**, 329-334 (2005)
51. "Identification of Single Bacterial Cells in Aqueous Solution Using Confocal Laser Tweezers Raman Spectroscopy", C. Xie, J. Mace, M. A. Dinno, W. Tang, R. J. Newton, P. J. Gemperline, and Y. Li*, *Anal. Chem.*, **77**, 4390-4397 (2005)
52. "Grouping three-mode data with mixture methods: The case of the diseased blue crabs", P. M. Kroonenberg*, K. E. Basford, and P. J. Gemperline, *J. Chemom.*, **18**, 508-518, (2005)
53. "Non-negativity constraints for elimination of multiple solutions in fitting of multivariate kinetic models to spectroscopic data", Joaquim Jaumot, Paul J. Gemperline*, and Alexandra Stang, *J. Chemom.*, **19**, 97-106 (2005)
54. "Modeling of batch reactions with in-situ spectroscopic measurements and calorimetry", Graeme Puxty, Marcel Maeder, R. Russell Rhinehart, Samir Alam, Shane Moore, and Paul J. Gemperline*, *J. Chemom.*, **19**, 329-340 (2006)
55. "Advances in the Modeling and Analysis of Complex and Industrial Processes", Marcel Maeder*, Yorck-Michael Neuhold, Graeme Puxty, and Paul Gemperline, *P. Chemom. and Intell. Lab. Systems*, **82**, 75-82 (2006)
56. "Scale-up of batch kinetic models", Maryann Ehly, Paul J. Gemperline*, Alison Nordon, David Littlejohn, J. Katy Basford, Martin De Cecco, *Anal. Chim. Acta.*, **595**, 80-88 (2007)

57. "Characterization of Cu²⁺-binding modes in the prion protein by visible circular dichroism and multivariate curve resolution", J.B. Pollock, P.J. Cutler, J.M. Kenney, P.J. Gemperline, C.S. Burns*, *Anal. Biochem.*, **377**, 223-233, (2008)
58. "Advantages of soft versus hard constraints in self-modeling curve resolution problems. Penalty alternating least squares (P-ALS) extension to multi-way problems", Selena Richards, Robert Miller, Paul J. Gemperline*, *Appl. Spectrosc.*, **62**, 197-206, (2008)
59. "Multivariate kinetic hard-modelling of spectroscopic data: A comparison of the esterification of butanol by acetic anhydride on different scales and with different instruments", Puxty, Graeme*; Neuhold, Yorck-Michael; Jecklin, Marc; Ehly, Maryann; Gemperline, Paul; Nordon, Alison; Littlejohn, David; Basford, J. Katy; De Cecco, Martin; Hungerbuhler, Konrad., *Chemical Engineering Science* **63**, 4800-4809, (2008)
60. "Experimental monitoring and data analysis tools for protein folding Study of steady-state evolution and modeling of kinetic transients by multitechnique and multiexperiment data fusion", P. Cutler, P. J. Gemperline, A. de Juan*, *Anal. Chim. Acta*, **632**, 52-62, (2009)
61. "Methods for kinetic modeling of temporally resolved hyperspectral confocal fluorescence images", P. Cutler, D. M. Haaland, P. J. Gemperline*. *Appl Spectrosc.*, **63**, 153-63 (2009)
62. "Systematic Method for the Kinetic Modeling of Temporally Resolved Hyperspectral Microscope Images of Fluorescently Labeled Cells", P. J. Cutler, D. M. Haaland, P. J. Gemperline*, *Appl Spectrosc.*, **63**, 261-270, (2009)
63. "Comparison of the Use of Volume Fractions with Other Measures of Concentration for Quantitative Spectroscopic Calibration Using the Classical Least Squares Method", Mark, H.; Rubinovitz, R.; Heaps, D.; Gemperline, P.*; Dahm, D.; Dahm, K. *Appl. Spectrosc.*, **64**, 995-1006, (2010)
64. "Kinetic modeling of dissolution and crystallization of slurries with attenuated total reflectance UV-visible absorbance and near-infrared reflectance measurements.", Hsieh, C. H.; Billeter, J.; McNally, M. E. P.; Hoffman, R. M.; Gemperline, P. J.*, *Analytical Chemistry* **2013**, 85 (11), 5367-5375
65. "Comprehensive kinetic model for the dissolution, reaction, and crystallization processes involved in the synthesis of aspirin", David E. Joiner, Julien Billeter, Mary Ellen P. McNally, Ron M. Hoffman, Paul J. Gemperline*, *J. Chemometrics*, 420-428, 28 **2014**; DOI: 10.1002/cem.2605

Chapters in Books:

1. "Factor Analysis of Spectro-Chromatographic Data," P. Gemperline* and J. Hamilton in *Computer-Enhanced Analytical Spectroscopy*, Vol. 2, H.L.C. Meuzelaar, Ed., Plenum Press, New York (1990)
2. "Rugged Spectroscopic Calibration Using Neural Networks", P. J. Gemperline*, in "Frontiers in Analytical Spectroscopy", D.L. Andrews and A.M.C. Davies, Eds., *Royal Soc. Chemistry*, Cambridge, (1995)
3. "Introduction to Chemometrics", Paul J. Gemperline* in "*Practical Guide to Chemometrics, Second Edition*", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)
4. "Sampling Theory, Distribution Functions and the Multivariate Normal Distribution", Paul J. Gemperline* and John H. Kalivas, in "*Practical Guide to Chemometrics, Second Edition*", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)

5. "Principal Component Analysis", P. J. Gemperline*, in "*Practical Guide to Chemometrics, Second Edition*", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)
6. "Calibration", Paul J. Gemperline* and John H. Kalivas, in "*Practical Guide to Chemometrics, Second Edition*", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)
7. "Future Trends in Chemometrics", Paul J. Gemperline*, in "*Practical Guide to Chemometrics, Second Edition*", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)

Books:

1. "Practical Guide to Chemometrics, Second Edition", CRC Press, Boca Raton, FL, Paul J. Gemperline, Editor. (2006)

Conference Proceedings (refereed):

1. "Rugged Spectroscopic Calibration Using Neural Networks", P. J. Gemperline*. *Proc. Amer. Control Conf.*, **3**, 1862-1866, (1995)
2. "Chemometrics Characterization of Batch Reactions", P.J. Gemperline*, M. Zhu, E. Cash, and D.S. Walker, *Proc. annu. ISA Anal. Div. Symp.*, **31**, 157-165 (1998)
3. "Novel filter design algorithm for multivariate optical computing.", Soyemi, Olusola O.; Zhang, Lixia; Eastwood, DeLyle; Li, Hong; Gemperline, Paul J., Myrick, Michael L.; *Proc. SPIE-Int. Soc. Opt. Eng.* 4205: 288-299. (2001)
4. "Simple optical computing device for chemical analysis.", Soyemi, Olusola O.; Zhang, Lixia; Eastwood, DeLyle; Li, Hongli; Gemperline, Paul J.; Myrick, Michael L. *Proceedings of SPIE-The International Society for Optical Engineering.* 4284: 17-28, (2001)
5. "On-Line Optimization of a Batch Reaction – Development and Experimental Demonstration", S. Samir Alam, R. Russell Rhinehart*, Karen A. High, and Paul J. Gemperline, *Proceedings of the 2004 American Control Conference*, Paper FrM11.1, Boston, MA, June 30-July2, 2004

Book and software reviews (refereed):

1. P. Gemperline, V. Mouillet, and D. Serrano, "Software review of VISION[®], Version 2.21, available from Foss NIRSystems, Inc., 12101 Tech Road, Siver Spring, MD 20904, USA", *J. Chemom* , **14**, 99-100
2. P. Gemperline*, "SYSTAT 9.0. SPSS", *Anal. Chem.* **72**, 362A (2000)
3. P. J. Gemperline*, "Software Review of Vision" in *Journal of Chemometrics.* 99-100 (2000)

Journal editorials (non-refereed):

1. "Editorial", Paul J. Gemperline, *J. Chemom*, **21**, 1, (2007)
2. "The scientific method, multivariate curve resolution and constraints", Paul J. Gemperline, *J. Chemom.*, **21**, 87 (2007)
3. "The future of chemometrics and ubiquitous scientific computing", Paul J. Gemperline, *J. Chemom.*, **21**, 507-508 (2007)

Patents:

1. Myrick, Michael L.; Soyemi, Olusola O.; Gemperline, Paul J. Filter design algorithm for multi-variate optical computing. U.S. (2006), 19pp. US 7138156 B1 20061121

