Curriculum Vitae

Victor Patrangenaru

March 13, 2023

Professional Preparation

1992-1998 Doctoral Degree(1998): Department of Mathematics: Concentration in Statistics, Indiana University, Bloomington.

1990-1992 Doctoral Degree(1994): Department of Mathematics: Differential Geometry, Haifa University, Israel.

Professional Experience

Since 2010 Professor - Department of Statistics, Florida State University.

2006 - 2010 Associate Professor - Department of Statistics, Florida State University.

2003 - 2006 Associate Professor - Department of Mathematics and Statistics, Texas Tech University.

1998 - 2003 Assistant Professor-Department of Mathematics and Statistics, Georgia State University.

Visiting Positions

Spring 2016 Research Fellow - Statistical and Applied Math Sciences Institute, Research Triangle, N. C. - Program : Challenges in Computational Neuroscience.

Spring 2014 Research Fellow - Statistical and Applied Mathematical Sciences Institute, Research Triangle, N. C. - Program : Low-dimensional Structure in High-dimensional Systems.

Fall 2010 Research Fellow - Statistical and Applied Mathematical Sciences Institute, Research Triangle, North Carolina - Program : Analysis of Object Data.

9/2007 Visiting Professor- Institute of Mathematical Stochastics, Georgia Augusta University, Göttingen, Germany. Host: Dr. Stephan Huckemann.

7/2002 Visiting Scholar- School of Mathematics and Statistics, University of Nottingham, Nottingham, United Kingdom. Host: Professor Ian Dryden.

1997 - 1998 Visiting Assistant Professor-Department of Mathematics, Indiana University-Purdue University, Ft. Wayne.

Honors and Awards

- *Dean's Travel Award*, College of Arts and Sciences, Florida State University, 2022.
- *Honored IMS Fellow*, Institute of Mathematical Statistics, since 2019.
- *Full salary on faculty sabbatical*, Florida State University, Spring 2014.
- *David Rothrock* Teaching Award, Indiana University, 1997.
- *Morris Pulver* (Canada) Dissertation Award, Haifa University, Israel, 1992.

TEACHING

Course Development at Florida State University

STA6557 *Object Data Analysis*.

Courses Taught at Florida State University

STA8985 *Dissertation Defense:* Spring 2023, Fall 2022, Summer 2021, Spring 2021, Spring 2020, Spring 2017, Summer 2017, Fall 2016, Fall 2015, Spring 2012, Summer 2011, Spring 2010

STA6980 *Dissertation:* Spring 2023, Fall 2022, Spring 2022, Fall 2021, Summer 2021, Spring 2021, Fall 2020, Summer 2020, Spring 2020, Fall 2019, Summer 2019, Spring 2019, Fall 2018, Summer 2018, Spring 2018, Fall 2017, Fall 2016, Spring 2016, Fall 2015, Summer 2015, Spring 2015, Spring 2014, Fall 2013, Summer 2013, Spring 2012, Spring 2011, Fall 2011, Spring 2009, Spring 2010, Summer 2010, Fall 2010, Fall 2009.

STA6906/5906 *Direction of Individual Study:* Spring 2022, Spring 2020, Fall 2019, Spring 2018, Spring 2014, Summer 2013, Summer 2011, Spring 2010, Spring 2009, Fall 2008, Summer 2008, Fall 2007, Summer 2007

STA6557 *Object Data Analysis:* Spring 2022, Spring 2020, Spring 2018, Spring 2017, Spring 2015

STA6468 *Advanced Topics in Probability and Statistics (2-3)* Fall 2012

STA6448 *Advanced Probability and Inference II* Fall 2008

STA6246 *Advanced Topics in Applied Statistics* Spring 2008

STA5910 *Supervised Research,* Summer 2008

STA5208 *Linear Statistical Models:* Spring 2009, Spring 2010

STA5746 *Multivariate Analysis:* Fall 2006

STA5334 *Limit Theory of Statistics:* Spring 2023, Spring 2021, Spring 2019, Fall 2016, Fall 2015, Spring 2010, Fall 2008

STA5326 *Distribution Theory and Inference:* Fall 2011

STA5327 *Statistical Inference:* Spring 2012

STA4702/5707 *Applied Multivariate Analysis:* Fall 2022, Fall 2021, Fall 2020, Fall 2019, Fall 2018, Fall 2017, Fall 2016, Fall 2015, Fall 2014, Fall 2013, Spring 2013, Spring 2012, Spring 2011, Fall 2009, Fall 2008, Spring 2007, Fall 2007

STA4322/5325 *Mathematical Statistics:* Spring 2023, Spring 2022, Spring 2021, Spring 2020, Spring 2019, Spring 2018, Spring 2015

STA4321/5323 *Introduction to Mathematical Statistics:* Summer 2022, Summer 2021, Summer 2020, Summer 2019, Summer 2018, Summer 2017, Fall 2014, Fall 2013, Fall 2012, Summer 2008 , Fall 2007, Fall 2006

STA3032 *Probability and Statistics for Science and Engineering:* Summer 2007

STA2171 *Statistics for Biology:* Spring 2011

Current Students-2023

Student Name	Research Area	Program
Aaid Algahtani	*Nonparametric 2D Shape and 3D Projective Shape Analysis*	PhD Statist
Seunghee Choi	*Spherical Depth and Oriented Projective Shape Analysis*	PhD Statist
Adam Dixon	*T D A with Applications to Medical Imaging*	PhD Statist
Ka Chun Wong	*Advances in Projective Shape Analysis*	PhD Statist
Garett Ordway	*Functional Data Analysis*	PhD Statist

Chair of Doctoral Dissertation Supervisory Committees

Student Name	Abbreviated Dissertation Title	School	Defense Date
Roland Moore	*Analysis of Phylo Trees and Gene. Connect. to DILI*	F S U	06/15/2021
Hwiyoung Lee	*Extrinsic Analysis of Manifold Valued Data*	F S U	03/30/2021
Chen Shen	*TDA for Med. Imag. and RNA Data An. on Tree Spaces*	F S U	03/10/2021
Yifang Deng	*Percei. Color. An. and Nonpar. Regr. and Anti-Regr.*	F S U	04/10/2020
Yunfan Wang	*Infer. and Computat. Meth. for Obj. Data with Appl.*	F S U	03/30/2020
Ruite Guo	*Distr.on High.Dim.Obj.Sp. and Nonpar.Inf. for Loc.Par.*	F S U	06/14/2017
David Lester	*High Level Im. An. on Manif. via Pr. Sh. and 3D Refl. Sh.*	F S U	04/13/2017
K. David Yao	*Statistical Analysis on Object Spaces with Applications*	F S U	11/28/2016
Mingfei Qiu	*1-and 2-Sample Problems for Data on Hilbert Manif.*	F S U	11/10/2015
Daniel E. Osborne	*Nonpar. Data An. on Manif. and Appl. Med. Imag.*	F S U	2/29/2012
Leif A. Ellingson	*Shape An. of Planar Contours and Structural Proteomics*	F S U	5/26/2011
Michael A. Crane	*Nonparam. Estim. of 3D Proj. Shapes and Medical Imaging*	F S U	5/3/2010
S. M. Sugathadasa	*Affine and Projective Shape An. with Applications*	T T U	2/27/2006
A. W. Bandulasiri	*Statistical Shape Analysis in Medical Imaging*	T T U	6/28/2006

Most Recent Information on PhD Alumni advised

PhD Name	PhD Year	Current Affiliation	First Position
Roland Moore	2021	Department of Defense	Data Analyst
Hwiyoung Lee	2021	University of Maryland	Postdoc
Chen Shen	2021	University of Michigan	Postdoc
Yifang Deng	2020	Citibank - New York	Sr. Analyst
Yunfan Wang	2020	Boehringer Ingelheim	Sr. Statistician
Ruite Guo	2017	SunTrust	Quantitative Analyst
Kouadio David Yao	2016	Cincinnati Insurance Companies	Modeling Analyst I
Mingfei Qiu	2015	Fed Home Loan Bank of Atlanta	Sr. Quant R. Manag. Analy.
Daniel E. Osborne	2012	Fl Agricultural & Mech. University	Assoc. Prof.
Leif A. Ellingson	2011	Texas Tech University	Assoc. Prof.
Michael A. Crane	2010	Bayer Pharma AG	Biostatistician
S. M. Sugathadasa	2006	University of Dallas - Texas	Senior Lecturer
A. W. Bandulasiri	2006	Sam Houston State University	Professor

Member of Doctoral Dissertation Supervisory Committees

- Mehdi Abdi Anbouhi, Department of Mathematics, FSU (chair Washington Mio), defended 6/28/2022

- Linda Chaba, Swarthmore University, Kenya (chair Bernard Omolo), defended 5/5/2017

- Serdar Caglak, College of Education, FSU (chair Insu Paek), defended 10/28/2015

- Jonathan Bates, Department of Mathematics, FSU (chair Washington Mio), defended 3/26/2013

- Arturo Donate, Department of Computer Science, FSU (chair Xiuwen Liu), defended 6/24/2011.

