

PAUL G. CONSTANTINE

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Updated 01/2017

APPOINTMENTS

COLORADO SCHOOL OF MINES, Golden, CO

Ben L. Fryrear Assistant Professor of Applied Mathematics and Statistics 08/2013—present
Named position included alumnus' gift to support two Ph.D. students for four years

STANFORD UNIVERSITY, Stanford, CA

Postdoctoral Researcher, Center for Turbulence Research 11/2011—08/2013

Consulting Assistant Professor of Mechanical Engineering 03/2011—06/2011

SANDIA NATIONAL LABORATORIES, Albuquerque, NM and Livermore, CA

John von Neumann Postdoctoral Research Fellow in Computational Science 10/2009—10/2011

EDUCATION

STANFORD UNIVERSITY, Stanford, CA

Ph.D., Computational and Mathematical Engineering 09/2009
Thesis: *Spectral methods for parameterized matrix equations*
Committee: Gianluca Iaccarino (advisor), Parviz Moin, George Papanicolaou

M.S., Computational and Mathematical Engineering 06/2006

UNIVERSITY OF NORTH TEXAS, Denton, TX

B.A., Mathematics, Minor in Music 12/2002

WRITINGS

Google Scholar data (01/17/2017)

Citations: 750

h-index: 15

i10-index: 20

Books (1)

- 1 P. G. CONSTANTINE,
Active Subspaces: Emerging Ideas in Dimension Reduction for Parameter Studies,
SIAM, Philadelphia, 2015, Pages ix + 97.
<https://doi.org/10.1137/1.9781611973860>

Journal publications (22)

- 1 P. G. CONSTANTINE AND P. DIAZ,
Global sensitivity metrics from active subspaces,
Reliability Engineering & System Safety (In press), (2017).
<http://arxiv.org/abs/1510.04361>
- 2 J. L. JEFFERSON, R. M. MAXWELL, AND P. G. CONSTANTINE,
Exploring the sensitivity of photosynthesis and stomatal resistance parameters in a land surface model,
Journal of Hydrometeorology (In press), (2017).
<https://doi.org/10.1175/JHM-D-16-0053.1>

- 3 P. CONSTANTINE, R. HOWARD, A. GLAWS, Z. GREY, P. DIAZ, AND L. FLETCHER,
Python Active-subspaces Utility Library,
The Journal of Open Source Software, 1 (2016).
<https://doi.org/10.21105/joss.00079>
- 4 P. G. CONSTANTINE, C. KENT, AND T. BUI-THANH,
Accelerating Markov chain Monte Carlo with active subspaces,
SIAM Journal on Scientific Computing, 38 (2016), pp. A2779–A2805.
<https://doi.org/10.1137/15M1042127>
- 5 J. GILBERT, J. JEFFERSON, P. G. CONSTANTINE, AND R. MAXWELL,
Global spatial sensitivity of runoff to subsurface permeability using the active subspace method,
Advances in Water Resources, 92 (2016), pp. 30–42.
<https://doi.org/10.1016/j.advwatres.2016.03.020>
- 6 P. SESHADRI, P. CONSTANTINE, G. IACCARINO, AND G. PARKS,
A density-matching approach for optimization under uncertainty,
Computer Methods in Applied Mechanics and Engineering, 305 (2016), pp. 562–578.
<https://doi.org/10.1016/j.cma.2016.03.006>
- 7 M. BAUERHEIM, A. NDIAYE, P. CONSTANTINE, S. MOREAU, AND F. NICLOUD,
Symmetry breaking of azimuthal thermoacoustic modes: The UQ perspective,
Journal of Fluid Mechanics, 789 (2016), pp. 534–566.
<https://doi.org/10.1017/jfm.2015.730>
- 8 P. G. CONSTANTINE, M. EMORY, J. LARSSON, AND G. IACCARINO,
Exploiting active subspaces to quantify uncertainty in the numerical simulation of the HyShot II scramjet,
Journal of Computational Physics, 302 (2015), pp. 1–20.
<https://doi.org/10.1016/j.jcp.2015.09.001>
- 9 J. L. JEFFERSON, J. M. GILBERT, P. G. CONSTANTINE, AND R. M. MAXWELL,
Active subspaces for sensitivity analysis and dimension reduction of an integrated hydrologic model,
Computers & Geosciences, 83 (2015), pp. 127–138.
<https://doi.org/10.1016/j.cageo.2015.07.001>
- 10 P. G. CONSTANTINE, B. ZAHARATOS, AND M. CAMPANELLI,
Discovering an active subspace in a single-diode solar cell model,
Statistical Analysis and Data Mining: The ASA Data Science Journal, 8 (2015), pp. 264–273.
<https://doi.org/10.1002/sam.11281>
- 11 P. G. CONSTANTINE, D. F. GLEICH, Y. HOU, AND J. TEMPLETON,
Model reduction with MapReduce-enabled tall and skinny singular value decomposition,
SIAM Journal on Scientific Computing, 36 (2014), pp. S166–S191.
<https://doi.org/10.1137/130925219>
- 12 P. G. CONSTANTINE, E. DOW, AND Q. WANG,
Active subspace methods in theory and practice: Applications to kriging surfaces,
SIAM Journal on Scientific Computing, 36 (2014), pp. A1500–A1524.
<https://doi.org/10.1137/130916138>
- 13 P. G. CONSTANTINE, E. T. PHIPPS, AND T. M. WILDEY,
Efficient uncertainty propagation for network multiphysics systems,
International Journal for Numerical Methods in Engineering, 99 (2014), pp. 183–202.
<https://doi.org/10.1002/nme.4667>
- 14 R. V. FIELD JR., P. CONSTANTINE, AND M. BOSLOUGH,
Statistical surrogate models for prediction of high-consequence climate change,
International Journal for Uncertainty Quantification, 3 (2013), pp. 341–355.
<https://doi.org/10.1615/Int.J.UncertaintyQuantification.2012003829>