IV. Research Funding (*sole investigator except where noted*):

Total: \$2,689,736.80

1. "The Application of Factor Analysis to Detect Overlapped High Performance Liquid Chromatography Peaks Measured by Photodiode Array Detectors," The Burroughs Wellcome Co., \$25,400. (Funded 1/85 - 1/87)
2. "The Development of Factor Analysis with Linear Inequality Constraints and its Application to Chromatographic Data," Petroleum Research Fund, \$15,000. (Funded 2/85 - 2/87)
3. "Fellowship in Analytical Chemistry" The Burroughs Wellcome Co., \$22,800. (Funded 5/86 - 5/88)
4. "A New Method for Calibration and Background Correction in the Simultaneous Determination of Multiple Components in Pharmaceutical Products," North Carolina Board of Science and Technology, \$15,000. (Funded 6/86 - 7/88)
5. "Pattern Recognition Techniques for Raw Materials Testing: Phase I," Burroughs Wellcome Co., \$59,892. (Funded 4/88 - 4/89)
6. "Pattern Recognition Techniques for Raw Materials Testing: Phase II," Burroughs Wellcome Co., \$65,000. (Funded 4/89 - 8/90)
7. "Fellowship in Analytical Chemistry at East Carolina University," The Burroughs Wellcome Co., \$16,222. (Funded 7/90-8/91)
8. "Research Agreement with NIRSystems", NIRSystems, Inc., \$72,000 equipment donation. (Funded, 5/91)
9. "Nonlinear Spectroscopic Calibration Using Artificial Neural Networks," National Science Foundation through the Measurement, Control and Engineering Center, The University of Tennessee, Knoxville, TN. \$50,000. (Funded 1/92- 12/93)
10. "Undergraduate Research Stipend", NIRSystems, Inc., \$2,000, May, 1992.
11. "Chemometrics Applications in Pharmaceutical Analysis", Pfizer, \$8,500 (11/92-11/93)
12. "Burroughs Wellcome Co. Fellowship in Analytical Chemistry", with Dr. William H. Church. \$14,500. 1992
13. "Burroughs Wellcome Co. Fellowship in Analytical Chemistry", with Dr. William H. Church. \$29,000. 1993-94
14. "Spectroscopic Calibration for Process Control," National Science Foundation through the Measurement, Control and Engineering Center, The University of Tennessee, Knoxville, TN. \$25,000. (Funded 1/94- 3/95)
15. "Chemometrics Applications in Pharmaceutical Analysis", Pfizer Co., 10/93 - 10/94, \$8,500.00
16. "Research Fellowship in Analytical Chemistry", Burroughs Wellcome Co., 8/93 - 7/94, \$13,772.00
17. "Undergraduate Research Fellowship", NIRSystems Inc., 4/93 - 9/93, \$2150.00

18. "Application of Chemometrics for Pharmaceutical Analysis and Process Control", Pfizer, Inc., 1/95 - 6/95, \$15,116, *funded*
19. "Development of Multivariate Calibration Methods for In-Situ Dissolution Measurements", Burroughs Wellcome Co. and Zymark Corp. 5/94 - 9/95, \$9,972 each, \$19,944 total, *funded*
20. "Development of Multivariate Calibration Methods for In-Situ Dissolution Measurements", Burroughs Wellcome Co. and Zymark Corp. 5/94 - 9/95, \$5,509 each, \$11,018 total, *funded*
21. "Nonlinear Spectroscopic Calibration Using Artificial Neural Networks," National Science Foundation through the Measurement, Control and Engineering Center, The University of Tennessee, Knoxville, TN. \$25,000, 3/95- 12/95, *supplement, funded*
22. "Research Fellowship in Analytical Chemistry", Burroughs Wellcome Co., \$14,749, *funded, 4/95*
23. "Multivariate Background Correction for Capillary Electrophoresis Diode Array Detectors", Beckman Instruments, Inc., \$44,019, *funded, 7/95*
24. "Undergraduate Research in Chemometrics, Summer 1995", NIRSystems, Inc., \$3,166.80, *funded, 4/95*
25. "Chemometrics in Process Control", 3M Corp., \$5,000, *funded, 8/95*
26. "Undergraduate Reser in Chemometrics, Fall 1995", Glaxo Wellcome Co., \$2,400, *funded, 10/95*
27. "Multivariate Process Analysis and Control", 3M Corp., \$5,000, *funded, 3/96*
28. "Chemometrics Tools for In-situ Monitoring of Batch Reactions". Glaxo-Wellcome Co., \$15,507. 5/96-12/96
29. "Chemometrics Tools for In-situ Raman Monitoring of Batch Reactions". Jobin Yvon-Spex, Instruments SA Group. \$37,000. *Funded, 5/97*
30. "Chemometric Characterization of Batch Products and Processes". Pfizer, Inc., \$28,229. *Funded, 6/97*
31. "Chemometric Tools for In-situ Monitoring of Batch Processes". Glaxo-Wellcome Co., \$20,000. *Funded 4/12/97*
32. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline* and J. Sibert, The Measurement and Control Engineering Center, Knoxville, TN., \$25,854, *Funded, 8/97*
33. "Chemometrics in Process Control", 3M Corp., \$5,000 *supplement, funded, 6/97*
34. "Chemometric Tools for In-situ Monitoring of Batch Processes". Glaxo-Wellcome Co., \$10,000 *supplement. Funded 1/97*
35. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline* and J. Sibert, The Measurement and Control Engineering Center, Knoxville, TN., \$34,445, *Funded, 4/98*
36. "Characterization of subcritical hydrolysis and water oxidation with in-situ spectroscopic measurement and characterization", P. Gemperline* and Y. Yang, The Measurement and Control Engineering Center, Knoxville, TN., \$6,034, *Funded, 1/99*
37. "Development of a laboratory instrument for *in-situ* measurement, characterization, and optimization of batch reactions", A. Garrison, P. Gemperline*, D. Walker, C. Hamilton, The National Science Foundation (via The University of Tennessee), \$100,000, *Funded, 10/98*
38. "Catalytica Pharmaceutical Chemistry Internship Program", Catalytica Pharmaceuticals, Inc., Chia-Yu Li* and P. J. Gemperline, \$26,000, *Funded 1/99*

39. "Chemometrics Research", Elf Aquitaine, Inc., P. Gemperline* and V. Mouillet, \$10,000, Funded 2/99
40. "Glaxo-Wellcome Chemistry Internship", Glaxo-Wellcome Co., Inc., \$9,180, Funded, 5/99
41. "Characterization of subcritical hydrolysis and water oxidation with in-situ spectroscopic measurement and characterization", P. Gemperline* and Y. Yang, The Measurement and Control Engineering Center, Knoxville, TN., \$40,049, Funded, 8/99
42. "Experimental Batch Optimization", P. Gemperline and R. R. Rhinehart, The Measurement and Control Engineering Center, Knoxville, TN., \$40,902, Funded 4/00.
43. "Pattern Recognition Techniques", P. Gemperline, Eastman Kodak Co., Rochester, NY., \$8,000, Funded 9/00
44. "Experimental Batch Optimization", P. Gemperline and R. R. Rhinehart, The Measurement and Control Engineering Center, Knoxville, TN., Year 2: \$38,500, Funded 4/01.
45. "Experimental Batch Optimization", P. Gemperline and R. R. Rhinehart, The Measurement and Control Engineering Center, Knoxville, TN., Year 3: \$35,000, Funded, 8/2002.
46. "Chemometric Tools for Characterization of Evolving Chemical Processes", P. Gemperline, The National Science Foundation, CHE-0201014, \$232,000, Funded 8/2002
47. "Collaborative project between MCEC and CPACT: Experimental Batch Control and Optimization", National Science Foundation, EEC-0332330, \$31,900, Funded 7/15/2003
48. "Experimental Batch Optimization", P. Gemperline and R. R. Rhinehart, The Measurement and Control Engineering Center, Knoxville, TN., Year 4: \$22,000, Funded, 7/24/2003.
49. "International Travel Funds for Chemometric Tools For Characterization of Evolving Chemical Processes", Supplemental request to CHE-0201014, \$24,585, Funded 8/6/2003
50. "Chemometrics Tools for Salt and Polymorph Screening" GlaxoSmithKline, Research Triangle Park, NC, \$42,000 (funded, 2/2004)
51. "Comprehensive Models for Batch Process Development" P. Gemperline, The Measurement and Control Engineering Center, Knoxville, TN., Year 1: \$32,000, Funded 7/04
52. "Chemometrics Tools for Salt and Polymorph Screening, Year 2" GlaxoSmithKline, Research Triangle Park, NC, \$26,311 (funded, 5/2005)
53. "Comprehensive Models for Batch Process Development" P. Gemperline, The Measurement and Control Engineering Center, Knoxville, TN., Year 2: \$21,500, Funded 7/04
54. "Molecular Kinetic Fitting of Time-Dependent Hyperspectral Florescence Image Data". P. Gemperline, Sandia National Laboratories, \$100,656 (2/2006 – 10/2008)
55. "Expanding Faculty Participation in Externally Funded Research, Research Training, and Scholarship at East Carolina University" U.N.C.-General Administration (Office of the President), \$10,000 (funded 6/2006)
56. "Batch Slurry Process Characterization and Modeling" Paul J. Gemperline \$243,468 to ECU. The National Science Foundation, (funded 5/2008 – 5/2010). Multi-institutional "Grant Opportunities for Academic Liaison with Industry" (GOALI) project with Univ. of Tennessee – Knoxville, Oklahoma State Univ., and DuPont Crop Protection Science. Total funding \$663,468
57. *Raman spectroscopy for in vivo cell viability measurements in mammalian cell cultures*, Paul J. Gemperline, Maryann Cuellar, Kaiser Optical Systems, Inc., \$10,000, Awarded 2/2013