- Yuhua Zhu, Department of Computer Science, FSU (chair Xiuwen Liu), defended 4/5/2010.

- Nikolay Balov, Department of Statistics, FSU (chair Anuj Srivastava), defended 3/25/2009.

- Margarita Velandia Parra, Department of Agricultural Economics, Texas Tech University (chair Roderick Rejesus), defended 3/11/2007

- Harshini Fitipange, Department of Mathematics and Statistics, Texas Tech University (chair Rob Paige), defended 5/10/2006

- Ali Khoujmane, Department of Mathematics and Statistics, Texas Tech University (chair Frits

Ruymgaart), defended 6/8/2005

- Ji Fei, Department of Animal and Food Sciences, Texas Tech University (chair Sung W. Kim), defended 10/13/2004

Chair of Master's Thesis Supervisory Committees

Student Name	Thesis or Report Title	School	Date
Jing Su	*MS in Applied Statistics*	F S U	12/13/2008
Akashdeep Singh	*Simulations of Distributions in SAS*	TTU	5/11/2006
Gordana Derado	*Statistical Methods in Image Analysis*	GSU	11/27/2000
Ray Pruett	*Nonparametric Image Analysis in 2D Scene Identification*	GSU	11/14/1999

Member on Undergraduate Honors Committees

- Connor Mooneyhan, Department of Mathematics, FSU (chair Eric Klassen-Mathematics), defended 04/24/2020

- John Allemeier, Department of Statistics, FSU (chair Fred Huffer), defended 12/04/2019

- Nohelia Orozco, Department of Biological Sciences, FSU (chair Randall Hughes - FSU-Coastal and Marine Biolab), defended 11/16/2012.

PUBLICATIONS

Books in Work

1. V. Patrangenaru and D.E. Osborne (2022). *Nonparametric Statistics for Data on Stratified Spaces with Applications to Imaging and Object Data Analysis*. Chapman&Hall/CRC. Under Contract.

2. R. L. Paige and V. Patrangenaru (2022). *Geometric-Topological Statistical Methods for the Analysis of Image Data with Applications*, Chapman&Hall/CRC. Under Contract.

Papers in Preparation or Submitted

1. A. Dixon, V. Patrangenaru and R. Moore(2022). Analysis on Stratified Spaces and an RNA Based Investigation of two SARS-CoV-2 Hypotheses. Submitted at *J. of Nonparametric Statistics*.

2. A. Algahtani and V. Patrangenaru (2023). Two Sample Test for Extrinsic Antimeans on Planar Kendall Shape Spaces with an Application to Medical Imaging -*submitted at Annals of Statistics*

3. H. Lee and V. Patrangenaru (2022). Extrinsic Kernel Ridge Regression Classifier for Kendall's Planar Shape Space. *to be submitted*.

4. V. Patrangenaru, Chen Shen and R. Moore (2022). CLT on Stratified Spaces with an Application to Phylogenies of SARS-CoV-2 Data Analysis. Submitted at *J. of Nonparametric Statistics*.

Books

1. R. N. Bhattacharya, Lizhen Lin and V. Patrangenaru (2016). *A Course in Mathematical Statistics and Large Sample Theory*, Springer, Statistics Series. New York, USA. ISBN 978-1-4939-4032-5.

2. V. Patrangenaru and L. A. Ellingson (2015). *Nonparametric Statistics on Manifolds and Their Applications to Object Data Analysis*. Chapman&Hall/CRC. ISBN-13: 978-1439820506, 541 pages

3. Patrangenaru, Victor. (1998). *Asymptotic statistics on manifolds and their applications.* Thesis (Ph.D.)Indiana University. 1998. 100 pp. ISBN: 978-0599-05137-9, ProQuest LLC-1998

4. Victor Patrangenaru. *Locally Homogeneous Riemannian and Pseudoriemannian Manifolds.* Thesis (Ph.D.)University of Haifa(Israel). 1994. 177 pp. ISBN: 979-8480-67805-5, ProQuest LLC - 2021

Refreed Journal Articles Accepted

1. R. Guo, H. Lee and V. Patrangenaru (2023). Test for Homogeneity of Random Objects on Manifolds with Applications to Biological Shape Analysis. *Sankhya A*. Accepted for publication.

Refereed Journal Articles Published

1. S. Choi, R. L. Paige and V. Patrangenaru(2022). Oriented Projective Shape Analysis. *BSG Proceedings* , **29**, 1–11. http://www.mathem.pub.ro/proc/bsgp-28/K29-ch-ZKP94.pdf

2. V. Patrangenaru and Y. Deng (2021). Extrinsic Regression and Anti-Regression on Projective Shape Manifolds. *Methodology and Computing in Applied Probability.* Methodol. Comput. Appl. Probab. **23**, no. 2, 629-646.

3. A. Dixon, V. Patrangenaru and C. Shen (2021). An Introduction to Topological Object Data Analysis. *BSG Proceedings*, **28**, 52–68. http://www.mathem.pub.ro/proc/bsgp-28/K28-di-ZKN76.pdf

4. D. E. Osborne and V. Patrangenaru (2020). Detecting statistical differences between average glaucoma indices of the eye recovered from virtual 3D reconstructions of the eye's optic nerve head using 2D stereo images. *Comm. Statist. Simulation Comput.* **49**, no. 8, 2193-2205

5. Y. Wang, V. Patrangenaru and R. Guo (2020). A Central Limit Theorem for Extrinsic Antimeans and Estimation of Veronese-Whitney Means and Antimeans on Planar Kendall Shape Spaces. *J. Multivariate Anal.* **178**, 104600.

6. M. Qiu, R. Paige and V. Patrangenaru (2019). A nonparametric approach to 3D projective shape analysis from digital camera images - II. *Journal of Applied Statistics.* **46**. 2677–2699.

7. V. Patrangenaru, P. Bubenik, R.Paige and D. Osborne (2019). Challenges in Topological Object Data Analysis . *Sankhya A: The Indian Journal of Statistics* **81**. 244–271.

8. Hwiyoung Lee, Vladimir Balan and V. Patrangenaru (2019). Anti-MANOVA and applications to 3D projective shape analysis. *BSG Proceedings*, **26**, 52–68. http://www.mathem.pub.ro/proc/bsgp-26/K26-le-ZG69.pdf

9. Y. Deng, V. Patrangenaru and V. Balan (2018). Antiregression on Manifolds with an Applications to 3D Projective Shape Analysis. *BSG Proceedings.* **25**, 34–44. http://www.mathem.pub.ro/proc/bsgp-25/K25-de-ZE85.pdf

10. L. Ellingson, D. Groisser, D. Osborne, V. Patrangenaru and A. Schwartzman (2017). Nonparametric Bootstrap of Sample Means of Positive-Definite Matrices with an Application to Diffusion-Tensor-Imaging Data Analysis. *Communications in Statistics - Simulation and Computation* **46**, 4851–4879.

11. V. Patrangenaru, R. Paige, K. D. Yao, M. Qiu and D. Lester (2016). Projective Shape Analysis of Contours and Finite 3D Configurations from Digital Camera Image. *Statistical Papers.* **57**,

1017–1040.

12. Sean Skwerer, Elizabeth Bullitt, Stephan Huckemann, Ezra Miller, Ipek Oguz, Megan Owen, Vic Patrangenaru, and J.S. Marron (2014). Tree-Oriented Analysis of Brain Artery Structure. *J. M. I. V.* **50**, 126–143.

13. V. Patrangenaru, M. Qiu and M. Buibas (2014). Two Sample Tests for Mean 3D Projective Shapes from Digital Camera Images. *MCAP*. **16**, 485–506

14. R. N. Bhattacharya and V. Patrangenaru (2014). Rejoinder of Discussion paper "Statistics on Manifolds and Landmarks Based Image Analysis: A Nonparametric Theory with Applications." *JSPI* **145**, 42–48.

