YOUNGSER PARK

(version: April 21, 2016)

Home Address
8810 Joshua Court
Pikesville, MD 21208
(home) 410-580-2090
(cell) 443-629-8818
(email) youngser@gmail.com

Work Address
The Johns Hopkins University
Center for Imaging Science
Clark 301 / 3400 N. Charles St.
Baltimore, MD 21218-2686
(office) 410-516-2862, (fax) -4594

Education

The George Washington University
Ph.D. in Computer Science. March 2011. Title: *Anomaly Detection in Time Series of Graphs and Hypergraphs using Graph Features.*

The George Washington University
M.S. (with distinction) in Computer Science. February 1993.

Inha University, Seoul, Korea
B.E. (with honor) in Electrical Engineering. February 1985.

Experience

The Johns Hopkins University — Center for Imaging Science
July 2011 – Present
Associate Research Scientist, conducting research on statistical inference problems supported by NSF, DARPA, Howard Huges Medical Institutes, etc. Also advising graduate students and postdocs on their research works.

The Johns Hopkins University — Center for Imaging Science
May 2004 – June 2011
Senior Research Analyst, developing and testing a new automated shape analysis algorithm to identify brain images in a study of Alzheimer's Disease funded by NIH. Also continuing to work on iterative denoising project funded by DARPA.

The Johns Hopkins University — Center for Imaging Science
May 2003 – May 2004
Postdoc Fellow, developing and testing a new clustering algorithm to identify meaningful cross-corpus associations using an iterative denoising algorithm for DARPA funded project.

The GWU — Computer Science
September 1999 – May 2003
Graduate Research Assistant, developed and tested a new classification algorithm to discover significant clusters in high-dimensional noisy data funded by Robert Bosch in Germany.

The GWU — Computer Science
July 2001 – August 2001
Lecturer, taught Introduction to Programming in C++ course.

THE JHU — Biomechanics Lab
August 1998 – July 1999

Senior Research Engineer, developed soft tissue deformation tools for the shoulder kinematics and dynamics using OpenGL.

THE GWU — Computer Science
January 1993 – August 1998

Graduate Research Fellow, worked at the Laboratory for Advanced Computer Applications in Medicine (LACAM) for creating VR tools for surgical simulations using OpenInventor and VRML2.0.

Publications submitted to Journal

V. Lyzinski, M. Tang, A. Athreya, **Y. Park**, C. E. Priebe, "Community Detection and Classification in Hierarchical Stochastic Blockmodels," submitted, 2015.

V. Lyzinski, **Y. Park**, C. E. Priebe, M. W. Trosset, "Fast Embedding for JOFC Using the Raw Stress Criterion," submitted, 2015.

N. H. Lee, I. J. Wang, **Y. Park**, C. E. Priebe, M. Rosen, "Techniques for clustering interaction data as a collection of graphs," submitted 2014.

M. Tang, **Y. Park**, and C. E. Priebe, "Out-of-sample Extension for Latent Position Graphs," submitted 2013.

V. Lyzinski, S. Adali, J. T. Vogelstein, **Y. Park**, C. E. Priebe, "Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability," submitted 2013.

Publications Journal

M. Tang, A. Athreya, D.L. Sussman, V. Lyzinski, **Y. Park**, C.E. Priebe, "A semiparametric two-sample hypothesis testing problem for random dot product graphs," Journal of Computational and Graphical Statistics, accepted for publication, 2016.

D. E. Fishkind, C. Shen, **Y. Park**, C.E. Priebe, "On the Incommensurability Phenomenon," Journal of Classification, accepted for publication, 2015.