V. Administrative Presentations, Meetings & Consulting

1. "The Graduate School's Role in Financial Aid", Paul J. Gemperline, Annual Meeting of the Council of Graduate Schools, Washington, DC, December 2012.
2. Annual Graduate Recruiting & Retention Workshop, Organizer & presenter, East Carolina University, October 2012, October 2013, October 2015 and October 2017.
3. Program chair of the 2012 Annual Meeting of the NC Council of Graduate Schools, Greenville NC., October 2012.
4. Program chair of the 2013 Annual Meeting of the Conference of Southern Graduate Schools, San Antonio, TX, March 2013
5. "The Graduate School's Role in Financial Aid", Paul J. Gemperline, Council of Graduate Schools (CGS) Annual Meeting, San Diego, CA, December 2013
6. "Creating and Sustaining Successful Online Graduate Education Programs" Paul J. Gemperline, with Andrew Webber, Arizona State University and Patricia J. Campbell, American Public University, Council of Graduate Schools Annual Meeting, Washington, DC, December 2014
7. "Real-Time Tools for Forecasting Graduate Enrollment", Paul Gemperline, East Carolina University, July 2015
8. "CGS Master's Degree Project, Degree Competencies", Paul J. Gemperline, East Carolina University, Dennis Grady, Radford University, Council of Graduate Schools (CGS) Annual Meeting, Washington DC, October 2016.
9. "The Emerging Masters Degree", Paul Gemperline with Beth Boehm and Bob Augustine. Council of Graduate Schools (CGS) Annual Meeting, Washington, DC, December 8, 2016.
10. "Graduate Studies in the Charlotte Market: A Look at ECU's Awareness, Image and Competitive Position", Paul Gemperline, East Carolina University, Greenville NC, January 2017
11. Council of Graduate Schools (CGS) external review of the Graduate School of Western Kentucky University, with Richard Jackson and Janet DeLany, Bowling Green, KY, July 2017.
12. "Graduate Enrollment Planning", Paul J. Gemperline and Heidi Puckett, ECU Enrollment Management Taskforce, East Carolina University, Greenville, NC, February 2018

VI. Invited Research Presentations (*international*)

1. "Rugged Spectroscopic Calibration Using Neural Networks", P. Gemperline, presented at Spectroscopy Across the Spectrum at East Anglia University, *Norwich, England*. July 11-14, 1994
2. "NIR Analysis -- Applications to Pharmaceutical Materials", P. Gemperline and N. Boyer. The Swedish Academy of Pharmaceutical Sciences, International Symposium on Solid Oral Dosage Forms. *Stockholm, Sweden*. Feb. 8, 1994
3. "Parametric Statistical Methods of Pattern Recognition", P. Gemperline, The First Annual Meeting of the Swedish Chemometrics Society, The Royal Institute of Technology, *Stockholm, Sweden*. Feb. 9, 1994

4. "Recent Applications of GRAM in the Analysis of HPLC-Diode Array Measurements and the Effects of Model Errors", P. Gemperline, Seminar presented to the Department of Organic Chemistry, University of Umea, *Umea, Sweden*. Feb. 11, 1994
5. "Rugged Calibration for Process Control", P. Gemperline, presented at the "Compana '95 Conference, University of Würzburg, *Würzburg, Germany*, October 4, 1995
6. "Chemometrics: Extracting Meaningful Information from Multivariate Measurements", P. Gemperline, presented to Austrian Chemical Society, University of Graz, *Graz, Austria*. October 11, 1995
7. "Rugged Calibration for Process Control", P. Gemperline, presented to Austrian Chemical Society, University of Vienna, *Vienna, Austria*. October 12, 1995
8. "Effective Mass Sampled by NIR Fiber-Optic Reflectance Probes in Blending Processes", P. Gemperline, J.H. Cho, P.K. Aldridge, S.S. Sekulic, presented at the "Chemometrics in Analytical Chemistry International Conference (CAC-96), *Tarragona, Spain*. June 25-29, 1996
9. Fiber-optic UV/Visible Composition Monitoring for Process Control of Batch Reactions. P. J. Gemperline, presented as a plenary lecture at the "First Conference on Chemometrics in China", *Zhangjiajie, P.R. China*. Oct. 17-26, 1997
13. "Characterizing Batch Reactions with in-situ Measurements and Chemometrics", P. Gemperline. Presented at Strathclyde University, May 23, 2000, Glasgow, Scotland
14. "Characterizing Batch Reactions with in-situ Measurements and Chemometrics", P. Gemperline. Presented at University of Barcelona, May 30, 2000, Barcelona, Spain
15. Forecasting Batch Endpoints with In-situ Spectroscopic Measurements and Chemometrics", Paul J. Gemperline, Bei Ma, Eric Cash, Dwight S. Walker and Frank Tarczynski, Presented as a plenary lecture at the "Chemometrics and Analytical Chemistry 2000 Conference", Antwerp, Belgium, Oct. 16-20, 2000
16. Quantitative analysis of process NMR signals in the time domain", Paul J. Gemperline, Presented at the Royal Institute of Technology, March 16, 2001, Stockholm, Sweden.
17. "Fusing Data from Diverse Sources to Characterize Batch Reactions", Paul J. Gemperline, Shane Moore, Enric Comas, R. Russell Rhinehart, Karen High and Samir Alam, Presented at the conference "Advances in Process Analytics and Control Technology 2002" sponsored by the Centre for Process Analytics and Control Technology and the Royal Society of Edinburgh, Edinburgh, Scotland. April 25-26, 2002
18. "Characterizing Batch Reactions with in-situ Spectroscopic Measurements, Calorimetry, and Dynamic Modeling", Paul J. Gemperline, Bei Ma, Eric Cash, Shane Moore, and Enric Comas, Presented at the 2002 International Chemometrics Research Meeting sponsored by the Dutch Chemometric Society, Veldhoven, The Netherlands. May 27-30, 2002.
19. "Multivariate Kinetic Fitting of Batch Experimental Data", Paul J. Gemperline, Bristol University, Bristol, England. May 20, 2003
20. "Multivariate Kinetic Fitting of Batch Experimental Data", Paul J. Gemperline, Strathclyde University, Glasgow, Scotland. May 22, 2003
21. "Modeling of Batch Processes with in-situ Spectroscopic and Calorimetric Measurements", Paul J. Gemperline, Shane Moore, Rob Miller, R. Russell Rhinehart, Samir Alam, Marcel

- Maeder, Graeme Puxty, Presented at GlaxoSmithKline, Chemometrics (CTFN) Seminar, London, England, March 30, 2004.
22. "Modeling of Batch Processes with in-situ Spectroscopic and Calorimetric Measurements", Paul J. Gemperline, Shane Moore, Rob Miller, R. Russell Rhinehart, Samir Alam, Marcel Maeder, Graeme Puxty, The Royal Veterinary and Agricultural University of Denmark, Copenhagen, Denmark, April 2, 2004
 23. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Shane Moore, R. Russell Rhinehart, Samir Alam, Marcel Maeder, Graeme Puxty, presented at the "Ninth International Conference on Chemometrics in Analytical Chemistry" (CAC-2004), Lisbon, Portugal. September 20-23, 2004
 24. "Kinetic modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Universitat Rovira I Virgili, Tarragon, Spain, February 22, 2005
 25. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Novartis, Inc., Basel, Switzerland. June, 2005
 26. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Swiss Federal Research Institute, (ETH) Zurich, Switzerland. June, 2005
 27. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, ABB Bomem Group, Analytical Business, Quebec City, December 12, 2005
 28. "Model-based Analysis of Batch Processes Using Calibration-free in-situ Spectroscopy and Calorimetry", Paul J. Gemperline*, Maryanne Ehly, Heather Teague, Pat Cutler, Graeme Puxty, Marcel Maeder. International Workshop on Transport in Fluid Multiphase Systems: From Experimental Data to Mechanistic Models, RWTH Aachen University of Technology, Aachen, Germany, April, 27-28, 2006
 29. "Model-based analysis of batch processes using calibration-free in-situ spectroscopy and calorimetry", Paul J. Gemperline, Ernst Bezemer, Maryanne Ehly, Pat Cutler, Heather Teague, Graeme Puxty, Marcel Maeder, CAC-2006: Chemometrics in the Tropics, Águas de Lindóia, Brazil, September 11-15, 2006
 30. "Model-based analysis of batch processes using calibration-free in-situ spectroscopy and calorimetry", Paul J. Gemperline, Graeme Puxty, Marcel Maeder, Process Analytical Technology, Lyon, France, April 2007
 31. "Kinetic Modeling of Multivariate Spectroscopic Images", Paul Gemperline, Patrick Cutler, David Haaland, Erik Andries, 11th Chemometrics in Analytical Chemistry, Montpellier, France, July, 2008
 32. "Kinetic Modeling of Batch Slurry Reactions", Paul J. Gemperline, Mary Ellen McNally, Ron Hoffman, Chun Hsieh, David Joiner, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland, June 22, 2012
 33. "Kinetic Modeling of Batch Slurry Reactions", Paul J. Gemperline, Mary Ellen McNally, Ron Hoffman, Chun Hsieh, David Joiner, 13th Chemometrics in Analytical Chemistry, Budapest, Hungary, June 27, 2012
 34. "Kinetic modeling of batch processes involving slurries", Paul J. Gemperline, TIC2017 - Topics in Chemoemtrics, April 2017, Newcastle, NSW, Australia