15. R. N. Bhattacharya and V. Patrangenaru (2014). Statistics on Manifolds and Landmarks Based Image Analysis: A Nonparametric Theory with Applications. *JSPI* **145**, 1–22.

16. Thomas Hotz, Stephan Huckemann, Huiling Le, James S. Marron, Jonathan C. Mattingly, Ezra Miller, James Nolen, Megan Owen, Vic Patrangenaru and Sean Skwerer (2013). Sticky Central Limit Theorems on Open Books. *Annals of Applied Probability,* **23**, 2238–2258.

17. L. Ellingson, F. H. Ruymgaart and V. Patrangenaru (2013). Nonparametric Estimation of Means on Hilbert Manifolds and Extrinsic Analysis of Mean Shapes of Contours. *Journal of Multivariate Analysis.* **122**, 317–333.

18. D. Osborne, V. Patrangenaru, L. Ellingson, D. Groisser and A. Schwartzman. (2013). Nonparametric Two-Sample Tests on Homogeneous Riemannian Manifolds, Cholesky Decompositions and Diffusion Tensor Image Analysis. *Journal of Multivariate Analysis.* **119**, 163-175.

19. Vic Patrangenaru (2013). On the large subgroups of $O(n-1,1)$ and a result by Kowalsky and Witte. J. of Geom. and Phys. *Journal of Geometry and Physics* **64**, 61–63.

20. R. N. Bhattacharya, L. Ellingson, X. Liu and V. Patrangenaru and M. Crane (2012). Extrinsic Analysis on Manifolds is Computationally Faster than Intrinsic Analysis, with Applications to Quality Control by Machine Vision. *Applied Stochastic Models in Business and Industry.* **28**, 222–235.

21. M. Crane and V. Patrangenaru (2011). Random Change on a Lie Group and Mean Glaucomatous Projective Shape Change Detection From Stereo Pair Images. *Journal of Multivariate Analysis.* **102**, 225-237.

22. G. J. A. Amaral, I. L. Dryden, V. Patrangenaru and A.T.A. Wood (2010). Bootstrap confidence

regions for the planar mean shape. *Journal of Statistical Planning and Inference.* **140**, 3026-3034

23. V. Patrangenaru (2010) DISCUSSION: "Intrinsic Shape Analysis: Geodesic PCA For Riemannian Manifolds Modulo Isometric Lie Group Actions" by Huckemann, Munk and Hotz. *Statistica Sinica.* **20**, 79-83.

24. V. Patrangenaru, X. Liu and S. Sugathadasa (2010). Nonparametric 3D Projective Shape Estimation from Pairs of 2D Images - I, In Memory of W.P. Dayawansa. *Journal of Multivariate Analysis.* **101**, 11-31.

25. A. Bandulasiri, A. Gunathilaka, V. Patrangenaru, and F. Ruymgaart and H. W. Thompson (2009). Nonparametric Shape Analysis Methods in Glaucoma Detection.*International Journal of Statistical Sciences*, **9** (Special Issue) 135-149.

26. A. Bandulasiri, R.N. Bhattacharya and V. Patrangenaru (2009). Nonparametric Inference for Extrinsic Means on Size-and-(Reflection)-Shape Manifolds with Applications in Medical Imaging. *Journal of Multivariate Analysis.* **100** 1867-1882.

27. V. Balan, M. Crane, V. Patrangenaru and X. Liu (2009). Projective shape manifolds and coplanarity of landmark configurations. A nonparametric approach. *Balkan Journal of Geometry and Its Applications,* **14**, no. 1, 1-10.

28. D. Kobelo, V. Patrangenaru and R. Mussa (2008). Safety Analysis of Florida Urban Limited Access Highways with Special Focus on the Influence of Truck Lane Restriction Policy. *Transportation Engineering.* **134**, 297–306.

29. A. Munk, R. Paige, J. Pang, V. Patrangenaru and F. H. Ruymgaart (2008). The One and Multisample Problem for Functional Data with Applications to Projective Shape Analysis. *Journal of Multivariate Analysis.* **99**, 815-833.

30. K. V. Mardia and V. Patrangenaru (2005). Directions and Projective Shapes. *Annals of Statistics* **33**, 1666–1699.

31. R. N. Bhattacharya and V. Patrangenaru (2005). Large Sample Theory of Intrinsic and Extrinsic Sample Means on Manifolds- Part II, *Annals of Statistics.* **33**, 1211– 1245.

32. G. Derado, K.V. Mardia, V. Patrangenaru and H. W. Thompson (2004). A Shape Based Glaucoma Index for Tomographic Images. *Journal of Applied Statistics.* **31**, 1241– 1248.

33. V. Patrangenaru (2003). Lorentz Manifolds with the Three Largest Degrees of Symmetry, *Geometriae Dedicata.* **102** 25–33.

34. R. N. Bhattacharya and V. Patrangenaru (2003). Large Sample Theory of Intrinsic and Extrinsic Sample Means on Manifolds-Part I. *Annals of Statistics* **31** 1–29.

35. V. Patrangenaru (2002). On the 3D Riemannian Homogeneous Spaces of Positive Curvature, *Algebra Geometry and Applications Seminar Proceedings* **2**, 4-11.

36. R. N. Bhattacharya and V. Patrangenaru (2002). Nonparametric Estimation of Location and Dispersion on Riemannian Manifolds. *Journal of Statistical Planning and Inference* **108**, 23–35.

37. V. Patrangenaru (2002). Five Dimensional Strictly Locally Homogeneous Riemannian Manifolds. *Periodica Mathematica Hungarica* **45**, 123-129.

38. V. Patrangenaru and K.V. Mardia (2002). A Bootstrap Approach to Pluto's Origin. *Journal of Applied Statistics* **29**, 935– 943.

39. V. Patrangenaru (2001). New Large Sample and Bootstrap Methods on Shape Spaces in High Level Analysis of Natural Images. *Communications in Statistics Theory and Methods* **30**, 1675–1695.

40. V. Patrangenaru (1998). Constant Gravitational Fields and Redshift of Light. (1998) *Journal of Geometry and Physics.* **26**, 227–246.

41. V. Patrangenaru (1998). Three-dimensional Metrics with a Spherical Homogeneous Model. *Journal of Mathematical Physics.* **39**, 1189-1198.

42. V. Patrangenaru (1997). Geometry, Statistics and Decision Making in Gene Therapy. *Balkan Journal of Geometry and Its Applications.* **2**, 83–100.

43. V. Patrangenaru (1996). Classifying 3 and 4 dimensional Homogeneous Riemannian Manifolds by Cartan Triples. *Pacific Journal of Mathematics.* **173**. 511 - 532.

44. V. Patrangenaru (1995). Locally Homogeneous Pseudo-Riemannian Manifolds. *Journal of Geometry and Physics.* **17**, 59-72.

44. V. Patrangenaru (1994). Locally Homogeneous Riemannian Manifolds and Cartan Triples. *Geometriae Dedicata.* **50**, 143 – 164.

46. V. Patrangenaru (1985). Projective Methods in Euclidean Geometry (Romanian), *Gazeta Matematica A*, **27** , *3 - 4*, p. 128-135.

47. V. Patrangenaru (1984). S-manifolds as Hypersurfaces in Euclidean Spaces, *Revue Roumaine de Mathematiques Pures et Appliques.* **29**, 341 – 348.

48. V. Patrangenaru (1982). On the Homotopy Groups of M(n; p,q). *Revue Roumaine de Mathe-*

matiques Pures et Appliques, **27.** 77– 79.

49. V. Patrangenaru (1981). A Theorem of Lefschetz Type in a Complete Riemannian Manifold. *Studii si Cercetari Matematice.* **33**. 535– 539. *In Romanian. Abstract in English*

Invited Book Chapters

50. Chen Shen and V. Patrangenaru (2020). Topological Object Data Analysis Methods with an Application to Medical Imaging. In: G. Aneiros, I. Horova, M. Huškova, P. Vieu (Eds) *Functional and High-Dimensional Statistics and Related Fields. Contributions to Statistics. Springer.* 237–244.

51. V. Patrangenaru, K.D.Yao and R. Guo (2016). Extrinsic Means and Antimeans. In: Cao R., González Manteiga W., Romo J. (eds) *Nonparametric Statistics. Springer Proceedings in Mathematics & Statistics*, vol **175.** 161–178.