- 15 P. G. CONSTANTINE AND Q. WANG,
Residual minimizing model interpolation for parameterized nonlinear dynamical systems,
SIAM Journal on Scientific Computing, 34 (2012), pp. A2118–A2144.
<https://doi.org/10.1137/100816717>
- 16 P. G. CONSTANTINE AND E. T. PHIPPS,
A Lanczos method for approximating composite functions,
Applied Mathematics and Computation, 218 (2012), pp. 11751–11762.
<https://doi.org/10.1016/j.amc.2012.05.009>
- 17 P. G. CONSTANTINE, M. S. ELDRED, AND E. T. PHIPPS,
Sparse pseudospectral approximation method,
Computer Methods in Applied Mechanics and Engineering, 229-232 (2012), pp. 1–12.
<https://doi.org/10.1016/j.cma.2012.03.019>
- 18 T. BUTLER, P. G. CONSTANTINE, AND T. WILDEY,
A posteriori error analysis of parameterized linear systems using spectral methods,
SIAM Journal on Matrix Analysis and Applications, 33 (2012), pp. 195–209.
<https://doi.org/10.1137/110840522>
- 19 P. G. CONSTANTINE, D. F. GLEICH, AND G. IACCARINO,
A factorization of the spectral Galerkin system for parameterized matrix equations: Derivation and applications,
SIAM Journal on Scientific Computing, 33 (2011), pp. 2995–3009.
<https://doi.org/10.1137/100799046>
- 20 P. G. CONSTANTINE, D. F. GLEICH, AND G. IACCARINO,
Spectral methods for parameterized matrix equations,
SIAM Journal on Matrix Analysis and Applications, 31 (2010), pp. 2681–2699.
<https://doi.org/10.1137/090755965>
- 21 P. G. CONSTANTINE AND D. F. GLEICH,
Random alpha PageRank,
Internet Mathematics, 6 (2009), pp. 189–236.
<https://doi.org/10.1080/15427951.2009.10129185>
- 22 P. G. CONSTANTINE, A. DOOSTAN, AND G. IACCARINO,
A hybrid collocation/Galerkin scheme for convective heat transfer problems with stochastic boundary conditions,
International Journal for Numerical Methods in Engineering, 80 (2009), pp. 868–880.
<https://doi.org/10.1002/nme.2564>

Refereed conference papers (18)

- 1 Z. DEL ROSARIO, P. CONSTANTINE, AND G. IACCARINO,
Developing design insight through active subspaces, in
19th AIAA Non-Deterministic Approaches Conference, Grapevine, TX, 2017, pp. 1–16.
<https://doi.org/10.2514/6.2017-1090>
- 2 Z. GREY AND P. CONSTANTINE,
Active subspaces of airfoil shape parameterizations, in
58th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Grapevine, TX, 2017,
pp. 1–18.
<https://doi.org/10.2514/6.2017-0507>
- 3 J. J. ALONSO, M. S. ELDRED, P. CONSTANTINE, K. DURAISAMY, C. FARHAT, G. IACCARINO, AND
J. JAKEMAN,
Scalable environment for quantification of uncertainty and optimization in industrial applications (SEQUOIA), in
19th AIAA Non-Deterministic Approaches Conference, Grapevine, TX, 2017, pp. 1–19.
<https://doi.org/10.2514/6.2017-1327>
- 4 C. OTHMER, T. W. LUKACZYK, P. CONSTANTINE, AND J. J. ALONSO,
On active subspaces in car aerodynamics, in
17th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Washington D.C., 2016, pp. 1–13.
<https://doi.org/10.2514/6.2016-4294>

- 5 P. G. CONSTANTINE, A. EFTEKHARI, AND M. B. WAKIN,
Computing active subspaces efficiently with gradient sketching, in
2015 IEEE 6th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Cancun, 2015, pp. 353–356.
<https://doi.org/10.1109/CAMSAP.2015.7383809>
- 6 T. W. LUKACZYK, P. CONSTANTINE, F. PALACIOS, AND J. J. ALONSO,
Active subspaces for shape optimization, in
10th AIAA Multidisciplinary Design Optimization Conference, National Harbor, 2014, pp. 1–18.
<https://doi.org/10.2514/6.2014-1171>
- 7 P. SESHADRI, P. CONSTANTINE, AND G. IACCARINO,
Aggressive design under uncertainty, in
16th AIAA Non-Deterministic Approaches Conference, National Harbor, 2014, pp. 1–12.
<https://doi.org/10.2514/6.2014-1007>
- 8 P. G. CONSTANTINE, M. EMORY, F. PALACIOS, N. KSEIB, AND G. IACCARINO,
Quantification of margins and uncertainties using an active subspace method for approximating bounds, in
11th International Conference on Structural Safety & Reliability, New York, 2013, pp. 823–827.
<https://doi.org/10.1201/b16387-119>
- 9 P. SESHADRI, P. CONSTANTINE, P. GONNET, AND G. T. PARKS,
Sparse robust rational interpolation for parameter-dependent aerospace models, in
54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, 2013,
pp. 1–13.
<https://doi.org/10.2514/6.2013-1680>
- 10 P. G. CONSTANTINE AND D. F. GLEICH,
Distinguishing signal from noise in an SVD of simulation data, in
2012 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Kyoto, 2012,
pp. 5333–5336.
<https://doi.org/10.1109/ICASSP.2012.6289125>
- 11 P. G. CONSTANTINE AND D. F. GLEICH,
Tall and skinny QR factorizations in MapReduce architectures, in
2nd International Workshop on MapReduce and Its Applications, San Jose, 2011, pp. 43–50.
<https://doi.org/10.1145/1996092.1996103>
- 12 P. CONSTANTINE, Q. WANG, A. DOOSTAN, AND G. IACCARINO,
A surrogate accelerated Bayesian inverse analysis of the HyShot II flight data, in
52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Denver, 2011,
pp. 1–9.
<https://doi.org/10.2514/6.2011-2037>
- 13 Q. WANG, H. CHEN, R. HU, AND P. CONSTANTINE,
Conditional sampling and experiment design for quantifying manufacturing error of transonic airfoil, in
49th AIAA Aerospace Sciences Meeting, Orlando, 2011, pp. 1–17.
<https://doi.org/10.2514/6.2011-658>
- 14 D. F. GLEICH, P. G. CONSTANTINE, A. D. FLAXMAN, AND A. GUNAWARDANA,
Tracking the random surfer: Empirically measured teleportation parameters in PageRank, in
19th International Conference on World Wide Web (WWW '10), Raleigh, 2010, pp. 381–390.
<https://doi.org/10.1145/1772690.1772730>
- 15 G. IACCARINO AND P. CONSTANTINE,
Large eddy simulations of flow around a cylinder with uncertain wall heating, in
47th AIAA Aerospace Sciences Meeting, Orlando, 2009, pp. 1–12.
<https://doi.org/10.2514/6.2009-975>
- 16 P. CONSTANTINE, A. DOOSTAN, AND G. IACCARINO,
A hybrid uncertainty propagation scheme for convective heat transfer problems, in
10th AIAA Non-Deterministic Approaches Conference, Schaumburg, 2008, pp. 1–9.
<https://doi.org/10.2514/6.2008-1723>