Invited Presentations (national)

1. "When Pure Peaks Aren't Pure: An Application for Principal Component Analysis of Chromatographic-Spectroscopic Data," Eastern Analytical Symposium, New York, NY, (October, 1986)
2. "Self-Modeling Curve Resolution of Overlapped Chromatographic Peaks Using Iterative Target Transformation Factor Analysis," Department of Chemistry, Florida State University, Tallahassee, FL (January, 1987)
3. "Pattern Recognition for Raw Materials Identification and Testing in the Pharmaceutical Industry Using NIR Spectroscopy and SIMCA," Scientific Computing and Automation Symposium, Atlantic City, NJ (November, 1987)
4. "Detection and Resolution of Overlapped Spectro-Chromatographic Peaks Using Factor Analysis," Symposium on Computer Enhanced Analytical Spectroscopy, Salt Lake City, Utah (June, 1988)
5. "Curve Resolution Using Factor Analysis," Scientific Computing and Automation Conference, Philadelphia, PA (Oct., 1988)
6. "Factor Analysis of Chromatographic Data," 15th Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Boston, MA (Nov., 1988)
7. "Principal Component Analysis and Iterative Target Transformation of Spectro-Chromatographic Data," Eastman KODAK Company, Rochester, NY (Nov., 1988)
8. "Raw Materials Testing Using Principal Components Analysis of Near Infrared Reflectance Spectra," University of Delaware, Newark, Delaware (March, 1989)
9. "Survey of Multivariate Calibration Techniques," Scientific Computing and Automation Conference, Philadelphia, PA (Oct., 1989)
10. "Hypothesis Tests for Multivariate Calibration," 16th Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Chicago, IL (Oct., 1989)
11. "Chemometrics in Pharmaceutical Analysis," 17th Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Cleveland, OH (Oct. 12, 1990)
12. "Nonlinear Multivariate Calibration Using Artificial Neural Networks," Eastern Analytical Symposium, Somerset NJ, (Nov. 13, 1990.)
13. "Applications of Chemometrics in Environmental Chemistry" 21st International Symposium on Environmental Analytical Chemistry, *Jekyll Island, GA.* (May 1991)
14. "Spectroscopic Calibration with Neural Networks", The Dow Chemical Co., Midland MI (March 2, 1992)
15. "Nonlinear Calibration with Artificial Neural Networks", 1992 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA (March 11, 1992)
16. "Similarity Transformations for the Generalized Rank Annihilation Method", S. Li and P. Gemperline, 19th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Philadelphia, PA (Sept. 20-25, 1992)
17. "Spectroscopic Calibration with Artificial Neural Networks: Some Comments on Optimal Configurations", P. Gemperline and S. Li, 19th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Philadelphia, PA (Sept. 20-25, 1992)

18. "Pattern Recognition Analysis of Near Infrared Spectra", P. Gemperline, 36th Fall Technical Conference of the American Society of Quality Control and American Statistical Association, Philadelphia, PA (Oct. 8-9, 1992)
19. "Spectroscopic Calibration Using Artificial Neural Networks", P. Gemperline. 6th Annual Analytical Science Symposium, Hercules Inc., Wilmington, DE. May 17, 1993
20. "Chemometrics: Extracting Meaningful Information from Multivariate Measurements", P. Gemperline. 6th Annual Analytical Science Symposium, Paul J. Gemperline, Hercules Inc., Wilmington, DE. May 18, 1993
21. "Curve Resolution of Multicomponent Mixtures Using Three-Mode Principal Component Analysis and the Effect of Model Errors", P. Gemperline, The Gordon Research Conference in Analytical Chemistry, New Hampton, NH. Aug. 13, 1993
22. "Pattern Recognition Analysis of NIR Spectra", P. Gemperline and N. Boyer, 107th Annual AOAC International Meeting and Exposition, *Washington, DC*. July 27, 1993
23. "A Short Course in Chemometrics", P. Gemperline, Merck & Co., Inc., West Point, PA. Oct. 11-13, 1993
24. "Neural Network Analysis of Spectroscopic Data -- Some Successes and Pitfalls", P. Gemperline, AOAC International Special Symposium: Pharmaceutical Process Control and Quality Assessment by Non-Traditional Means. St. Louis, MO. October 14, 1993
25. "Rugged Spectroscopic Calibration Using Neural Networks", P. Gemperline, presented at the Federation of Analytical Chemists and Spectroscopy Societies (FACSS) 1994 Annual Conference, St. Louis, MO, October 4, 1994
26. "Rugged Spectroscopic Calibration for Process Control using Neural Networks", P. Gemperline, presented at the 1994 Pfizer Innovation Conference entitled "Profiting from Technology", Wakefield, MA, October 24-28, 1994
27. "Chemometrics: Extracting Meaningful Information from Multivariate Measurements", P. Gemperline, presented to the 3M Technical Forum, Analytical Chapter, St. Paul, MN, May 16, 1995
28. "Rugged Spectroscopic Calibration with Neural Networks and Partial Least-Squares", P. Gemperline, presented at the 1995 Eighth International Diffuse Reflectance Conference, Chambersburg, PA, Aug. 12-15, 1996
29. "Characterizing Batch Products & Processes with in-situ Spectroscopic Measurements", P. Gemperline, et. al., presented at the Pharmaceutical Manufacturers Association Technical Meeting, Washington, D.C., November 12, 1996
30. "Chemometrics and Chromatography: A novel HPLC/GRAM Separation", P. Gemperline* and Y. Wang, presented at the 1996 Eastern Analytical Symposium, Somerset, NJ, November 19, 1996
31. "Chemometrics in Pharmaceutical Analysis", P. J. Gemperline, presented to DuPont - Merck Co., Research Station, Wilmington, DE, March 26, 1998
32. "A Three Dimensional Graphical Technique for Visualizing Batch Process/Reaction Trajectories with Confidence Intervals" P. Gemperline, presented at the 1998 Eastern Analytical Symposium, Somerset, NJ, November, 1998