V. Lyzinski, D. L. Sussman, D. E. Fishkind, H. Pao, L. Chen, J. T. Vogelstein, **Y. Park**, C. E. Priebe, "Spectral Clustering for Divide-and-Conquer Graph Matching," Parallel Computing, in press, 2015. doi:10.1016/j.parco.2015.03.004

J. Vogelstein*, **Y. Park***, T. Ohyama*, R. Kerr, J.W. Truman, C.E. Priebe, M. Zlatic, "Discovery of Brainwide Neural-Behavioral Maps via Multiscale Unsupervised Structure Learning," Science, Vol. 344 No. 6182, 386-392, April 25, 2014. (* co-first)

H. Wang, M. Tang, **Y. Park**, and C.E. Priebe, "Locality statistics for anomaly detection in time series of graphs," IEEE Transactions on Signal Processing, Vol. 62, No. 3, pp. 703-717, February, 2014.

Y. Park, C.E. Priebe, and A. Youssef, "Anomaly Detection in Time-Series of Graphs using Fusion of Invariant," IEEE Journal of Selected Topics in Signal Processing, Vol. 7, No. 1, pp. 67-75, February, 2013.

M. Tang, **Y. Park**, N.H. Lee, and C.E. Priebe, "Attribute Fusion in a Latent Process Model for Time Series of Graphs," IEEE Transactions on Signal Processing, Vol. 61, No. 7, pp. 1721-1732, April, 2013.

N. Ram Mohan, C.E. Priebe, **Y. Park**, and M. John, "Statistical Analysis of Hippocampus Shape Using a Modified Mann-Whitney-Wilcoxon Test," International Journal of Bio-Science and Bio-Technology, Vol. 3, No. 1, pp. 19-26, 2011.

Z. Ma, A. Cardinal-Stakenas, **Y. Park**, M.W. Trosset, and C.E. Priebe, "Dimensionality Reduction on the Cartesian Product of Embeddings of Multiple Dissimilarity Matrices," Journal for Classification, vol 27, pp 1-15, October, 2010.

C.E. Priebe, **Y. Park**, D.J. Marchette, J.M. Conroy, J. Grothendieck, and A.L. Gorin, "Statistical Inference on Attributed Random Graphs: Fusion of Graph Features and Content: An Experiment on Time Series of Enron Graphs," Computational Statistics and Data Analysis, volume 54, pages 17661776, 2010.

M.I. Miller, C.E. Priebe, Qiu, A., Fischl, B., Kolasny, A., Brown, T., **Y. Park**, Ratnanather, J.T., Busa, E., Jovicich. J., Yu, P., Dickerson, B.C., Buckner, R.L. and the Morphometry BIRN, "Collaborative computational anatomy: An MRI morphometry study of the human brain via diffeomorphic metric mapping", Human Brain Mapping, 30:2132-2141, Wiley-Liss,
also available at `http://dx.doi.org/10.1002/hbm.20655` (online), 2009.

Y. Park, C.E. Priebe, M.I. Miller, N. Ram Mohan and K.N. Botteron, "Statistical Analysis of Twin Populations using Dissimilarity Measurements in Hippocampus Shape Space", *Journal of Biomedicine and Biotechnology*, vol 2008, 2008.

M.W. Trosset, C.E. Priebe, **Y. Park**, and M.I. Miller, "Semisupervised Learning from Dissimilarity Data", *Computational Statistics and Data Analaysis*, 52, 4643–5657, 2008. Also presented at the Joint Statistical Meetings 2007, Salt Lake City, Utah.

C.E. Priebe, D.J. Marchette, **Y. Park**, and R.R. Muise, "An Application of Integrated Sensing and Processing Decision Trees for Target Detection and Localization on Digital Mirror Array Imagery", In *Journal of Applied Optics*, 45, 13 (2006): 3022–3030.

C.E. Priebe, J.M. Conroy, D.J. Marchette, and **Y. Park**, "Scan Statistics on Enron Graphs", In *Journal of Computational and Mathematical Organization Theory*, 11, 229–247, Springer Science, 2005.