- 17 M. ELDRED, C. WEBSTER, AND P. CONSTANTINE,
Evaluation of non-intrusive approaches for Wiener-Askey generalized polynomial chaos, in
10th AIAA Non-Deterministic Approaches Conference, Schaumburg, 2008, pp. 1–22.
<https://doi.org/10.2514/6.2008-1892>
- 18 P. G. CONSTANTINE AND D. F. GLEICH,
Using polynomial chaos to compute the influence of multiple random surfers in the PageRank model, in
5th Workshop on Algorithms and Models for the Web Graph (WAW), San Diego, 2007, pp. 82–95.
https://doi.org/10.1007/978-3-540-77004-6_7

Book chapters (1)

- 1 D. F. GLEICH AND P. G. CONSTANTINE,
Ranking web pages, in *The Princeton Companion to Applied Mathematics*, N. J. Higham, ed.,
Princeton University Press, 2015, pp. 755–757

Patents (1)

- 1 P. CONSTANTINE AND D. GLEICH,
Systems and methods for ranking nodes of a graph using random parameters,
<http://google.com/patents/US8972329>.
US Patent 8,972,329, Issued 2015

Submitted (7)

- 1 A. GLAWS, P. G. CONSTANTINE, J. SHADID, AND T. M. WILDEY,
Dimension reduction in MHD power generation models: dimensional analysis and active subspaces,
arXiv:1609.01255, (2016).
<https://arxiv.org/abs/1609.01255>
- 2 P. G. CONSTANTINE AND A. DOOSTAN,
Time-dependent global sensitivity analysis with active subspaces for a lithium ion battery model,
arXiv:1606.08770, (2016).
<https://arxiv.org/abs/1606.08770>
- 3 P. G. CONSTANTINE, A. EFTEKHARI, AND R. WARD,
A near-stationary subspace for ridge approximation,
arXiv:1606.01929, (2016).
<http://arxiv.org/abs/1606.01929>
- 4 P. G. CONSTANTINE, Z. DEL ROSARIO, AND G. IACCARINO,
Many physical laws are ridge functions,
arXiv:1605.07974, (2016).
<http://arxiv.org/abs/1605.07974>
- 5 P. DIAZ, P. CONSTANTINE, K. KALMBACH, E. JONES, AND S. PANKAVICH,
A modified SEIR model for the spread of Ebola in Western Africa and metrics for resource allocation,
arXiv:1603.04955, (2016).
<http://arxiv.org/abs/1603.04955>
- 6 K. STINSON, D. F. GLEICH, AND P. G. CONSTANTINE,
A randomized algorithm for enumerating zonotope vertices,
arXiv:1602.06620, (2016).
<http://arxiv.org/abs/1602.06620>
- 7 P. G. CONSTANTINE AND D. F. GLEICH,
Computing active subspaces with Monte Carlo,
arXiv:1408.0545, (2015).
<http://arxiv.org/abs/1408.0545>

Reports (10)