33. "A Method for Computing the Range of Feasible Profiles Estimated by Self-Modeling Curve Resolution" P. Gemperline, presented at the 1998 Eastern Analytical Symposium, Somerset, NJ, November, 1998
34. "Introducing Chemometrics in the Undergraduate Instrumental Analysis Lab", Paul J. Gemperline, presented at the 1999 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Vancouver, BC, Oct., 1999.
35. "Comparison of kinetic modeling and self-modeling curve resolution for characterizing batch process", Paul J. Gemperline*, Eric Cash, Zhensong Liu, Willem Windig, presented at the 1999 Eastern Analytical Symposium, Somerset, NJ, November, 1999
36. "Characterizing batch reactions with *in-situ* measurements and chemometrics", Paul J. Gemperline*, Zhensong Liu and Eric Cash, presented at the Fourteenth International Forum Process Analytical Chemistry, Las Vegas, NV, January, 2000
37. "Chemometric Characterization of Batch Reactions Using In-situ Spectroscopic Measurements and Self-Modeling Curve Resolution", Paul J. Gemperline, presented to Kodak Research, Rochester, NY Apr. 13, 2000
38. Exploratory Analysis of Multi-way Chemical Signatures in Biological Organisms, Paul J. Gemperline, Roger A. Rulifson, and Lee Paramore, presented at The 4th International Conference on Environmetrics and Chemometrics, September 18-20, 2000, Las Vegas, NV
39. "Fusing Multivariate Data from Diverse Sources to Characterize Batch Reactions" Paul J. Gemperline, Bei Ma, Eric Cash, and Shane Moore. Presented at the Chemometrics Award Ceremony for H. Siessler at the Eastern Analytical Symposium, Atlantic City, NJ, Oct. 3-5, 2001
40. "Process Analytical Chemistry, NIR Spectroscopy and Chemometrics in the Undergraduate Curriculum" Paul J. Gemperline. Presented at the NIR Award Symposium for Y. Ozaki, at the Eastern Analytical Symposium, Atlantic City, NJ, Oct. 3-5, 2001
41. "Quantitative Analysis of Low-Field NMR Signals in the Time Domain" Paul J. Gemperline, Alison Nordon, Colin A. McGill and David Littlejohn., Presented at the Eastern Analytical Symposium, Atlantic City, NJ, Oct. 3-5, 2001
42. "Forecasting Batch Endpoints with In-situ Spectroscopic Measurements and Chemometrics", Paul J. Gemperline, Presented to the School of Chemical Engineering, Oklahoma State University, Stillwater, OK. August 28, 2001
43. "Characterizing Batch Endpoints with In-situ Spectroscopic Measurements and Chemometrics" Paul J. Gemperline, Presented at Merck, Inc., West Point, PA, Oct. 15, 2001
44. "Characterization and Optimization of Batch Reactions with in-situ Spectroscopic Measurements", Paul J. Gemperline, R. Russell Rhinehart, and Karen High, Presented at the International Forum for Process Analytical Chemistry, San Diego, CA, Jan. 21-25, 2002
45. "Fusing Data from Diverse Sources to Characterize Batch Reactions", Paul J. Gemperline, Shane Moore, Enric Comas, R. Russell Rhinehart, Karen High and Samir Alam, presented at Eighth International Conference on Chemometrics in Analytical Chemistry (CAC-2002), Seattle, Washington, USA, September 22-26, 2002
46. "Chemometrics in Process Analytical Technology", Paul J. Gemperline, Department of Industrial and Physical Pharmacy, Purdue University, February, 2003

47. "Chemometrics in Process Analytical Technology", Paul J. Gemperline, Eli Lilly & Co., Indianapolis, IN, May 15, 2003
48. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, DuPont, Inc, Research Station, DE, Nov. 19, 2003
49. "20 Years of Chemometrics Research at an Undergraduate Institution In-situ Modeling of Batch Reactions", Paul J. Gemperline, Award Address presented at the 2003 Eastern Analytical Symposium Award for Achievements in Chemometrics, Somerset, NJ, Nov. 18, 2003
50. "Advantages of Soft vs. Hard Constraints in Self-Modeling Curve Resolution Problems – ALS with Penalty Functions (P-ALS)", Paul J. Gemperline and Eric Cash, 2003 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Ft. Lauderdale, FL, October 19 – 23, 2003
51. "Multivariate Kinetic Fitting of in-situ Raman Spectra From Non-Isothermal Batch Reactions", Paul J. Gemperline, Patrick Cutler, Doug Tsao, Marcel Maeder and Graeme Puxty, 2003 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Ft. Lauderdale, FL, October 19 – 23, 2003
52. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Shane Moore, R. Russell Rhinehart, Samir Alam, Marcel Maeder, Graeme Puxty, and Joaquim Jaumot, 2003 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Ft. Lauderdale, FL, October 19 – 23, 2003
53. "Fusion of calorimetric and spectroscopic measurements in a batch process model", Paul J. Gemperline*, Patrick Cutler, Marcel Maeder, Graeme Puxty, presented at the International Forum on Process Analytical Chemistry, Washington, DC, January, 2005
54. "Calibration-free modeling of batch processes and detection of process upsets with in-situ spectroscopic measurements", Paul Gemperline, Graeme Puxty, and Marcel Maeder, 2004 1992 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Chicago, IL, (March 11, 2004)
55. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline*, Maryann Ehly, Heather Teague, R. Russell Rhinehart, Samir Alam Marcel Maeder, Graeme Puxty, 2004 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Portland, OR, October 4 – 7, 2004
56. "Fusion of calorimetric and spectroscopic measurements in a batch process model", Paul J. Gemperline*, Patrick Cutler, Marcel Maeder, Graeme Puxty, presented at the International Forum on Process Analytical Chemistry, Washington, DC, January, 2005
57. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, presented to Bristol-Myer Squibb, New Brunswick, NJ. February 2, 2005
58. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Gordon Research Conference on Statistics in Chemistry and Engineering, Mount Holyoke College, July, 2005
59. "Multivariate Kinetic Modeling of Batch Processes", Gemperline, Paul J., Bezemer, E., Ehly, M., Teage, H., Cutler, P., Maeder, M., Puxty, G., Eastern Analytical Symposium, Somerset, NJ, November 15, 2005

60. "Kinetic modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, Department of Chemistry, The University of Delaware, November 16, 2005
61. "Fusion of calorimetric and spectroscopic measurements in a batch process model", Gemperline, P., Cutler, P., Maeder, M., Puxty, G., International Forum for Process Analytical Chemistry, Washington, DC, February 21, 2006
62. Characteristics of validatable PAT methods", 2005 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Quebec City, Canada, October 10, 2005
63. "NIR Studies of Hydrogen Bonding Using Physical Models Applied to Mixture Spectra", Gemperline, P., Bezemer, E., Smith, K., 2005 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Quebec City, Canada, October 11, 2005
64. "Model-based analysis of batch processes using calibration-free in-situ spectroscopy and calorimetry", Paul J. Gemperline, Ernst Bezemer, Maryanne Ehly, Pat Cutler, Heather Teague, Graeme Puxty, Marcel Maeder, 2006 Eastern Analytical Symposium, New Brunswick, NJ, November 14, 2006
65. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, AstraZeneca, Wilmington, DE, Jan. 2007
66. "Measurements and Modeling for Improved Performance of Batch Slurry Processes", Paul J. Gemperline, DuPont Stine-Haskill Research Center, June, 2008
67. "Statistical evaluation of visualization methods", Paul J. Gemperline, Workshop on Scientific Visualization, National Science Foundation, Washington, DC, Sept., 2008
68. "Chemometrics in Pharmaceutical Analysis", Paul J. Gemperline, Eli Lilly Co., Indianapolis, IN, Oct., 2009
69. "Kinetic Modeling of Batch Slurry Reactions", Paul J. Gemperline, Mary Ellen McNally, Ron Hoffman, Chun Hsieh, David Joiner, 2012 Eastern Analytical Symposium, New Brunswick, NJ, November, 2012
70. "Multivariate Modeling and Resolution of Evolving Systems", Paul J. Gemperline, Department of Chemistry, University of North Carolina at Chapel Hill, October 2012
71. "Perspectives on the interdisciplinary nature of chemometrics and the future of its identity as a discipline", Paul J. Gemperline, Maryann Cuellar, Paul Travorrow, CAC-14 (Chemometrics in Analytical Chemistry), Richmond, VA, June 2014

Invited Presentations (regional)

1. "Validation of a Multicomponent Spectroscopic Assays Using Factor Analysis," Burroughs Wellcome Co., Research Triangle Park, NC, (July, 1986)
2. "Pattern Recognition Analysis of Raw Materials," Department of Chemistry, North Carolina State University, Raleigh, NC (Feb., 1990)
3. "Pattern Recognition Analysis of Near Infrared Spectra," Department of Chemistry, University of North Carolina at Chapel Hill, Chapel Hill, NC (March, 1990)
4. "Trace Metals, Chemometrics and Blue Crab Shell Disease". Department of Chemistry, Virginia Commonwealth University, Richmond, VA (Oct. 17, 1991)
5. "Recent Advances in Chemometrics", P. Gemperline, Duke University, Department of Chemistry, Durham NC, (Nov. 6, 1992)

6. "Pattern Recognition of Spectroscopic Data", P. Gemperline, UNC-Greensboro, Department of Chemistry, Greensboro, NC (Dec. 4, 1992)
7. "Obtaining Information from Three-way Arrays of Chemical Measurements", P. Gemperline, Seminar presented at the Department of Chemistry and Biochemistry, University of South Carolina. Columbia, SC. Oct. 28, 1993
8. "Chemometrics in Pharmaceutical Analysis", P. Gemperline, presented at the Roche Carolina Symposium entitled "In-Process Analysis in Pharmaceutical Industry: Emerging Technologies", Florence, SC, May 26, 1994
9. "Artificial Neural Networks: Applications in Analytical Chemistry", P. Gemperline, presented to the Department of Physiology, East Carolina University School of Medicine, Greenville, NC, October 12, 1994
10. "Chemometrics: Extracting Meaningful Information from Multivariate Measurements", P. Gemperline, presented to Burroughs Wellcome Co., Greenville, NC, November 17, 1994
11. "Rugged Spectroscopic Calibration for Process Control", P. Gemperline, presented to Tennessee Eastman Co., Johnson City, TN, December 12, 1994
12. "Chemometrics, Trace Elements and Blue Crab Shell Disease" P. Gemperline, presented to the Department of Chemistry, The University of North Carolina at Wilmington, Wilmington, NC, January 27, 1995
13. "Chemometrics in Pharmaceutical Analysis", P. Gemperline, Wake Forest University, Winston-Salem, NC, November 15, 1995
14. "Chemometrics in Pharmaceutical Analysis: Batch control with in-situ spectroscopic analysis", Paul J. Gemperline*, Ashley C. Quinn, and Dwight S. Walker. Glaxo-Wellcome Inc., Research Triangle Park, NC. April 26, 1996.
15. "Forecasting Batch Endpoints with In-situ Spectroscopic Measurements and Chemometrics", Paul J. Gemperline, UNC-Pembroke Seminar, Department of Chemistry and Physics, Jan 17, 2002
16. "Modeling of batch processes with in-situ spectroscopic and calorimetric measurements", Paul J. Gemperline, presented to Appalachian State University, Department of Chemistry, Boone, NC. March 18, 2005
17. "Multivariate Modeling and Resolution of Evolving Systems", Paul J. Gemperline, Glaxo-SmithKline, Research Triangle Park, NC, Oct. 23, 2012