52. D. E. Osborne, V. Patrangenaru, M. Qiu and H. W. Thompson (2015). Nonparametric Data Analysis Methods in Medical Imaging. *Festschrift 'Geometry Driven Statistics' in honor of Kantilal V. Mardia, Eds. I. L. Dryden and J.T. Kent. 183 – 214. John Wiley and Sons*

53. L. Ellingson, H. Hendriks, V. Patrangenaru, P. San Valentin (2014). On the CLT on Low Dimensional Stratified Spaces. *Topics in Nonparametric Statistics. Editors: M.G. Akritas, S.N. Lahiri and D. N. Politis*, 227–239. Springer.

54. Rabi N. Bhattacharya, Marius Buibas, Ian L. Dryden, Leif A. Ellingson, David Groisser, Harrie Hendriks, Stephan Huckemann, Huiling Le, Xiuwen Liu, James S. Marron, Daniel E. Osborne, Vic Patrângenaru, Armin Schwartzman, Hilary W. Thompson, and Andrew T. A.Wood. (2013) Extrinsic data analysis on sample spaces with a manifold stratification. *Advances in Mathematics, Invited Contributions at the Seventh Congress of Romanian Mathematicians, Brasov, 2011*, Publishing House of the Romanian Academy (Editors: Lucian Beznea, Vasile Brînzanescu, Marius Iosifescu, Gabriela Marinoschi, Radu Purice and Dan Timotin), pp. 241–252.

Proceedings papers

55. D. E. Osborne, V. Patrangenaru and C. Burey (2018). Illustration of 3D Projective Shape and Kendall Shape Reconstruction from Digital Outputs. *Proceedings of J.S.M.* 2017, Baltimore, 2429–2437.

56. V. Patrangenaru, K.D.Yao and V. Balan (2016). 3D face analysis from digital camera images. *Proceedings of the 9-th International Conference of Differential Geometry and Dynamical Systems*

(DGDS-2015) October 8-11, 2015, Bucharest, Romania - BSG Proceedings **23**. 44–57.

57. V. Patrangenaru, R. Guo and K. D. Yao (2016). Nonparametric Inference for Location Parameters via Fréchet Functions. *2nd International Symposium on Stochastic Models in Reliability Engineering, Life Science and Operations Management (SMRLO), Beer Sheva, Israel.* (Edited by Frenkel, I and Lisnianski, A) 254–262.

58. M. Qiu, V. Patrangenaru, L. Ellingson (2014). How far is the Corpus Callosum of an Average Individual from Albert Einstein's? *Proceedings of COMPSTAT-2014, The 21st International Conference on Computational Statistics, Geneva, August 19-22* (Edited by Manfred Gilli, Gil Gonzalez-Rodriguez and Alicia Nieto-Reyes), 403 – 410.

59. L. Ellingson, F. H. Ruymgaart and V. Patrangenaru (2013). Data analysis on Hilbert manifolds and shapes of planar contours. *Statistical Models and Methods for non-Euclidean Data with Current Scientific Applications, The 32nd Leeds Annual Statistical Research Workshop 2nd-4th July 2013* (Edited K. V. Mardia and Jochen Voss), 23–27. Leeds, Leeds University Press.

60. V. Patrangenaru, M. A. Crane, X. Liu, X. Descombes, G. Derado, W. Liu, V. Balan, V. P. Patrangenaru, H. W. Thompson (2012). Methodology for 3D Scene Reconstruction from Digital Camera Images. *Proceedings of the International Conference of Differential Geometry and Dynamical Systems (DGDS-2011) October 6-9, 2011, Bucharest, Romania - BSG Proceedings* **19***, 110–124.*

61. M. Buibas, M. Crane, L. Ellingson and V. Patrangenaru (2012). A Projective Frame Based Shape Analysis of a Rigid Scene from Noncalibrated Digital Camera Imaging Outputs. In *JSM Proceedings, 2011, Miami, FL. Institute of Mathematical Statistics, pp.* 4730–4744.

62. D. Osborne, V. Patrangenaru, X. Liu and H. W. Thompson (2012). 3D Size-and-Reflection Shape Analysis for Planning Reconstructive Surgery of the Skull. In *JSM Proceedings, 2011, Miami, FL. Section on Nonparametric Statistics, pp.* 4838–4850.

63. A. Bandulasiri, V. Patrangenaru, J. Su, J. Zhang (2009) Applications of Nonparametric Statistics on Reflection Shape Manifolds and Reflection Size-and-Shape Manifolds. *Proceedings of the Joint Statistical Meetings 2008, Denver, CO.* 2769 - 2776.

64. V. Balan and V. Patrangenaru (2006). Geometry of Shape Spaces. In *Proceedings of the 5th conference of the Balkan Society of Geometers.* (Balan, Vladimir (ed.)). Bucharest, Geometry Balkan Press. 28-33.

65. R. Paige, V. Patrangenaru, F. H. Ruymgaart and W. Wang (2005). Analysis of Projective

Shapes of Curves using Projective Frames. In *Quantitative Biology, Shape Analysis, and Wavelets* (S. Barber, P.D. Baxter, K.V.Mardia, & R.E. Walls (Eds.)) 71-74, Leeds, Leeds University Press.

66. K. V. Mardia, V. Patrangenaru and S. Sugathadasa (2005). Protein Gels Matching. In *Quantitative Biology, Shape Analysis, and Wavelets.* (S. Barber, P.D. Baxter, K.V.Mardia, & R.E. Walls (Eds.)). 163-165. Leeds, Leeds University Press.

67. V. Patrangenaru and S. Sughatadasa (2005). A Covariance Formula for Shape Statistics on Grassmannians. *Proceedings of ICIA05 Conference,* Colombo, Sri Lanka. 441 - 445.

68. J. M. Lee, R. Paige, V. Patrangenaru and F. H. Ruymgaart (2004). Nonparametric Density Estimation on Homogeneous Spaces in High Level Image Analysis. In *Bioinformatics, Images, and Wavelets,* (R.G. Aykroyd, S. Barber, & K.V. Mardia (Eds.)) 37–40. Leeds, Leeds University Press.

69. V. Patrangenaru and V. P. Patrangenaru (2004). Mean Shapes, Image Fusion and Scene Reconstruction. In *Proceedings of The Conference of Applied Differential Geometry - Aristotle University of Thessaloniki, Greece* (Editor Gr.Tsagas) 230-242.

70. A. Bandulasiri and V. Patrangenaru (2005). Algorithms for Nonparametric Inference on Shape Manifolds, *Proceedings of the Joint Statistical Meetings 2005, Minneapolis, MN*, 1617-1622.

71. K.V.Mardia, V. Patrangenaru, G. Derado and V. P. Patrangenaru (2003). Reconstruction of Planar Scenes from Multiple Views Using Affine and Projective Shape. In *Proceedings of the 2003 Workshop on Statistical Signal Processing* 285-288.

72. V. Patrangenaru and K. V. Mardia (2003). Affine Shape Analysis and Image Analysis, *Proceedings of the Leeds Annual Statistics Research Workshop 2003* pp. 57-62.

73. V. Balan and V. Patrangenaru (2002). Equiharmonic Tori into Strictly Locally Homogeneous Spaces. In *Proceedings of "Bolyai 200" International Conference on Geometry and Toplogy* 39–46.

74. V. Patrangenaru, S. O. Belkasim and G. Derado (2002). Estimation of evolution curves in spaces of images. In *Functional and image data, bioinformatics and data mining* (Edited by R. G. Aykroyd, K. V. Mardia and P. McDonnell) 55–58. Leeds, Leeds University Press.

75. K. V. Mardia and V. Patrangenaru (2001). On Affine and Projective Shape Data Analysis, in *Functional and Spatial Data Analysis, Proceedings of the 20th Leeds Annual Statistics Research Workshop*, (edited by K.V. Mardia& R.G. Aykroyd) 39-45. Leeds, Leeds University Press.

76. K. V. Mardia, V. Patrangenaru, G. J. Davis and G. Derado (2001). Averaging Side View

Images of Almost Flat Spatial Scenes. In *Functional and Spatial Data Analysis. Proceedings of the 19th Leeds Annual Statistics Research Workshop*, (Edited by K.V. Mardia & R.G. Aykroyd) 46–54. Leeds University Press, Leeds.