- 1 M. BAUERHEIM, A. NDIAYE, P. CONSTANTINE, G. IACCARINO, S. MOREAU, AND F. NICLOUD,
Uncertainty quantification of thermo-acoustic instabilities in annular combustors,
Center for Turbulence Research Proceedings of the Summer Program, (2014), pp. 209–218.
https://web.stanford.edu/group/ctr/Summer/SP14/06_Combustion/11_bauerheim.pdf
- 2 O. MARXEN, G. SERINO, F. PINNA, P. CONSTANTINE, C. GORLE, AND G. IACCARINO,
Statistical inverse analysis and stochastic modeling of transition,
Center for Turbulence Research Proceedings of the Summer Program, (2012), pp. 189–198.
https://web.stanford.edu/group/ctr/Summer/SP12/03.01_marxen.pdf
- 3 D. LUCOR, J. WITTEVEEN, P. CONSTANTINE, D. SCHIAVAZZI, AND G. IACCARINO,
Comparison of adaptive uncertainty quantification approaches for shock wave-dominated flows,
Center for Turbulence Research Proceedings of the Summer Program, (2012), pp. 219–228.
https://web.stanford.edu/group/ctr/Summer/SP12/03.04_lucor.pdf
- 4 J. URZAY, N. KSEIB, P. G. CONSTANTINE, D. F. DAVIDSON, AND G. IACCARINO,
Uncertainty-quantifying models for chemical-kinetic rates,
Center for Turbulence Research Annual Research Briefs, (2012), pp. 3–16.
https://web.stanford.edu/group/ctr/ResBriefs/2012/01_urzay1.pdf
- 5 P. CONSTANTINE AND G. IACCARINO,
Reduced order models for parameterized hyperbolic conservation laws with shock reconstruction,
Center for Turbulence Research Annual Research Briefs, (2012), pp. 115–126.
https://web.stanford.edu/group/ctr/ResBriefs/2012/10_paulcon1.pdf
- 6 P. CONSTANTINE, Q. WANG, AND G. IACCARINO,
A method for spatial sensitivity analysis,
Center for Turbulence Research Annual Research Briefs, (2012), pp. 323–331.
https://web.stanford.edu/group/ctr/ResBriefs/2012/28_paulcon2.pdf
- 7 G. BACKUS, M. BOSLOUGH, T. BROWN, X. CAI, S. CONRAD, P. CONSTANTINE, K. DALBEY,
B. DEBUSSCHERE, R. FIELDS, D. HART, E. KALININA, A. KERSTEIN, M. LEVY, T. LOWRY, L. MALCZYNSKI,
H. NAJM, J. OVERFELT, M. J. PARKS, W. J. PEPLINSKI, C. SAFTA, K. SARGSYAN, W. STUBBLEFIELD,
M. A. TAYLOR, V. TIDWELL, T. TRUCANO, AND D. VILLA,
Risk assessment of climate systems for national security,
Sandia Report SAND2012-10554, (2012), pp. 1–121.
<https://doi.org/10.2172/1088102>
- 8 P. G. CONSTANTINE, A. DOOSTAN, Q. WANG, AND G. IACCARINO,
A surrogate accelerated Bayesian inverse analysis of the HyShot II supersonic combustion data,
Center for Turbulence Research Proceedings of the Summer Program, (2010), pp. 5–14.
https://web.stanford.edu/group/ctr/Summer/SP10/1_01_constantine.pdf
- 9 R. PEČNIK, P. CONSTANTINE, F. HAM, AND G. IACCARINO,
A probabilistic framework for high-speed flow simulations,
Center for Turbulence Research Annual Research Briefs, (2008), pp. 3–17.
https://web.stanford.edu/group/ctr/ResBriefs08/1_pecnik_new.pdf
- 10 T. CHANTRASMI, P. G. CONSTANTINE, N. ETEMADI, G. IACCARINO, AND Q. WANG,
Uncertainty quantification in simple linear and nonlinear problems,
Center for Turbulence Research Annual Research Briefs, (2006), pp. 3–16.
https://web.stanford.edu/group/ctr/ResBriefs06/1_UQ.pdf

MONIES

Funding

- 1 J. J. ALONSO, M. S. ELDRED (LEAD PIs), P. G. CONSTANTINE, K. DURAISAMY, C. FARHAT, AND G. IACCARINO,
Scalable Environment for Quantification of Uncertainty and Optimization in Industrial Applications (SEQUOIA),
DARPA Enabling Quantification of Uncertainty in Physical Systems (EQUiPS), Award # 61074264-119754,
\$5,400,000 (2015–2018).
CSM portion: \$475,000
- 2 G. L. BRENECKA (PI), C. V. CIOBANU, P. CONSTANTINE, C. PACKARD, AND V. STEVANOVIC,
Computation Of Undiscovered Piezoelectrics and Linked Experiments for Design (COUPLED),
NSF Designing Materials to Revolutionize and Engineer our Future (DMREF), Award # DMR 1534503,
\$1,500,000 (2015–2019)
- 3 P. G. CONSTANTINE (PI), T. BUI-THANH, Y. MARZOUK, AND Q. WANG,
Active Subspace Methods for Data-Intensive Inverse Problems,
DOE Office of Science, Advanced Scientific Computing Research, Award # DE-SC0011077,
\$1,100,000 (2014–2017).
CSM portion: \$310,000
- 4 P. G. CONSTANTINE (PI),
Ben L. Fryrear Assistant Professorship,
Colorado School of Mines Foundation,
\$250,000 (2013–2017).
Supports two Ph.D. fellowships
- 5 P. G. CONSTANTINE (PI),
Colorado School of Mines Undergraduate Research Award,
Colorado School of Mines,
\$1,500 (2016–2017)

Awards

- 1 Outstanding Applied Mathematics and Statistics Faculty (2016)
- 2 Kavli Frontiers of Science Fellow (2016)
- 3 UT Ausin Institute for Computational Engineering and Sciences John Tinsley Oden Fellow (2015)
- 4 Stanford Institute for Computational and Mathematical Engineering Very Important Person (2014)
- 5 SIAM/NSF Early Career Travel Award (2014)
- 6 Oxford Numerical Analysis Group Visitor (2012)
- 7 Stanford Center for Turbulence Research Summer Program Fellowship (2010)
- 8 Franklin P. and Caroline M. Johnson Graduate Fellowship (2009)
- 9 World Congress on Computational Mechanics Travel Fellowship (2008)
- 10 Student Presentation Winner, US National Congress on Computational Mechanics (2007)
- 11 Stanford/Uppsala Summer School Fellowship (2007)

STUDENTS AND ADVISEES

Graduated students (4)

- 1 Brian Zaharatos, Ph.D. 05/2015
Co-advised with Luis Tenorio
Thesis: *Statistical Modeling of Photovoltaic Device Performance*
Lecturer at University of Colorado Boulder Applied Mathematics
Paul G. Constantine