J. Hahn, R. Kaufman, A.B. Winick, T. Carleton, **Y. Park**, R. Lindeman, K.M. Oh, N. al-Ghreimil, R.J. Walsh, M. Loew, J. Gerber, S. Sankar, "Training Environment for Inferior Vena Caval Filter Placement", In *The Medicine Meets Virtual Reality*, (January 1998).

Publications
Conference

Y. Park, H. Wang, T. Nöbauer, A. Vaziri, C. E. Priebe, "Anomaly Detection on Whole-Brain Functional Imaging of Neuronal Activity using Graph Scan Statistics" ACM Conference on Knowledge Discovery and Data Mining (KDD), Workshop on Outlier Definition, Detection, and Description (ODDx3), August 10, 2015.

H. Wang, M. Tang, C.E. Priebe, **Y. Park**, "Inference in Time Series of Graphs using Locality Statistics" , IEEE Global Conference on Signal and Information Processing, Austin, Texas, Dec 3-5, 2013.

C.E. Priebe, N.H. Lee, **Y. Park**, M. Tang, "Attribute Fusion in a Latent Process Model for Time Series of Graphs," IEEE International Workshop on Statistical Signal Processing 2011 (SSP'11), Nice, France, June 28-30, 2011.

Y. Park, C.E. Priebe, A. Youssef, "Anomaly Detection using Fusion of Graph Invariants on a Time Series of Graphs," Joint Statistical Meetings 2010, Vancouver, August, 2010.

N. Ram Mohan, C.E. Priebe, **Y. Park**, and M. John, "Statistical Analysis of Hippocampus Shape Using a Modified Mann-Whitney-Wilcoxon Test", BSBT 2009, Jeju, Korea, Dec. 2009,

Z. Ma, A. Cardinal-Stakenas, **Y. Park**, C.E. Priebe, "Combining Dissimilarity Representations in Embedding Product Space," JSM 2009, Washington, DC, August, 2009.

Y. Park, C.E. Priebe, D.J. Marchette, A. Youssef, "Anomaly Detection using Scan Statistics on Time Series Hypergraphs", JSM 2009, Washington, DC, August, 2009.

B.A. Landman, **Y. Park**, Z. Ma, C.E. Priebe, "Data Fusion and Inference with Disparate Feature Spaces using Iterative Denoising Trees" JSM 2009, Washington, DC, August, 2009.

N. Ram Mohan, C.E. Priebe, **Y. Park**, M.John, "Hippocampus shape analysis of clinically depressed twin populations using a modified Mann-Whitney-Wilcoxon statistic" JSM 2009, Washington, DC, August, 2009.

Y. Park, C.E. Priebe, D.J. Marchette, A. Youssef, "Anomaly Detection using Scan Statistics on Time Series of Hypergraphs,", Workshop on Link Analysis, Counterterrorism and Security at the SIAM International Conference on Data Mining, Sparks, Nevada, May 1-3, 2009

Z. Ma, A. Cardinal-Stakenas, **Y. Park**, C.E. Priebe, "Combining Dissimilarity Representations in Embedding Product Space", *Interface 2008*, Durham, NC, 2008.

A. Cardinal-Stakenas, Z. Ma, **Y. Park**, C.E. Priebe, "Comparing Dissimilarity Representations of Disparate Information", *Interface 2008*, Durham, NC, 2008.

Y. Park, C.E. Priebe, K. Botteron, M.I. Miller, N.R. Mohan, "Hippocampus shape-space analysis of clinically depressed, high risk, and control twin populations", *Frontiers in the Convergence of Bioscience and Information Technologies 2007*, Jeju, Korea, 2007.

"LDDMM Software Suite: an evolving BIRN technology", In *2006 TeraGrid Conference*, Indianapolis, IN, (June, 2006).

"BIRN and Computational Anatomy: A TeraGrid Technology", In *2006 TeraGrid Conference*, Indianapolis, IN, (June, 2006).