77. V. Patrangenaru (1999). Moving Projective Frames and Spatial Scene Identification. In *Proceedings of the 18th LASR Workshop*. Edited by K.V.Mardia, R.G.Aykroyd and I.L. Dryden. 53–56, Leeds University Press, Leeds

78. V. Patrangenaru (1988). On E. Cartan's Method on Riemannian Homogeneous Spaces. In *Proceedings of the National Conference on Geometry and Topology (Tîrgoviste, 1986)* (Romanian) 219-222. Univ. Bucureşti, Bucharest

Refereed reviews published

79. V. Patrangenaru (2008). Review of : Statistics and analysis of shapes. Edited by Hamid Krim and Anthony Yezzi, Jr., Birkhauser Boston, Inc., Boston, MA, 2006. *J. Amer. Statist. Assoc.* **103**, no. 484, 1727 - 1728.

Additional publications published.

80. Morphometric approach to change detection in confocal scanning laser tomographic (CSLT) images of the optic nerve head (ONH). By: Thompson, HW; Patrangenaru, V; Mercante, D; et al. *INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE* Volume: 42, Issue: 4, Supplement: S, Pages: S117-S117, Meeting Abstract: 632, Published: MAR 15 2001

81. G. Amaral, I. L. Dryden, V. Patrangenaru and A.T.A. Wood (2004). Coverage Accuracy for Bootstrap Confidence Regions for Mean Shapes, *Technical Report. Division of Statistics*, Univ. of Nottingham, U.K.

82. V. Patrangenaru, H.W. Thompson and G. Derado, Large Sample and Bootstrap Methods on for 3D Shape Change with Applications to Detection of Glaucomatous Change in Images of the Optic Nerve Head, in *Abstracts of the Leeds Annual Statistics Research Workshop in honor of the 65th birthday of Professor K.V.Mardia*, p.30-33, 2000. http://www.maths.leeds.ac.uk/Statistics/workshop/leeds2000

83. V. Patrangenaru, Asymptotic Statistics on Manifolds, *Ph.D. Dissertation , Indiana University*, 1998.

84. V. Patrangenaru, On the Metric Classification of 3D Pseudoriemannian Geometries and the Homaloidal Conic Test, Sixth International Conference on Geometry, *Journal of Geometry*,**44** No 1/2 (1992), p. 16.

85. V. Patrangenaru, Locally Homogeneous Riemannian Manifolds and Pseudo-Riemannian Manifolds, *Ph.D. Dissertation , Haifa University*, 1992.

86. V. Patrangenaru, Invariants of Locally Homogeneous Pseudoriemannian Spaces, *Preprint Series in Mathematics no. 6, INCREST*- Bucharest, 1986.

Technical Reports.

87. Roland Moore, Vic Patrangenaru and Adam Dixon (2021). Investigating two possible Origins of SARS-CoV-2 - an RNA Analysis on Tree Spaces. *Tech report M1015. http://stat.fsu.edu/technical-reports.php.*

88. V. Patrangenaru and M. Qiu (2014). Neighborhood Hypothesis Testing for Mean Change on Infinite Dimensional Lie Groups and 3D Projective Shape Analysis of Contours. *Tech report M1014. http://stat.fsu.edu/technical-reports.php.*

89. K. D. Yao, V. Patrangenaru and M. Qiu (2014). 3D Face Differentiation and Recognition from Digital Camera Images Via Projective Shape. *Tech report M1013, posted at http://stat.fsu.edu/technical-reports.php.*

90. D. Lester, V. Patrangenaru and R. Guo (2013). Mean Reflection Shapes of Landmark Configurations in Large and Small Acrosterigma Magnum Clamshells. *Tech report M1009, posted at http://stat.fsu.edu/technical-reports.php.*

91. R. N. Bhattacharya and V. Patrangenaru (2012). Statistics on Manifolds and Landmarks Based Image Analysis: A Nonparametric Theory with Applications. *Tech report M1007, posted at http://stat.fsu.edu/technical-reports.php.*

92. Ellingson, L., Groisser, D., Osborne, D., Patrangenaru, V. and Schwartzman, A. (2012) Nonparametric Bootstrap of Sample Means of Positive-Definite Matrices with an Application to Diffusion-Tensor-Imaging Data Analysis. *Tech report M1005, posted at http://stat.fsu.edu/technical-reports.php.*

93. R. N. Bhattacharya, M. Buibaş, I. L. Dryden, L. A. Ellingson, D. Groisser, H. Hendriks, S. Huckemann, Huiling Le, X. Liu, J. S. Marron, D. E. Osborne, V. Pătrângenaru, A. Schwartzman, H. W. Thompson, A.T.A. Wood(2012). Extrinsic Data Analysis on Sample Spaces with a Manifold Stratification *Tech report M1003, posted at http://stat.fsu.edu/technical-reports.php.*

94. D. Osborne and V. Patrangenaru(2011). Nonparametric Two-Sample Tests on Homogeneous Riemannian Manifolds, Cholesky Decompositions and Dyslexia Detection from Diffusion Tensor

Imaging Outputs. *Tech report M1001, posted at http://stat.fsu.edu/technical-reports.php.*

95. L. Ellingson, F. Ruymgaart and Vic Patrangenaru Nonparametric Estimation for Extrinsic Mean Shapes of Planar Contours.(2010). *Florida State University-Department of Statistics, Tech Report M998.*

ArXiv-Articles Published

96. Aaid Algahtani, Vic Patrangenaru (2021). Two Sample Test for Extrinsic Antimeans on Planar Kendall Shape Spaces with an Application to Medical Imaging. *arXiv:2107.04230v2*

97. Chen Shen, Vic Patrangenaru, Roland Moore (2021). A Phylogenetic Trees Analysis of SARS-CoV-2. *arXiv:2106.06918v2*

98. V. Patrangenaru, Y. Deng (2020). Nonparametric Data Analysis on the Space of Perceived Colors. *arXiv:2004.03402*

99. H. Lee and V. Patrangenaru(2019). Extrinsic Kernel Ridge Regression Classifier for Planar Kendall Shape Space. *arXiv:1912.08202*

100. H. Lee and V. Patrangenaru (2019). Anti-MANOVA on Compact Manifolds with Applications to 3D Projective Shape Analysis. *arXiv:1909.00320*

101. Y. Wang and V. Patrangenaru (2018). Nonparametric Confidence Regions for Veronese-Whitney Means and Antimeans on Planar Kendall Shape Spaces *arXiv:1806.08683v2*

102. K. D. Yao, V. Patrangenaru and D. Lester (2017). 3D mean Projective Shape Difference for Face Differentiation from Multiple Digital Camera Images. *arXiv:1704.03106v2*

103. R. Guo and V. Patrangenaru (2017). Testing for the Equality of two Distributions on High Dimensional Object Spaces. *arXiv:1703.07856.*

104. V. Patrangenaru (2009). On Chapter Xii in Cartan's "Leçons sur la Géométrie des Espaces de Riemann". *http://arxiv.org/abs/0904.1256v1*

105. V. Patrangenaru, X. Liu and S. Sugathadasa. (2008) Nonparametric 3D Projective Shape Estimation from Pairs of 2D Images - I, In Memory of W.P. Dayawansa. *http://arxiv.org/abs/0806.0899*

Other Publications.

106. T. Hotz, S. Huchemann, Huiling Le and V. Patrangenaru (2011) Hyperbolic data analysis. Preprint, SAMSI-AOD Program. 2010-2011. Working Group: Data Analysis on Sample Spaces with a Manifold Stratification. (currently available to group members only)

107. K. Bharath, T. Hotz, S. Huckemann, Huiling Le, S. Marron, E. Miller, J. Moriarty, M. Owen,

V. Patrangenaru and S. Skwerer. (2010). Stickyness and CLT on the Spider Product. Preprint, SAMSI-AOD Program. 2010-2011. Working Group: Data Analysis on Sample Spaces with a Manifold Stratification. (currently available to group members only)

108. T. Hotz, S. Marron, J. Moriarty, V. Patrangenaru, Sean Skwerer, S. Huckemann and K. Bharat. (2010). Asymptotic Behaviour of Intrinsic Means on Stratified Spaces. Preprint, SAMSI-AOD Program. 2010-2011.(currently available to group members only)

Presentations

Invited Presentations at Conferences, Symposia, Colloquia :2008-present.

1. V. Patrangenaru.*TBD* Geometry, Object Oriented Data Analysis in Health Sciences, July 10-14, 2023, IMSI, Chicago, USA.