- 2 Paul Diaz, M.S. 05/2016
Thesis: *Global sensitivity metrics from active subspaces with applications*
Ph.D. student at University of Colorado Boulder Aerospace Engineering
- 3 Robert Balkin, B.S. 12/2016
Funded by DOE ASCR project
Applying for Fall 2017 Ph.D. programs
- 4 Kerrek Stinson, B.S. 05/2016
Awarded Ryan Sayers Memorial Award for Undergraduate Research
Ph.D. student at Carnegie Mellon Department of Mathematical Sciences
- 5 Carson Kent, B.S. 05/2015
Awarded DOE Computational Science Graduate Fellowship, NSF Graduate Research Fellowship
Ph.D. student at Stanford's Institute for Computational and Mathematical Engineering

Postdoctoral advisees (1)

- 1 Jeffrey Hokanson, 10/2016—present
Ph.D. Computational and Applied Mathematics, Rice University, 08/2013
Funded by DARPA EQUiPS project

Current graduate students (3)

- 1 Andrew Glaws, Ph.D. expected 05/2018
Ben L. Fryrear Graduate Fellow
- 2 Zach Grey, Ph.D. expected 05/2019
Ben L. Fryrear Graduate Fellow
- 3 Shannon Craig, M.S. expected 05/2017

Undergraduate research assistants (3)

- 1 Ryan Howard, B.S. expected 05/2017
Funded by DOE ASCR project
- 2 Jonathan Helland, B.S. expected 05/2018
Funded by Colorado School of Mines Undergraduate Research Award program

Ph.D. committees (10)

- 1 Zhihui Zhu, Electrical Engineering, Advisor: Michael Wakin
- 2 Caitlin Collins, Hydrologic Science and Engineering, Advisor: Reed Maxwell
- 3 James Beisman, Hydrologic Science and Engineering, Advisor: Reed Maxwell
- 4 Han Chen (MIT), Aeronautics and Astronautics, Advisor: Qiqi Wang, Graduated 12/2016
- 5 Michael Teter, Operations Research with Engineering, Advisor: Alexandra Newman, Graduated 09/2016
- 6 James Gilbert, Hydrologic Science and Engineering, Advisor: Reed Maxwell, Graduated 09/2016
- 7 Jennifer Jefferson, Hydrologic Science and Engineering, Advisor: Reed Maxwell, Graduated 05/2016
- 8 Armin Eftekhari, Electrical Engineering and Computer Science, Advisor: Michael Wakin, Graduated 09/2015
- 9 Trent Lukaczyk (Stanford), Aeronautics and Astronautics, Advisor: Juan Alonso, Graduated 06/2015
- 10 Jennifer Nealy, Applied Mathematics and Statistics, Advisor: Jon Collis, Graduated 05/2015

Plenary lectures at international conferences (2)

- 1 International Conference on Adaptive Modeling and Simulation (ADMOS), June 2017. Verbania, Italy
- 2 6th Workshop on High-Dimensional Approximation, September 2015. Bonn, Germany

Invited university seminars (38)

- 1 University of Washington Applied Mathematics Seminar, October 2016. Seattle, WA
- 2 Simon Fraser University Mathematics Colloquium, October 2016. Vancouver, BC
- 3 University of Colorado Statistics, Optimization, and Machine Learning Seminar, August 2016. Boulder, CO
- 4 Princeton University Program in Applied and Computational Mathematics Colloquium, December 2015. Princeton, NJ
- 5 University of Colorado Applied Mathematics Seminar, December 2015. Boulder, CO
- 6 Purdue Computational Science and Engineering Seminar, November 2015. West Lafayette, IN
- 7 University of Delaware Department of Mathematical Sciences Applied Mathematics Seminar, November 2015. Newark, DE
- 8 University of Colorado Denver Center for Computational Mathematics Seminar, August 2015. Denver, CO
- 9 Stanford University Linear Algebra and Optimization Seminar, May 2015. Stanford, CA
Video: <https://youtu.be/GywMA1RblmE>
- 10 North Carolina State University Department of Mathematics Colloquium, December 2014. Raleigh, NC
- 11 University of Minnesota MnDRIVE Optimization and Control Seminar, November 2014. Minnesota, MN
- 12 University of Colorado Denver Center for Computational Mathematics Seminar, October 2014. Denver, CO
- 13 University of Colorado Fluid Dynamics Seminar, October 2014. Boulder, CO
- 14 Colorado School of Mines Geophysics Heiland Lecture, August 2014. Golden, CO
- 15 Stanford University Department of Energy Resource Engineering Seminar, June 2014. Stanford, CA
- 16 Cambridge University Engineering Seminar, May 2014. Cambridge, UK
- 17 Purdue University PRISM Seminar, March 2014. West Lafayette, IN
- 18 University of North Texas Department of Mathematics Millican Colloquium, December 2014. Denton, TX
- 19 University of Texas at Austin Institute for Computational and Engineering Sciences Seminar, October 2014. Austin, TX
- 20 Colorado School of Mines Applied Mathematics and Statistics Colloquium, August 2013. Golden, CO
- 21 University of Maryland Computer Science Seminar, April 2013. College Park, MD
- 22 Colorado School of Mines Applied Mathematics and Statistics Colloquium, March 2013. Golden, CO
- 23 Massachusetts Institute of Technology Aerospace Computational Design Laboratory Seminar, December 2012. Cambridge, MA
- 24 Brown University Scientific Computing Seminar, December 2012. Providence, RI
- 25 Stanford University Linear Algebra and Optimization Seminar, November 2012. Stanford, CA
- 26 University of Warwick Applied Mathematics Seminar, September 2012. Coventry, UK
- 27 Cambridge University Engineering Seminar, September 2012. Cambridge, UK
- 28 Emory University Department of Computer Science Seminar, March 2012. Atlanta, GA
- 29 Oxford University Numerical Analysis Seminar, January 2012. Oxford, UK
- 30 Stanford University Linear Algebra and Optimization Seminar, October 2011. Stanford, CA