VII. Contributed Research Presentations:

1. "The Design of a Network Architecture and Its Application to a GC/MS Data System," 1981 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlantic City, NJ (March 1981)
2. "Quantitative Separation of Two or More Overlapping Chromatographic Peaks Using Factor Analysis and Self-Modeling Target Tests," Eastern North Carolina Section of the American Chemical Society, Greenville, NC (Nov., 1983)
3. "Factor Analysis of Chromatographic Data," South Eastern Association of Analytical Chemists, Columbia, SC, (April 27, 1984)

4. "Target Transformation Factor Analysis with Linear Inequality Constraints," 36th Southeastern Regional Meeting of the American Chemical Society, Raleigh, NC, (October 26, 1984)
5. "Quantitative Peak Areas of Overlapping Chromatographic Peaks Using Target Transformation Factor Analysis with Linear Inequality Constraints," National Meeting of the American Chemical Society, (May 1, 1985)
6. "Wavelength Selection and Nonlinear Response in Multivariate Spectroscopic Assays," V.G. Gregoriou, P. J. Gemperline, 1990 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New York, NY (March 1990)
7. "Raw Materials Testing by Pattern Recognition Techniques Using Near Infrared Reflectance Spectra," N. K. Shah, P. J. Gemperline, 1990 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New York, NY (March 1990)
8. "Determination of Protein in Wheat from Near-Infrared Spectra Using Artificial Neural Networks," J. R. Long, P. J. Gemperline, 1990 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New York, NY (March 1990)
9. "Trace Metals, Chemometrics and Blue Crab Shell Disease". Eastern North Carolina Section of the American Chemical Society, Greenville, NC (Jan. 28, 1992)
10. "Similarity Transformation for the Generalized Rank Annihilation Method", S. Li and P.J. Gemperline, 19th Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Philadelphia, PA (Sept. 22, 1990)
11. "Spectroscopic Calibration with Artificial Neural Networks: Some Comments on Optimal Configurations", P.J. Gemperline and S. Li, 19th Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Philadelphia, PA (Sept. 24, 1990)
12. "Weight Smoothing Neural Network Training Algorithm for Spectroscopic Calibration" P. Gemperline, S. Li, Measurement and Control Engineering Center Industrial Advisor's Board Meeting, Knoxville, TN (Sept. 15-17, 1992)
13. "Nonlinear Calibration with Artificial Neural Networks" P. Gemperline, S. Li, Measurement and Control Engineering Center Industrial Advisor's Board Meeting, Knoxville, TN (March. 31, 1993)
14. "Novel Measurement Strategies for the GRAM Method of Calibration", P. Gemperline, Research meeting at the Department of Chemistry, Virginia Commonwealth University, Richmond, VA. June 29, 1993
15. "Nonlinear Calibration with Artificial Neural Networks", P. Gemperline, Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. Sept. 13, 1993
16. "Chemometrics in Pharmaceutical Analysis -- A Survey of Past and Present Research", P. Gemperline, Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 14, 1994
17. "Spectroscopic Calibration for Process Control", P. Gemperline, Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 15, 1994

18. "Robust Pattern Recognition", JungHwan Cho and P. Gemperline, Poster presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 15, 1994
19. "Comparison of Three Pattern Recognition Techniques for Classification of Raw Materials Using NIR Spectroscopy", Nicole R. Boyer and P. Gemperline, Poster presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 15, 1994
20. "High Speed Pre concentration and Analysis of Drugs Using HPLC and Chemometrics", Yafei Wang and P. Gemperline, Poster presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 15, 1994
21. "Spectroscopic Calibration for Process Control", P. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. Sept. 20, 1994
22. "Spectroscopic Calibration for Process Control", P. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 28, 1995
23. "In-Situ Dissolution Testing Using Fiber Optics and a CCD Detector", JungHwan Cho and P. Gemperline, Poster presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 28, 1995
24. "Fiber-Optic UV/Vis/NIR Composition Monitoring and End Point Detection of Batch Reactions", Ashley L. Cooper, Yafei Wang, and P. Gemperline, Poster presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 28, 1995
25. "Rugged Spectroscopic Calibration for Process Control using Neural Networks", P. Gemperline, American Control Conference, Seattle, WA, June 1995
26. "Spectroscopic Calibration for Process Control", A. Quinn*, B. Smith, and P. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. October 9, 1995
27. Fiber-Optic UV/Vis/NIR Composition Monitoring of Batch Reactions, Ashley Quinn*, P. Gemperline, 1995 Student Meeting-in-Miniature, East Carolina University, Greenville, NC. Nov. 10, 1995
28. Characterizing batch reactions with in-situ spectroscopic measurements, Brandye Smith*, P. Gemperline, 1995 Student Meeting-in-Miniature, East Carolina University, Greenville, NC. Nov. 10, 1995
29. "Chemometrics in Pharmaceutical Analysis -- Extracting Useful Information from Measurements", P. Gemperline, Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. April 1, 1996
30. "Spectroscopic Calibration for Process Control", A. Quinn and P. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. April 3, 1996
31. "Fiber-Optic UV/Vis Composition Monitoring of Batch Reactions", A. Quinn, P. Gemperline and D. Walker, presented at the 1996 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Kansas City, MO (Oct. 1, 1996)

32. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline and J. Sibert, presented to the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. April 2, 1997
33. "Chemometrics -- Extracting Useful Information from Measurements", presented at Appalachian State University, April 4, 1997
34. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline and J. Sibert*, presented to the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. Oct. 13-14, 1997
35. "Application of the Bootstrap to Pattern Recognition and Chemometrics", Brandye M. Smith* and Paul J. Gemperline, presented at the 1997 Eastern Analytical Symposium, Somerset, NJ, November, 1997
36. "In-situ monitoring of batch processes with UV/Vis fiber-optic measurements and chemometrics" Min Zhu*, Paul J. Gemperline, Ashley Quinn, and Dwight S. Walker, presented at the 1997 Eastern Analytical Symposium, Somerset, NJ, November, 1997
37. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline and J. Sibert*, presented to the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. April 6-7, 1998
38. "Chemometrics Characterization of Batch Reactions", P.J. Gemperline*, M. Zhu, E. Cash, and D.S. Walker, *Int. Soc. Measurement and Control, Analysis Division*, Raleigh, NC, April 27, 1998
39. "Chemometrics Tools for In-situ Raman Monitoring of Batch Reactions". P. Gemperline* Jobin Yvon-Spex, Instruments SA Group, Edison, NJ, May 22, 1998
40. "Lack of uniqueness in self-modeling curve resolution profiles for $N \geq 3$ components: A new method for estimating feasible bands", P. Gemperline*, Gordon Research Conference, Newport, RI, June, 1998
41. "Multivariate Characterization of Batch Catalytic Reactions", P. Gemperline and J. Sibert*, presented to the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. October, 1998
42. "A Method for Computing the Range of Feasible Profiles Estimated by Self-Modeling Curve Resolution", P. Gemperline*, 1998 Eastern Analytical Symposium, Somerset, NJ, November, 1998
43. "A Three Dimensional Graphical Technique for Visualizing Batch Process/Reaction Trajectories with Confidence Intervals", P. Gemperline*, 1998 Eastern Analytical Symposium, Somerset, NJ, November, 1998
44. "In-Situ Fiber-Optic Raman / Chemometrics Characterization of Batch Emulsion Polymerization Reactions", P. Gemperline*, M. Hansen and M. Dhamdhare, Thirteenth International Forum Process Analytical Chemistry, San Antonio TX, January, 1999
45. "Characterization of subcritical hydrolysis and water oxidation with in-situ spectroscopic measurement and characterization", P. Gemperline* and J. Yang, presented to the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March, 1999