2. V. Patrangenaru and R.L. Paige. *RCD and TDA for 2D Scenes Extracted From Electronic Images*. AISC2022, Oct. 8-10, 2022, Greensboro, NC

3. V. Patrangenaru, R.L.Paige and A. Algahtani. *A statistical and topological data analysis of 2D and 3D scenes extracted from electronic images*. The XVIth International Conference DGDS-2022, University Politehnica of Bucharest, Romania. *September 1-3, 2022*, online.

4. V. Patrangenaru, Roland Moore and Chen Shen. *CLT on Stratified Spaces with an application to phylogenies of SARS-CoV-2 data analysis*. ISNPS2022 International Symposium on Nonparametric Statistics, *June 20-24, 2022*, Paphos, Cyprus.

5. S, Choi, R.L. Paige and V. Patrangenaru. *Oriented Projective Shape Analysis*. The XVth International Conference DGDS-2021, University Politehnica of Bucharest, Romania. *August 26-29, 2021*, online.

6. V. Patrangenaru and R. Moore.*Analysis on Stratified Spaces and an RNA Based Investigation of the SARS-CoV-2 Hypotheses*. 5th International Workshop on Functional and Operatorial Statistics-IWFOS 2021, *June 23-25, 2021*, online.

7. V. Patrangenaru. *Vision Data Science* -Keynote speaker. *Data Science Week-2020* Online Workshop. Organizer A. Selvitella (PFW, Indiana), Nov.30-Dec. 5,2020.

8. V. Patrangenaru. *Mathematics and Statistics for Data Extracted from Electronic Images.* Online colloquium talk at the Department of Mathematics and Statistics, Texas Tech University. October 26, 2020.

9. A. Dixon, V. Patrangenaru and C. Shen. *Introduction to TDA*. Online DGDS2020 Workshop, Organizer V. Balan, Politehnic Institute-Bucharest, Romania.

10. S. Choi, V. Patrangenaru and R. L. Paige. *Object Data Analysis*- Invited E-poster opening session, Denver, CO, July 27 - August 1, 2019.

11. V. Patrangenaru. *TDA Based Differentiation of Glioblastomas from Brain Images* 9th CRM, June 28 - July 3, 2019, Galati, Romania.

12. V. Patrangenaru. *Nonparametric extrinsic regression and anti-regression on projective shape manifolds*, *S4G*, Prague, Czech Republic, 25 June - 29 June 2018.

13. V. Patrangenaru. *Key aspects of high dimensional Object Data analysis.* IISA Meeting, University of Florida, May 15-19, 2018.

14. V. Patrangenaru. *Future of Statistics*, Geometry, Statistics and Data Analysis, University of California, Davis, May 19-20, 2017.

15. V. Patrangenaru. *Differential Topology and Object Data Analysis - Brand New Location Parameters on Compact Manifolds*, Topology Seminar, Université de Lille, France, June 24, 2016.

16. V. Patrangenaru. *Brand New Location Parameters on Compact Metric Spaces*, Third INSPS Conference, Avignon, France, June 11-16, 2016 INSPS Conference in Avignon, France (international)

17. V. Patrangenaru. *Data Analysis on Manifolds*, Statistical Analysis of Manifold-Valued Data and Beyond, April 4 - 6, 2016, University of Nottingham, UK, 2016 (international).

18. V. Patrangenaru. *Analysis of Big Data of Complex Systems*, University Politechnica Bucharest, Departments of Mathematics, March 8, 2016 (international).

19. V. Patrangenaru. *Nonparametric Inference for Location Parameters via Fréchet-Morse functions*, SMRLO'16, Shamoon College of Engineering, Beer Sheva, Israel, February 15-18, 2016 (international).

20. V. Patrangenaru. *Projective Shape Analysis of 3D Contours*, PROBASTAT 2015 - the 7th International Conference on Probability and Statistics, Smolenice Castle, Slovakia, June 29 - July 3, 2015 (international).

21. V. Patrangenaru. *Two Sample Tests on Lie Groups and Homogeneous Spaces with Examples*, CMR8 2015 - the 8th Congress of Romanian Mathematicians, Iasi, Romania, June 25 - July 1, 2015 (international).

22. V. Patrangenaru. *All of Statistics as far as Objects on Sample Spaces are Concerned*, Boston University, November 20, 2014 .

23. V. Patrangenaru, Mingfei Qiu and L. Ellingson. *How far the Corpus Callosum of an Average Individual from Albert Einstein's*, Compstat 2014, Geneva, Switzerland, Aug 19 - 22, 2014 (international).

24. V. Patrangenaru, Kouadio Yao, Mingfei Qiu, Ruite Guo and H. Hendriks. *Cartan Means and Cartan Anti-Means on Stratified Spaces*. Second Conference of the International Society for Nonparametric Statistics, June 2014, Cadiz, Spain (international).

25. V. Patrangenaru. *Data Analysis on Manifolds*. Workshop "Geometric Topological and Graphical Model Methods in Statistics". Fields Institute, Toronto, Canada, May 22-23, 2014 (international).

26. V. Patrangenaru *Data Analysis on Hilbert Manifolds*, SAMSI: LDHD Transition Workshop, May 12-14, 2014.

27. V. Patrangenaru, M. Qiu and L. Ellingson. *Neighborhood hypothesis testing for mean contour shapes of corpus callosum mid sections*, February 6, SAMSI:LDHD program: Topological Data Analysis, workshop, February 3-7, 2014.

28. V. Patrangenaru. *All We See are 3D Projective Shapes*, Distinguished Research Seminar Series, Department of Mathematics and Statistics Colloquium, and Special MICAMS Seminar, Missouri University of Science and Technology, April 5, 2013.

29. V. Patrangenaru. *Geometry and Nonparametric Bootstrap, Keys to Data Analysis* , Distinguished Research Seminar Series, Department of Mathematics and Statistics Colloquium, and Special MICAMS Seminar, Missouri University of Science and Technology, April 4, 2013.

30. V. Patrangenaru. *Data Analysis on Sample Spaces with a Manifold Stratification (from* 1 *to* ∞ *and from* ∞ *to* 1*)*, University of California Davis, November 29, 2012 .

31. V. Patrangenaru. *Geometro-Statistical Methods in Medical Imaging*, University Politehnica, Bucuresti, Romania, August 6, 2012.

32. V. Patrangenaru, M. Qiu and M. Buibas. *Two Sample Tests for 3D projective Shapes from Digital Camera Images*, 7^{th} International Conference on Stereology, Spatial Statistics and Stochastic Geometry, Prague, Czech Republic, 25 June - 28 June 2012.

33. V. Patrangenaru, Paul San Valentin, L. A. Ellingson, J. S. Marron and E. Miller. *CLT on*

One Dimensional Stratified Spaces, First Conference of the International Society for Nonparametric Statistics, June 15-19, Chalkidiki, Greece.

34. V. Patrangenaru. *Diffusion Tensor Imaging*, Seminar of Shape Analysis, University of North Carolina, April 13, 2012.

35. V. Patrangenaru. *Object Data Analysis*, Colloquium, Florida State University, Department of Statistics, September 2, 2011.

36. V. Patrangenaru. *Data Analysis on Sample Spaces with a Manifold Stratification*, Nonparametrics and Geometry, Charles University, Prague, The Czech Republic, August 15 - 19, 2011 (opening 35 min talk, international).

37. V. Patrangenaru, L. Ellingson and D. Osborne. *Analysis of Object Data is Data Analysis on Sample Spaces with a Manifold Stratification*, CRM, Bucharest, Romania, June 29 - July 5, 2011 (international).

38. V. Patrangenaru and L. Ellingson. *Analysis of Object Data is Data Analysis on Sample Spaces with a Manifold Stratification*, SAMSI, RTP, NC, June 10. At SAMSI AOD Transition Workshop, June, 9-11, 2011.

39. V. Patrangenaru *Statistical Analysis of Object Data*, University of South Carolina, Columbia, SC, February 3, 2011.

40. V. Patrangenaru *Working Group Extrinsic Data Analysis on Spaces that admit a Manifold Stratification* SAMSI AOOD Opening Workshop, Sept 14, 2010 (international).

41. V. Patrangenaru et. al. *Methodology for 3D Scene Reconstruction from Digital Camera Images* for "Image Analysis" International Society for Business and Industrial Statistics Conference, Portoroz, Slovenia, July 7, 2010 (international).

42. V. Patrangenaru et. al. *Extrinsic Analysis on Manifolds is Computationally Faster than Intrinsic Analysis, with Examples from Shape and Image Analysis* for "Methodologies for Post-Euclidean Statistics" International Society for Business and Industrial Statistics Conference, Portoroz, Slovenia, July 6, 2010 (international).