- 31 Stanford University Uncertainty Quantification Seminar, April 2011. Stanford, CA
- 32 Cornell University Structural Engineering Seminar, May 2011. Ithaca, NY
- 33 Rice University Computational and Applied Mathematics Seminar, February 2011. Houston, TX
- 34 Stanford University Department of Energy Resource Engineering Seminar, April 2010. Stanford, CA
- 35 University of Colorado Boulder Aerospace Engineering Department Seminar, April 2010. Boulder, CO
- 36 University of California Berkeley Scientific Computing Seminar, March 2010. Berkeley, CA
- 37 Stanford University Institute for Computational and Mathematical Engineering Colloquium, January 2010. Stanford, CA
- 38 Stanford University Linear Algebra and Optimization Seminar, October 2008. Stanford, CA

Invited conference presentations (44)

- 1 SIAM Annual Meeting, July 2016. Boston, MA
Video: https://www.pathlms.com/siam/courses/3028/sections/4117/video_presentations/31334
- 2 15th International Conference on Approximation Theory, May 2016. San Antonio, TX
- 3 SIAM Conference on Uncertainty Quantification, April 2016. Lausanne, Switzerland
- 4 Kavli Frontiers of Science, 20th German-American Symposium, March 2016. Potsdam, Germany
Video: <https://vimeo.com/159629096>
- 5 SIAM Conference on Applied Linear Algebra, October 2015. Atlanta, GA
- 6 Rolls Royce Aerodynamic Design Optimisation Seminar (ADOS), November 2015. Derby, UK (via WebEx)
- 7 New Directions in Numerical Computation, In Celebration of Nick Trefethen's 60th Birthday, August 2015. Oxford, UK
- 8 13th US National Congress for Computational Mechanics, July 2015. San Diego, CA
- 9 SIAM Conference on Mathematical and Computational Issues in the Geosciences, July 2015. Stanford, CA
- 10 1st International Conference on Uncertainty Quantification in Computational Sciences and Engineering, May 2015. Creete Island, Greece
- 11 Applied Inverse Problems Conference (AIP2015), May 2015. Helsinki, Finland
- 12 SIAM Conference on Computational Science and Engineering, March 2015. Salt Lake City, UT
<https://youtu.be/AChSTZLDTUE>
- 13 National Renewable Energy Laboratory 3rd Workshop on Systems Engineering for Wind Energy, January 2015. Boulder, CO
- 14 Joint Mathematics Meeting, January 2015. San Antonio, TX
- 15 Colorado/Wyoming American Statistical Association Regional Meeting, October 2014. Denver, CO
- 16 SIAM Annual Meeting, July 2014. Chicago, IL
- 17 Spatial Statistics and Uncertainty Quantification on Supercomputers, May 2014. Bath, UK
- 18 SIAM Conference on Uncertainty Quantification, April 2014. Savannah, GA
Video: https://www.pathlms.com/siam/courses/478/sections/642/thumbnail_video_presentations/4791
- 19 SIAM Conference on Parallel Processing for Scientific Computing, February 2014. Portland, OR
- 20 Conference on Data Analysis, March 2014. Santa Fe, NM
- 21 DOE Workshop on Applied Mathematics Research for Exascale Computing, August 2013. Washington, DC
- 22 SIAM Annual Meeting, July 2013. San Diego, CA
- 23 11th International Conference on Structural Safety & Reliability (Theme talk), June 2013. New York, NY
- 24 SIAM Conference on Computational Science and Engineering, February 2013. Boston, MA
- 25 INFORMS Computing Society Conference, January 2013. Santa Fe, NM
Paul G. Constantine

- 26 Linear Algebra Aspects of Solving PDEs with Random Data, January 2012. Manchester, UK
- 27 Society for Exploration Geophysicists Annual Meeting, November 2012. Las Vegas, NV
- 28 Model Reduction for Parameterized Systems (MoRePaS) II, October 2012. Guenzburg, Germany
- 29 SIAM Conference on Uncertainty Quantification, April 2012. Raleigh, NC
- 30 10th US National Congress on Computational Mechanics, July 2011. Minneapolis, MN
- 31 International Council on Industrial and Applied Mathematics Conference, July 2011. Vancouver, Canada
- 32 SIAM Conference on Computational Science and Engineering, February 2011. Reno, NV
Video: https://live.blueskybroadcast.com/bsb/client/cl_default.asp?client=975312&ma_id=15916
- 33 SIAM Annual Meeting, July 2010. Pittsburgh, PA
- 34 Copper Mountain Conference on Iterative Methods, April 2010. Copper Mountain, CO
- 35 SIAM Conference on Linear Algebra and Applications, September 2009. Monterey, CA
- 36 Model Reduction for Parameterized Systems (MoRePaS), September 2009. Muenster, Germany
- 37 GAMM Workshop on Numerical Linear Algebra, September 2009. Zurich, Switzerland
- 38 Dolomites Workshop on Constructive Approximation and Applications, September 2009. Canazei, Italy
- 39 SIAM Conference on Computational Science and Engineering, March 2009. Miami, FL
- 40 Opportunities and Challenges in Applying Polynomial Chaos Expansions to Engineering Design and Analysis, August 2008. Los Angeles, CA
- 41 8th World Congress on Computational Mechanics, July 2008. Venice, Italy
- 42 10th AIAA Non-Deterministic Approaches Conference, April 2008. Schaumburg, IL
- 43 Workshop on Algorithms for the Web Graph, December 2007. San Diego, CA
- 44 9th US National Congress on Computational Mechanics, July 2007. San Francisco, CA

National laboratory presentations (14)