46. "Characterizing Batch Reactions with in-situ Measurements and Chemometrics", P. Gemperline. Presented at the South East Association of Analytical Chemists (SEAAC), Charleston, SC. Sept. 23-24, 1999
47. "Development of a laboratory instrument for *in-situ* measurement, characterization, and optimization of batch reactions", Eric Cash and Paul J. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Stilwater, OK. October, 1999
48. "Characterization of Subcritical Water Oxidation with *in-situ* Monitoring", Mary Bian, Yu Yang, and Paul J. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Stilwater, OK. October, 1999
49. "Development of a laboratory instrument for *in-situ* measurement, characterization, and optimization of batch reactions", Eric Cash and Paul J. Gemperline, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. April, 2000
50. Characterization of Subcritical Hydrolysis and Water Oxidation with in-situ Spectroscopic Measurement and Characterization, Paul J. Gemperline, Frank Yang, and Mary Bian, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Wilmington, DE. October, 2000
51. DECRA quantitative mixture analysis of process NMR time-domain signals, Paul J. Gemperline, Colin McGill and Alison Nordon, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Wilmington, DE. October, 2000
52. Experimental Batch Optimization, Paul J. Gemperline, Karen High, and R. Russell Rhinehart, presented at the Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Wilmington, DE. October, 2000
53. Quantitative analysis of process NMR signals in the time domain, C. A. McGill, A. Nordon, S.K. Setarehdan, P. J. Gemperline, D. Littlejohn, and J.J. Soraghan, presented at the "Chemometrics and Analytical Chemistry 2000 Conference", Antwerp, Belgium, Oct. 16-20, 2000
54. "Multi-way Analysis of Trace Elements in Striped Bass Otoliths", Paul J. Gemperline, Roger A. Rulifson, and Lee Paramore, 15th Annual Meeting of the Tidewater Chapter, American Fisheries Society, Easton, Maryland, March 1-3, 2001
55. "Quantitative Analysis of Process NMR Signals in the Time Domain", Paul J. Gemperline, Alison Nordon, Colin A. McGill and David Littlejohn., Presented at the annual meeting of the South East Association of Analytical Chemistry, Columbia, SC, Nov 1-3, 2002.
56. "Experimental Batch Optimization", Paul J. Gemperline, Shane Moore, Rob Miller, R. Russell Rhinehart, Karen High, Burhani Razvi, and Samir Alam, Presented at the Fall Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. Oct. 17-19, 2001
57. "Quantitative analysis of process NMR signals in the time domain", P.J. Gemperline, D. Littlejohn, C.A. McGill, A. Nordon, Presented at the Fall Industrial Advisory Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. Oct. 17-19, 2001
58. "Experimental Batch Optimization", Paul J. Gemperline, Shane Moore, Rob Miller, R. Russell Rhinehart, Karen High, and Samir Alam, Presented at the Fall Industrial Advisory

Board Meeting of the Measurement and Control Engineering Center, Knoxville, TN. March 8-10, 2002

59. "Kinetic Fitting of Chemical Reactions Using Spectroscopic Data", Mary A. Bosserman and Paul J. Gemperline, Eastern Analytical Symposium, Somerset, NJ, November, 2002
60. "Fusing Data from Diverse Sources to Characterize Batch Reactions", Paul J. Gemperline, Shane Moore, Enric Comas, R. Russell Rhinehart, Karen High and Samir Alam, Eighth International Conference on Chemometrics and Analytical Chemistry (CAC-2000), Seattle, WA, September, 2002
61. "Characterization and Optimization of Batch Reactions with in-situ Spectroscopic Measurements and Calorimetry", Paul J. Gemperline, Shane Moore, R. Russell Rhinehart, Karen High and Samir Alam, Seventeenth International Forum on Process Analytical Chemistry, Scottsdale, AZ, January 2003
62. "Classification of Near-Infrared Spectra of Pharmaceutical Ingredients to Discriminate Between Similar Materials and Detect Impurities", Paul J. Gemperline, IIR Conference on Process Analytical Technologies, Washington, DC, February, 2003
63. "Kinetic Modeling of Multivariate Spectroscopic Images", Patrick J. Cutler, Paul J. Gemperline, Eastern Analytical Symposium, New Brunswick, NJ, Nov. 2007
64. "Kinetic Modeling of Multivariate Spectroscopic Images", Paul Gemperline, Patrick Cutler, David Haaland, Erik Andries, Federation of Analytical Chemistry and Spectroscopy Societies, Reno, NV, Oct. 2008
65. "Measurements and Modeling for Improved Performance of Batch Slurry Processes", Paul Gemperline, Mary Ellen McNalley, Ron Hoffman, Chun Hsieh, David Joiner, John Blanton, Chad Adkins, Eastern Analytical Symposium, New Brunswick, NJ, Oct. 2010
66. "Thermo-kinetic Models of Near-Infrared Spectra from Time-Evolving Systems", Paul J. Gemperline, 2011 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 2011
67. "Multivariate Modeling and Chemometric Resolution of Pure Component Profiles from Mixture Spectra of Evolving Systems", Paul J. Gemperline, Chun Hsieh, David Joiner, Julien Billeter, Mary Ellen P. McNally, Ronald M. Hoffman, 2013 Pittsburgh Conference on Analytical and Applied Spectroscopy, Chicago, IL, March 2013
68. "Multivariate Modeling and Resolution of Batch Systems", Paul Gemperline, Patheon Quality By Design Conference, Raleigh NC, September 2017

VIII. Graduate Research Directed (Master's thesis):

1. Mr. J. Craig Hamilton, "Applications of Evolving Factor Analysis in Chromatography and Flow Injection Analysis," M.S. (1985 - 88)
Current position: Owner & President, Hamilton Associates, Inc., Greenville, NC
2. Ms. Laurie Webber, "Applications of Pattern Recognition for Raw Materials Testing in the Pharmaceutical Industry," (1986 - 88)
Current position: Analytical Services Lab Mgr., Lonza
3. Mr. James Long, "Spectroscopic Calibration and Quantitation Using Artificial Neural Networks with Back-Propagation of Error," (1987 - 1990)
Current position: Principal Software Project Lead at Roche Diagnostics

4. Mr. Vasilis Gregoriou, "Wavelength Selection and Nonlinear Response in Multicomponent Spectroscopic Assays," (1987 - 1988)
PhD, 1993, Duke University
Current position: Director and Chairman of the Board at National Hellenic Research Foundation (NHRF), Athens, Greece.
5. Mr. Shousong Li, "Curve Resolution of Multicomponent Mixtures Using Three-Mode Principal Component Analysis" (1991-1993)
Current position: Senior Scientist, Merck
6. Mr. Kevin Miller (1992 - 1998)
Ph.D. student, East Carolina University, Coastal Resource Management
7. Ms. Yafei Wang, "High Speed Analysis of Drugs using Ion-Exchange Chromatography and Chemometrics" M.S. (1993 - 1995)
Current position: Industrial Chemist
8. Ms. Ashley Cooper Quinn, "Fiber-Optic UV/Visible Composition Monitoring of Batch Reactions" M.S. (1995 - 1997)
Current position: full time mother and real-estate agent
9. Ms. Brandye Smith-Goettler, "Application of the Bootstrap and the Genetic Algorithm to Pattern Recognition", M.S. (1995 - 1997)
PhD 2002, NC State University
Current position: Process Analytical Chemist, Merck
10. Ms. Michelle Zhu, "Characterization of Batch Processes with In-Situ Spectroscopic Measurements and Self-Modeling Curve Resolution", M.S. (1996 - 1998)
Current position: Chemometrician, NIRSystems, Inc
11. Mr. Zhengsong Liu, "Characterization of Multiple Runs in Batch Processes with In-Situ Spectroscopic Measurements and Self-Modeling Curve Resolution", M.S. (1997 - 1999)
12. Mr. Eric Cash (1997 - 2003) "Multivariate Kinetic Fitting".
Current position: Chemometrician, H&A Scientific, Inc.
13. Zihui Bian "Characterization of Subcritical Water Oxidation with In-Situ Monitoring", (1998 - 2000)
Current position: Actuarial statistician for a major insurance company
14. Bei Ma "Characterization and Optimization of Consecutive Batch Reactions with In-situ Spectroscopic and Calorimetric Measurements and Chemometrics Methods", M.S. (1999 - 2001)
Current position: Vice president, Global Healthcare Business Sector for the British Standards Institution (BSI) Group
15. Shane Moore (2001 - 2003) "Experimental Batch Optimization"
Forensic chemist, NC State Bureau of Investigation, 2004-2010
Current position: PharmD student, UNC-CH
16. Robert Miller (2001 - 2003) "Solving Rank Deficiency in Multivariate models"
Current position: Scientist II, Process Analytical Chemistry, Abbvie
17. Maryann Ehly Cuellar (2004 - 2005) "Scale Up of Batch Kinetic Models"
Current position: Product Specialist, Kaiser Optical Systems