43. V. Patrangenaru *Statistics on Manifolds, key to Modern Data Analysis* - keynote presentation, SRCOS 2010, Summer Research Conference, Virginia Beach, VA, June 7, 2010 (international).

44. V. Patrangenaru *Nonparametric Statistical Analysis on Manifolds* University of California Davis, October 30, 2009 .

45. V. Patrangenaru *Asymptotic Statistics on Manifolds and Applications* Symposium on "New Directions in Asymptotic Statistics", May15-16, 2009 University of Georgia, Athens, GA.

46. V. Patrangenaru *Asymptotic Statistics, Nonparametric Bootstrap on Manifolds and Applications*, University of Maryland Baltimore County, March 27, 2009.

47. V. Patrangenaru *Statistical Analysis on Manifolds with Applications in Bioinformatics and Medical Imaging* BIRS Workshop on "Data Analysis using Computational Topology and Geometric Statistics", Banff, Canada , March 8-13, 2009.

48. V. Patrangenaru *Statistical Applications of Size-and-Shpe to Proteomics and Medical Imaging* LSUHSC School of Public Health - Section of Biostatistics , New Orleans, October 27, 2008.

49. V. Patrangenaru *Nonparametric Analysis of Projective Shapes with Applications to Scene Recognition* , SRCOS 2008: "Modern Semiparametric Methods in Action", Charleston, South Carolina, June 8-11, 2008.

50. V. Patrangenaru *Nonparametric Estimation of Projective Shapes of 3D Scenes from Bilateral Views* The 2008 Joint Meeting of the Statistical Society of Canada and the Société Française de Statistique (SFdS), Ottawa, May 27-29, 2008.

Contributed Presentations (since 2008)

1. V. Patrangenaru. *Statistics on open books with an application to SARS-Cov2 RNA analysis.* 2022 AISC Greenboro, October 7-9, 2022.

2. V. Patrangenaru. *Future of Statistics as far as Fundamental Research is Concerned.* 2019 ASA Florida Chapter Meeting, University of Central Florida Harris Corporation Engineering Center (HEC) 4000 Central Florida Blvd., Orlando, FL.

3. V. Patrangenaru, H. Hendriks and Mingfei Qiu. *Cartan Means and Cartan Anti-Means on Stratified Spaces* International Year of Statistics Conference, Florida State University, Nov 14-Nov 15, 2013 (national).

4. V. Patrangenaru, L. Ellingson and Mingfei Qiu. *Two sample tests for mean 3D projective shapes of surfaces from digital camera images* 29^{th} EMS 2013, July 20-25, Budapest, Hungary (international).

5. V. Patrangenaru, L. Ellingson and F. H. Ruymgaart. *Data Analysis on Hilbert Manifolds and Shapes of Planar Contours* 25 min presentation - LASR 2013 - Statistical Models and Methods for non-Euclidean Data with Current Scientific, July 2-4, Leeds, U. K. 2013 (international).

6. D. Groisser, D. Osborne, V. Patrangenaru and A. Schwartzman. *Data Analysis on Spaces of Positive Definite Matrices with an Application to Dyslexia Detection* One hour presentation - Working Group of Geometric Correspondence at SAMSI in the AOOD Program, May 5, 2011 (international).

7. Leif Ellingson (and Vic Patrangenaru)*Automatic Landmark Extraction for Planar Contours.* Two hour presentation - Working Group of Geometric Correspondence at SAMSI in the AOOD Program, Oct 7, 2010 (international).

8. Stephan Huckemann, Vic Patrangenaru et. al. *Hyperbolic Data Analysis.* One hour presentation - Working Group of Data Analysis on Spaces that admit a Manifold Stratification at SAMSI in the AOOD Program, Oct 6, 2010 (international).

9. Vic Patrangenaru *Data Analysis on Spaces with a Manifold Stratification and Applications.* Two - one hour presentations - Working Group of Data Analysis on Spaces that admit a Manifold Stratification at SAMSI in the AOOD Program, Sept 22 and Sept 29, 2010 (international).

10. Leif Ellingson and Vic Patrangenaru *Computational Advantages of Extrinsic Analysis on Manifolds over Intrinsic Analysis on Manifolds.* poster presented by Leif Ellingson at SAMSI AOOD Opening Workshop, Sept 13, 2010 (international).

11. Daniel Osborne, Victor Patrangenaru, Xiuwen Liu and Hillary W. Thompson *Virtual Skull Extraction from CT-Scans for Reconstructive Surgery.* poster presented by Daniel Osborne at SAMSI AOOD Opening Workshop, Sept 13, 2010 (international).

12. V. Patrangenaru *Applications of Nonparametric Statistics on Size-and-Shape Manifold.* Joint Statistical Meetings 2008, Denver, Colorado, August $4 - 7, 2008$.

National Grants Funding and Proposals

1. Victor Patrangenaru (PI) 5/26/2022 - 5/25/2025, NSF-DMS:2311059 *Collaborative Research: Advances in the Theory and Practice of NonEuclidean Data Analysis.* Submitted at the National Science Foundation.

2. Victor Patrangenaru (PI) 5/5/2015 - 5/4/2016, NSA-MSP-H98230-15-1-0227: *Nonparametric Statistical Analysis of Spatial Scenes from Digital Camera Images and from Medical Stereo Images.* Funded by the National Security Agency.

3. Victor Patrangenaru (PI) 7/1/2014 - 6/30/2016, NSA-MSP- H98230-14-1-0135: *Nonparametric Statistical Analysis of Spatial Scenes from Digital Camera Images.* Funded by the National Security

Agency.

4. Victor Patrangenaru (PI) 7/1/2011 - 6/30/2017, NSF-DMS-1106935: *Collaborative Research: Nonparametric Theory on Manifolds of Shapes and Images, with Applications to Biology, Medical Imaging and Machine Vision*. Continuing award funded by the National Science Foundation.

5. Victor Patrangenaru (PI) 7/1/2008 - 3/31/2013, NSF-DMS-0805977: *Collaborative Research: New Directions in Nonparametric Inference on Manifolds with Applications to Shapes and Images.* Funded by the National Science Foundation.

6. Victor Patrangenaru (PI) 6/1/2008 - 5/31/2010, MSP- H98230-08-1-0058: *Statistical Analysis on Manifolds and 3D Surface Identification from Noncalibrated Digital Camera Images*. Funded by the National Security Agency.

7. Victor Patrangenaru (PI) 8/9/2006 - 8/31/2007, DMS-0652353: *Collaborative Research: Statistical Analysis on Manifolds: a Nonparametric Approach for Inference on Shapes and Images*. Funded by the National Science Foundation.

8. Victor Patrangenaru (PI) Robert L. Paige (Co-PI), 11/01/2005 - 10/30/2006: DMS-0541993: *Red Raider Mini-Symposium 2005: Geometry and Statistics and Image Analysis*. Funded by the National Science Foundation.

9. Victor Patrangenaru (PI) 9/1/2004 - 8/9/2006, DMS-0406151: *Collaborative Research: Statistical Analysis on Manifolds: a Nonparametric Approach for Inference on Shapes and Images*. Funded by the National Science Foundation.

10. Victor Patrangenaru (PI) 6/1/2002 - 5/31/2004, MDA-904-02-1-0082:*Statistical Analysis on Manifolds with Applications in Image Analysis and in Pattern Recognition*. Funded by the National Security Agency.

SERVICE

Florida State University

University

UFF Senator, April, 2021 - date.

University Sabbatical Committee, August - November 15, 2019.

Peer-Reviewer, COFRS-FSU (2008-2009).

Department of Statistics

Chair, Computer Systems and Acquisitions Committee (9/2013-9/2023)

Committee Member, Curriculum Committee (9/2012-9/2013) Nonmember Expert for Student Exams Committee (9/2012-9/2013) Chair, Student Awards Committee (9/2011-9/2012)

Committee Member, Graduate Committee, (9/2006-9/2008)

Committee Member, Academic Affairs Committee, (9/2008-9/2011)

Texas Tech University

University

Judge for Texas Tech University - Graduate Student Research Competition, 2005.

Department of Mathematics and Statistics

Judge for Department of Mathematics and Statistics - Ph.D. Student Research Competition, 2004.

Judge for Contest at Emmy Noether High School Mathematics Day, 2004.