- 1 Lawrence Livermore National Laboratories Seminar, August 2016. Livermore, CA
- 2 National Renewable Energy Laboratories Seminar, July 2016. Golden, CO
- 3 Sandia National Laboratories Seminar, November 2014. Livermore, CA
- 4 Sandia National Laboratories Computer Science Research Institute Seminar, July 2014. Albuquerque, NM
- 5 Argonne National Laboratory LANS Seminar, March 2014. Argonne, IL
- 6 National Center for Atmospheric Research IMAGE Seminar, March 2014. Boulder, CO
Video: http://video.ucar.edu/mms/image/paul_constantine.mp4
- 7 National Renewable Energy Labs Computational Science Center Seminar, December 2013. Golden, CO
- 8 Sandia National Laboratories Seminar, April 2013. Livermore, CA
- 9 Los Alamos National Labs Statistical Sciences Seminar, April 2013. Los Alamos, NM
- 10 Sandia National Laboratories Computer Science Research Institute Seminar, April 2013. Albuquerque, NM
- 11 Institut National de Recherche en Informatique et en Automatique (INRIA) Seminar, January 2012. Bordeaux, France
- 12 Sandia National Laboratories von Neumann Research Seminar, October 2011. Albuquerque, NM
- 13 Sandia National Laboratories Computer Science Research Institute Summer Student Seminar, June 2011. Albuquerque, NM
- 14 Sandia Presentation to DOE BER Program Committee, April 2010. Washington, DC

Invited short course lectures (5)

- 1 IMA New Directions Short Course, Introduction to Uncertainty Quantification, June 2015. Minneapolis, MN
Video: <https://www.ima.umn.edu/2014-2015/ND6.15-26.15/23788>
- 2 NC State University Modern Statistics for the Non-Specialist and Application to Materials and Chemistry Research, February 2015. Raleigh, NC
Video: <https://youtu.be/LTZQZY4SWEw>
- 3 Stanford Institute for Computational and Mathematical Engineering Xtend, Essential Concepts in Uncertainty Quantification, November 2014. Stanford, CA
- 4 NATO RTO-PSAAP-VKI Short Course on Uncertainty Quantification, Von Karman Institute, September 2014. Brussels, Belgium
- 5 NATO RTO-PSAAP-VKI Short Course on Uncertainty Quantification, Stanford University, June 2014. Stanford, CA

Posters (10)

- 1 SIAM Annual Meeting, E-poster, July 2016. Boston, MA
- 2 SIAM Conference on Uncertainty Quantification, Poster Blitz, April 2016. Lausanne, Switzerland
- 3 Conference on Data Analysis, March 2016. Santa Fe, NM
- 4 Institute for Computational and Experimental Research in Mathematics, October 2014. Providence, RI
- 5 DOE NNSA Predictive Science Academic Alliance Program Uncertainty Quantification Workshop, August 2012. Ann Arbor, MI
- 6 Conference on Data Analysis, February 2012. Santa Fe, NM
- 7 DOE Office of Science Applied Mathematics Meeting, October 2011. Reston, VA
- 8 SAMSI Workshop on Methods in Uncertainty Quantification, September 2011. Research Triangle Park, NC
- 9 SIAM Conference on Mathematical and Computational Issues in Geosciences, March 2011. Long Beach, CA
- 10 American Geophysical Union Fall Meeting, December 2010. San Francisco, CA

Public interest (3)

- 1 Denver Nerd Nite, August 2016. Denver, CO
Video: <https://youtu.be/h-0n1oSItHU>
- 2 Denver Nerd Nite, May 2014. Denver, CO
- 3 East Bay Nerd Nite, October 2013. Oakland, CA
Video: <https://youtu.be/6bUBjHG0Tt8>

TEACHING

Colorado School of Mines	Term	Units	Undergrads	Grads	Rating
MATH551 Computational Linear Algebra	S17	3	0	18	N/A
MATH408 Comp. Methods for Differential Equations	F16	3	18	3	4.87/5
MATH408 Comp. Methods for Differential Equations	S16	3	25	0	4.59/5
MATH307 Intro to Scientific Comp.	F15	3	39	0	4.65/5
MATH408 Comp. Methods for Differential Equations	S15	3	42	0	4.48/5
MATH598 Sensitivity Analysis	F14	3	1	8	4.95/5
MATH408 Comp. Methods for Differential Equations	S14	3	22	0	4.08/5
MATH598 Uncertainty Quantification	S14	1	0	7	4.29/5
MATH332 Linear Algebra	F13	3	34	0	3.80/4
Stanford University					
ME470 Uncertainty Quantification	S11	3	0	17	3.62/5

Training (1)

- 1 **National Effective Teaching Institute (NETI-1)**. Selected by Dean to participate in three-day workshop on effective teaching—e.g., course planning, lecturing, active learning, and assessment of learning, June 2016. New Orleans, LA

ORGANIZATION

Conferences and workshops, Chair or co-chair (5)

- 1 P. G. CONSTANTINE AND D. F. GLEICH,
SIAM Workshop on Parameter Space Dimension Reduction,
Pittsburgh, PA, July 2017
- 2 P. G. CONSTANTINE AND D. CARNEY,
Women in Data Science (WiDS) Mines,
Golden, CO, February 2017.
Satellite event for Women in Data Science Conference at Stanford University
- 3 P. G. CONSTANTINE AND D. F. GLEICH,
Stanford Institute for Computational and Mathematical Engineering Xchange,
Stanford, CA, July 2014.
Two-week research program with four participants
- 4 P. G. CONSTANTINE AND D. F. GLEICH,
2nd Institute for Computational and Mathematical Engineering MapReduce Workshop,
Stanford, CA, May 2013.
Three-day workshop, Six one-hour lectures, 12 participants
- 5 P. G. CONSTANTINE AND D. F. GLEICH,
Institute for Computational and Mathematical Engineering MapReduce Workshop,
Stanford, CA, May 2012.
Three-day workshop, Six one-hour lectures, 15 participants