18. Heather Teague (2004 - 2008) “Comprehensive Modeling of Molecular Associations in Reacting Systems Using NIR Spectroscopy”
PhD, 2014, Brody School of Medicine, ECU
Current position: NIH Postdoctoral Fellow, National Heart, Lung and Blood Institute
19. Patrick Cutler (2006 - 2008) “Kinetic Modeling of Temporally-Resolved Hyperspectral Fluorescence Images”
PhD 2013, University of New Mexico
Current position: Research Scientist, Teledyne Scientific and Imaging
20. Teresa Byers Kirchner (2007 - 2009)
Current position: Senior Analytical Chemist, BAE Systems
21. John Blanton (2008 - 2010)
Current position: Medical sales representative
22. Chun Hseih (2010 – 2012)
PhD 2016, University of South Carolina
Current position: Certified Science Instructor, Sumter School District, SC
23. David Joiner (2011-2012)
Current position: Chemometrician, algorithm development for identification of CBRNE threats from spectrometric and imaging data, Smiths Detection

IX. Visiting Ph.D. Research Students Directed:

1. Daniel Serrano, Universidad Autonoma de Barcelona, Catalunya, Spain (Fall 1999)
2. Colin McGill, The Strathclyde University, Glasgow, Scotland (Fall, 1999)
3. Enric Comas, Rovira i Virgili University, Tarragona, Spain (Spring 2002)
4. Jenny Nystrom, Sweden (Spring 2002)
5. Antonio Peinado, Universidad Autonoma de Barcelona. Fall 2002.
6. Grame Puxty, University of Newcastle, Australia. Spring 2003.
7. Joaquim Jaumot, Universitat de Barcelona, Barcelona, Spain. April 2003 - Oct. 2003
8. Selena Richards, University of Hull, East Yorkshire, England. November 2003 - January 2004
9. Robert Cogdill, Duquesne University, Pittsburgh, PA. February, 2004
10. Elnaz Tavakkoli, Institute of Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran, 2017
11. Mahsa Akbari, Institute of Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran, 2017

X. Postdoctoral Research Directed:

1. Dr. Ebenezer Asafu-Adjae, (1987)
Current position: Chemistry Faculty member at Hampton University
2. Dr. Nilesh K. Shah (1988 - 1990)
Research Chemist, Chemical Waste Industries, Inc

3. Dr. JungHwan Cho (1994 - 1995)
Analytical Chemometrician, Assistant professor, College of Pharmacy, Sookmyung Women's University, Cheongpa-Dong, Yongsan-Ku, 140-742, Seoul, Korea
4. Dr. Virginie Mouillet (1998 - 1999)
Government scientist, France
5. Dr. Ernst Bezemer (2004 – 2005)
Process analytical chemist, Solutia Inc
5. Dr. Julien Billeter (2010 – 2011)
Postdoctoral Research Associate, EPFL – Lausanne, Switzerland

XI. Undergraduate Research Directed:

1. Mr. Howard Joyner (Fall 1984 - Spring 1985)
1. Mr. James Long (Fall 1984 - Spring 1985, Spring 1987)
2. Mr. Christopher Kidd (Fall 1984)
3. Mr. William Stonestreet (Fall 1985 - Summer 1985)
4. Ms. Stacey Boyette (Fall 1985 - Spring 1986)
5. Mr. Donald Westbrook (Spring 1985)
6. Mr. Robert Ferguson (Fall 1986)
7. Mr. Lonnie Kinker (Spring 1987)
8. Ms. Yolanda Moore-Hayes (Fall 1987)
9. Mr. J. P. Draughon (Fall 1990)
10. Mr. Edward Massey (Fall 1992)
11. Ms. Nicole Boyer (Summer, 1993)
12. Ms. Celeste Brown (Summer, 1993)
13. Mr. Alton Murdoch (Spring, 1994)
14. Ms Jennifer Gill (Summer, 1994)
15. Ms. Heather Phillips (Fall, 1994)
16. Ms. Brandye Smith (Summer, 1995)
17. Mr. Brian Baker (Summer, 1995)
18. Mr. Shane Moore (Spring, 1999)
19. Mr. Rob Miller (Spring, 1999, Fall 2000, Spring 2001)
20. Ms. Mary Bosserman (Spring 2002, Fall 2002)
21. Mr. Patrick Chandler (Spring 2002)
22. Mr. Trevor Austin (Spring 2002)
23. Mr. Kevin Wray (Spring 2003, Fall 2003)
24. Mr. Akarsh Manne (Spring 2003, Fall 2003)
25. Mr. Kyle Radack (Spring 2003)
26. Mr. Matt Warren (Spring 2003, Summer 2003)
27. Mr. Douglas Tsao (Spring 2003)

28. Ms. Maryann Ehly (Summer 2003 – Fall 2004)
29. Ms. Heather Teague (Summer 2003 – Spring 2004)
30. Mr. Corey Lawson (Spring 2004)
31. Ms. Kristen Smith (Summer 2004 – Spring 2005)
32. Mr. Patrick Cutler (Spring 2003 – Spring 2006)
33. Mr. Nicolas Nagel (Spring 2006)
34. Mr. John Blanton (Spring 2007)
35. David Joyner (2009 - 2010)
36. Kyle Abshire (2009 - 2010)
37. Chun Hsieh (2009 - 2010)
38. Kaitlyn Bush (2009)
39. Clay Christian (2009)
40. Iola Concahr (2009)
41. Jamelle Simmons (2009)
42. Ryan Vick (2009)
43. Chad Adkins (2010 - 2011)
44. Kristen Scott (2011 – 2012)
45. Ethan Chiappisi (2011 – 2012)

XII. Other professional activities:

1. Secretary-Treasurer of Eastern North Carolina Section of the American Chemical Society (1983-1984)
2. Faculty Advisor for the Local Student Affiliate Chapter of the American Chemical Society (1983-1988)
3. Co-organizer of the symposium “Obtaining Information from Chemical Data,” Greenville, NC (March, 1984)
4. Co-organizer of the 1986 Annual Meeting of the Southeastern Association of Analytical Chemists, Greenville, NC (April, 1986)
5. Organizer of the session entitled “Curve Resolution Methods in Chromatography,” at the 1989 Federation of Analytical Chemistry and Spectroscopy Societies annual conference held in Chicago, IL, October 6, 1989
6. Organizer of the session entitled “Applications of Chemometrics to Industrial Problems,” at the 1990 Federation of Analytical Chemistry and Spectroscopy Societies annual conference held in Cleveland, OH, October 8-9, 1990
7. Presented 1/2 of the short course “Chemometrics” at the 1991 Federation of Analytical Chemistry and Spectroscopy Societies annual conference held in Anaheim, CA, October 7, 1991
8. Program Chairman, 1991 Student Meeting-In-Miniature November, 1991, East Carolina University
9. Program Chairman for Chemometrics, 1992 Federation of Analytical Chemistry and Spectroscopy Societies annual conference, Philadelphia PA

10. Program Chairman for Chemometrics and Near IR spectroscopy, 1997 Federation of Analytical Chemistry and Spectroscopy Societies annual conference held in Providence, RI., October 1997
11. Program Chairman for Chemometrics, 1998 Eastern Analytical Symposium to held in Sommerset, NJ., November, 1998
12. Industrial / Process Chemometrics session organizer and chair: Eighth International Conference on Chemometrics and Analytical Chemistry (CAC-2002), Seattle, WA, Sept. 2002
13. Chemometrics session organizer and chair: Seventeenth International Forum on Process Analytical Chemistry, Scottsdale, AZ, January 2003
14. Organizer of 8 chemometrics sessions and chair of chemometrics: 2004 Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Portland, OR, October 4 – 7, 2004

Editorial Boards

1. Chemometrics Series, CRC Press, Inc., Advisory Editor (1991 - 1993)
2. Member of the Editorial Advisory Board, *Analytica Chimica Acta*, Elsevier Science Publishers, (1994 - 1996)
3. Member of the Editorial Board, *Analytical Letters*, Marcel Dekker, Inc. (1995 - 2001)
4. Editorial Board, *Journal of Chemometrics*, John Wiley & Sons, Ltd. (1990 - 1995)
5. North American Editor, *Journal of Chemometrics*, John Wiley & Sons, Ltd. (1996 - 2001)
6. Editorial Board, *Journal of Chemometrics*, John Wiley & Sons, Ltd. (2001 - 2007)
7. Editorial Board, *Critical Reviews in Analytical Chemistry*, CRC Press, Inc. (2000 - 2005)

Consulting:

- 1993: Merck & Co., Inc
1995: Boehringer Mannheim, R & D
1995: Pfizer Central Research
1996: Philip Morris USA R&D
1996: Glaxo Wellcome Co
1997, 2003: Pfizer Central Research
2005: Bristol-Myer Squibb