Georgia State University

Department of Mathematics and Statistics

Organizer Image Analysis Seminar, 2001 - 2003. Committee Member, Graduate Committee, 1999-2003.

Committee Member, Statistics Committee, 1998 - 2003

The Profession

Reviewer for Refereed Journals

(since 2021-one) *Geo-Spatial Information Science*

(since 2020-one) *Bernoulli*

(since 2019-one) *Scandinavian Journal of Statistics*

(since 2019-one) *Physica Scripta*

(since 2018-one) *Annals of Applied Statistics*

(since 2018-one) *Journal of Imaging*

(since 2017-one) *Journal of Machine Learning Research*

(since 2015-one) *Proceedings of the American Mathematical Society*

(since 2015-one) *TGAC - Geodesy and Cartography*

(since 2013-one) *Biometrical Journal*

(since 2013-one) *ISRN Probability and Statistics.*

(since 2012-two) *IEEE Journal of Selected Topics in Signal Processing*

(since 2012-two) *Annals of the Institute of Statistical Mathematics*

(since 2012-one) *Computational Statistics and Data Analysis*

(since 2012-one) *Journal of the Korean Statistical Society*

(since 2011-one) *IEEE Transactions on Information Theory*

(since 2009-one) *Journal of Computational and Graphical Statistics*

(since 2009-multiple) *Electronic Journal of Statistics*

(since 2009-one) *IEEE Transactions on Pattern Analysis and Machine Intelligence*

(since 2008-multiple)*Journal of Royal Statistical Society*

(since 2008-two) *Sankhya*

(since 2007-one) *Statistica Sinica*

(since 2006-one) *Test*

(since 2006-multiple) *Journal of The American Statistical Association*

(since 2006-three) *Biometrika*

(since 2005-multiple) *Annals of Statistics*

(since 2005-one) *IEEE Transactions on Signal Processing*

(since 2004-two) *Journal of Statistical Planning and Inference*

(since 2004-two) *Journal of Mathematical Imaging and Vision*

(since 2004-one) *Classical Quantum Gravity*

(since 2004-two) *IEEE Transactions on Pattern Analysis and Machine Intelligence*

(since 2004-one) *Statistics and Probability Letters*

(since 2003-multiple) *Journal of Multivariate Analysis*

(since 2003-one) *Stochastic Environmental Research and Risk Assessment Journal*

(since 2003-one) *Reviews in Mathematical Physics*

(since 2002-one) *Algebra Geometry and Applications Seminar Proceedings*

(since 1996-one) *Transactions of the American Mathematical Society*

(since 1984-one) *Studii si Cercetari Matematice* (in Romanian)

(since 1983-one) *Gazeta Matematica A* (in Romanian)

Editorial Board Memberships

Journal of Statistical Theory and Practice. (since 2022)

BSG Proceedings. (since 2013)

ISRN Probability and Statistics. (2012-2014)

Applied Sciences, electronic journal. (since 2000)

Differential Geometry - Dynamical Systems, electronic journal. (since 2003)

Reviewer for Grant Applications

(2021) European Research Council

(2012-panel,2015-ad-hoc) National Science Foundation

(2007, 2009, 2010, 2011, 2013, 2016, 2021) National Science Engineering Research Council of Canada

(2005) Israel Science Foundation

Other Reviewer Activities

Reviewer for *Mathematical Reviews*, the main publication worldwide that posts reviews of published papers in Mathematical Sciences (including Statistics), since 1995. In that capacity he reviewed 1 monographs and 29 papers.

Creator of 62R30- Statistics on Manifolds, as part of MSC2020, for Mathematical Reviews and Zentralblatt für Mathemathik

Recent Service to Professional Associations

1. Organizer of Invited Session on *Object Data Analysis* at the AISC 2022 Conference, Greensboro, US, October 2022.

2. Organizer and Chair of the invited session on *Stratified Spaces with Applications to DNA and SARS Cov 2 RNA* at the International Symposium of Nonparametric Statistics, Paphos, Cyprus, June 20 - 24, 2022.

3. Member of the Scientific and Organizing Committee of the 15^{th} *International Conference "Differential Geometry and Dynamical Systems (DGDS-2021)",* online, August 26–29, 2021.

4. Member of the Scientific and Organizing Committee of the 14^{th} *International Conference "Differential Geometry and Dynamical Systems (DGDS-2020)",* online, August 27–29, 2020.

5. Member of the Scientific and Organizing Committee of the 13^{th} *International Conference "Differential Geometry and Dynamical Systems (DGDS 2019)",* Mangalia, Romania, October 10–13, 2019.

6. Organizer of the Special Session on *Geometric Structures and Statistics on Manifolds with Applications* at the 9th CMR, June 28 - July 3, 2019, Galati, Romania.

7. Chair of an Invited Session at *8th International Conference on Stereology, Spatial Statistics and Stochastic Geometry S4G'2018.* Prague, Czech Republic, June 25-29, 2018.

8. Organizer of the sessions on *Advances in Object Data Analysis* at the Fourth Conference of the International Society for Nonparametric Statistics, Salerno, Italy, June, 11-15, 2018.

9. Organizer of the session on *Object Data Analysis* at the Indian International Statistics Association, Gainesville, May, 17-20, 2018.

10. Organizer of the session on *Object Data Analysis* and Chair of another session at the Third Conference of the International Society for Nonparametric Statistics, Avignon, France, June, 12-16, 2016.

11. Organizer of the session on *Data Analysis on Homogeneous Spaces* at the 8th CMR, June, 26-30, 2015, Iassy, Romania.

12. Organizer of the session on *Statistics in Medical Imaging: Geometry, Inference and Computations*, COMPSTAT 2014, Geneva, Switzerland, August 19-22, 2014

13. Organizer and manager of Working Group *Data Analysis on Hilbert Manifolds and their Applications* at SAMSI - LDHD Program 2013-2014.

14. Organizer of the session on *Data Analysis on Stratified Spaces* at the Second Conference of the International Society for Nonparametric Statistics, Cadiz, Spain, June, 12-16, 2014.

15. Member of the Scientific and Organizing Committee of the *International Conference "Differential Geometry and Dynamical Systems - 2013",* Bucharest, Romania, October 10-13, 2013.

16. Organizer and Chair of the session on *Analysis of 3D Scenes from Digital Camera Images* at the 29^{th} European Meeting of Statisticians, Budapest, Hungary, July 20-25, 2013.

17. Organizer and Chair of the session on *Nonparametric Statistics on Manifolds* at the First Conference of the International Society for Nonparametric Statistics, Chalkidiki, Greece, June 15-19, 2012.

18. Member of the Organizing Committee of the Workshop on Probability, Combinatorics and Geometry in Biology, Mathematics and Biology Institute, Columbus, OH, May 25-29, 2012.

19. Member of the International Scientific Committee of the Workshop on Nonparametrics and Geometry, Charles University, Prague, Czech Republic, August 15-19, 2011, and Session Chair, August 18, 2011.

20. Leader (with Ezra Miller (Duke University)) of Working Group *Data Analysis on Spaces that*

Admit a Manifold Stratification at SAMSI - AOD Program 2010-2011.

21. Chair of Session 1, The Florida Chapter of the American Statistical Association Annual Meeting, Tallahassee, Florida (2/19/2010 -2/20/2010).

External Peer Reviewer for Promotion and Tenure

(2019) External reviewer for tenure of Associate Professor of faculty member at Florida Agricultural and Mechanical University.

(2018) External reviewer for promotion to Associate Professor of faculty member at Florida Agricultural and Mechanical University.

(2016) External reviewer for promotion to Full Professor of faculty member at University of Alberta, Canada.

(2016) External reviewer for tenure and promotion to Associate Professor of faculty member at Texas Tech University.

(2015) External reviewer for tenure and promotion to Associate Professor of faculty member at Rutgers University.

(2015) External reviewer for promotion to Professor of tenured faculty member at University of South Carolina Upstate.

(2013) External reviewer for promotion to Professor of tenured faculty member at Missouri University of Science and Technology.

(2006) External reviewer for tenure and promotion to Associate Professor of faculty member at Texas Tech University.

(2005) External reviewer for promotion to Professor of tenured faculty member at Louisiana State University.

Professional Memberships

American Statistical Association (Lifetime member)

Institute of Mathematical Statistics (1997 - present)

Bernoulli Society for Mathematical Statistics and Probability (2013)

American Mathematical Society (1992 - 2006)

Balkan Society of Geometers (1999 - present)