Conferences and workshops, Committee member (2)

- 1 D. HIGHAM AND J. MUELLER (CHAIRS),
SIAM Annual Meeting,
Pittsburgh, PA, July 2017
- 2 K. MYERS AND E. LAWRENCE (CHAIRS),
3rd Conference on Data Analysis,
Santa Fe, NM, March 2016.
Three-day conference showcasing data applications across the DOE

Minisymposia (9)

- 1 P. G. CONSTANTINE,
Active Subspaces for Dimension Reduction in Functions of Many Variables,
SIAM Conference on Applied Linear Algebra, October 2015.
Four 30-minute talks
- 2 P. G. CONSTANTINE AND A. DOOSTAN,
Uncertainty Quantification Methods for Complex Mechanics Models,
13th US National Congress on Computational Mechanics, July 2015.
Eight 25-minute talks
- 3 P. G. CONSTANTINE,
Active Subspaces for Dimension Reduction: Theory and Applications,
SIAM Conference on Computational Science and Engineering, March 2015.
Twelve 30-minute talks

- 4 P. G. CONSTANTINE AND A. DOOSTAN,
Linear Algebra Aspects and Scalable Methods for Stochastic/parameterized Partial Differential Equations,
SIAM Annual Meeting, July 2014.
Eight 30-minute talks, Invited by SIAM Activity Group on Linear Algebra
- 5 P. G. CONSTANTINE, Y. MARZOUK, AND Q. WANG,
Active Subspace Methods for High-dimensional Approximation and Inverse Problems,
SIAM Conference on Uncertainty Quantification, April 2014.
Eight 30-minute talks
- 6 P. G. CONSTANTINE AND D. F. GLEICH,
Parallel Algorithms for MapReduce-Based Scientific Computing,
SIAM Conference on Parallel Processing for Scientific Computing, February 2014.
Eight 30-minute talks
- 7 Q. WANG, R. MOSER, AND P. G. CONSTANTINE,
Sensitivity Analysis and Uncertainty Quantification in Chaotic Systems,
SIAM Annual Meeting, July 2013.
Eight 30-minute talks
- 8 P. G. CONSTANTINE AND D. F. GLEICH,
Sensitivity Analysis and Uncertainty Quantification in Chaotic Systems,
SIAM Conference on Computational Science and Engineering, February 2013.
Four 30-minute talks
- 9 P. G. CONSTANTINE AND D. F. GLEICH,
Simulation Informatics: Applying Machine Learning Techniques To Simulation Databases,
SIAM Conference on Uncertainty Quantification, April 2012.
Four 30-minute talk

Short courses (1)

- 1 A. DOOSTAN AND P. G. CONSTANTINE,
Numerical Methods for Uncertainty Propagation,
13th US National Congress on Computational Mechanics, July 2015.
One-day workshop, gave three one-hour lectures, 18 participants

SERVICE

Editorial

- 1 Editorial Board, SIAM Computational Science and Engineering book series
- 2 Editorial Board, SIAM Fundamentals of Algorithms book series
- 3 Associate Editor, SIAM Journal of Scientific Computing Special Section, Software and Big Data in CSE

Review panelist

DOE Office of Science Advanced Scientific Computing Research, NSF Division of Mathematical Sciences

Proposal reviewer

DOE Office of Science Advanced Scientific Computing Research, Army Research Office Mathematics Division, DOE Energy Efficiency and Renewable Energy

Reviewer

Proceedings of the National Academies of Sciences, SIAM Books, SIAM Review, SIAM Journal of Scientific Computing, Computer Methods in Applied Mechanics and Engineering, SIAM/ASA Journal of Uncertainty Quantification, Linear Algebra and Applications, IMA Journal of Numerical Analysis, International Journal for Uncertainty Quantification, International Journal for Numerical Methods in Engineering, International Journal of Computational Mathematics, Applied Mathematics and Computation, Computational Geosciences, AIAA Journal, ACM Transactions on Parallel Computing, ACM Transactions on Mathematical Software, Journal of Propulsion and Power, Journal of the Mechanics and Physics of Solids, Advances in Water Resources, The American

Statistician, Advances in Space Research

Colorado School of Mines service

- 1 Applied Mathematics and Statistics Colloquium Coordinator, 2016–2017
- 2 Geophysics Search Committee for Tenure-track Computational Seismologist, 2015
- 3 Applied Mathematics and Statistics Outreach Committee, 2014–2017
- 4 Applied Mathematics and Statistics Graduate Admissions Committee, 2014

External service

- 1 SIAM Activity Group on Computational Science and Engineering, liason to SIAM News, 2017–2018
- 2 SIAM Career Opportunities Committee, 2015

Membership

Society for Industrial and Applied Mathematics

INDUSTRY

ORIX CAPITAL MARKETS , Dallas, TX Java Developer	10/2003 – 09/2004
WATSON WYATT & COMPANY , Dallas, TX Actuarial Analyst	01/2003 – 10/2003

WEB

Colorado School of Mines	inside.mines.edu/~pconstan
Active Subspaces project	activesubspaces.org
Google Scholar	scholar.google.com/citations?user=7x-Q4Y8AAAAJ&hl=en
Github	github.com/paulcon
Bitbucket	bitbucket.org/paulcon
Mathworks File Exchange	mathworks.com/matlabcentral/profile/authors/1073217-paul-constantine
Twitter	twitter.com/DrPaulynomial
Facebook	facebook.com/paul.g.constantine
LinkedIn	linkedin.com/in/paulconstantine
Speakerdeck	speakerdeck.com/paulcon
YouTube	youtube.com/c/paulcon