D.J. Marchette, C.E. Priebe, **Y. Park**, D. Karakos, "Iterative Denoising for Adaptive Sensors", In *Hawaii International Conference on Statistics, Mathematics and Related Fields*, (January 2006).

"Pattern Classification of Hippocampal Shape Analysis in a Study of Alzheimer's Disease", In *Human Brain Mapping 2005*, (June 2005).

C.E. Priebe, D.J. Marchette, J.Conroy, **Y. Park**, "Scan Statistics on Enron Graphs", In *SIAM International Conference on Data Mining (SDM'05), Workshop on Link Analysis, Counterterrorism and Security*, (April 2005).

D.J. Marchhe, C.E. Priebe, **Y. Park**, "Comparing Apples and Oranges: Method for Comparing the Incomparable", In *Hawaii International Conference on Statistics and Related Fields*, (August 2004).

C.E. Priebe, D.J. Marchette, **Y. Park**, E. Wegman, J. Solka, D. Socolinsky, D. Karakos, K. Church, R. Guglielmi, R. Coifman, D. Lin, D. Healy, M. Jacobs, A. Tsao, "Iterative Denoising for Cross-Corpus Discovery", In *COMPSTAT 2004*, (August 2004).

Y. Park, P. Bock, "Discovering Clusters In High-Dimensional Noisy Feature Spaces Using A Dynamic Agglomerative Decimation Clustering Algorithm", In *ANNIE2002*, (November 2002).

Y. Park, P. Bock, "Discovering Clusters in High-Dimensional Noisy Feature Spaces Using a Dynamic Agglomerative Decimation Clustering Algorithm", In *NGDM2002*, (October 2002).

Y. Park, R. Lindeman, J. Hahn, "X-Ray Casting: Fast Volume Visualization Using 2D Texture Mapping Techniques", In *IEEE Visualization'96 Late Breaking Hot Topics*, (October 1996).

Invited Talks

"Anomaly Detection in Time-Series of Graphs," BK21+ Seminar, Seoul National University, Seoul, Korea, July 21, 2015.

"Discovery of Brainwide Neural-Behavioral Maps via Multiscale Unsupervised Structure Learning," BK21+ Seminar, Seoul National University, Seoul, Korea, June 27, 2014.

"Anomaly Detection using Scan Statistics on Enron Graphs and Hypergraphs," IASC 2008 Statistical Modeling for Computer Security, Seoul, Korea, December, 2008.

"On the Exploitation of Multiple Disparate Dissimilarities," JSM 2008, Denver, CO, August, 2008.

"Scan Statistics in Hypergraphs," Interface 2008, Durham, NC, May, 2008.

"Disparate Information Fusion: On the Exploitation of Multiple Disparate Dissimilarities," Interface 2008, Durham, NC, May, 2008.

"Statistical Analysis of Twin Populations using Dissimilarity Measurements in Hippocampus Shape Space," CS departmental seminar series, Virginia Commonwealth University, November, 2007.

Grants Participated

JHU Science of Learning Institute, "The ABC's of Fusion and Inference from Multiple Connectome Modalities," PI with Ming Tang, submitted, 2016.

JHU IDIES seed funding, "Algorithmic and theoretical advances for graphs comparisons with appplication to social networks and connectomics," Co-PI with Minh Tang, submitted, 2016.

National Science Foundation, "ABI Innovation: The ABCs of fusion and inference from multiple connectome modalities," PI: Carey E. Priebe, Co-PI with Minh Tang, 2015.

National Science Foundation, "NSF BRAIN EAGER: Discovery and characterization of neural circuitry from behavior, connectivity patterns and activity patterns," 09/01/14–08/31/16, PI: Carey E. Priebe

DARPA "Fusion and Inference from Multiple and Massive Disparate Distributed Dynamic Data Sets," 10/1/2012-3/31/2017, PI: Carey E. Priebe.

National Security Science and Engineering Faculty Fellowship Program, "Fusion and Inference from Multiple and Massive Disparate Data Sources," 02/09/09-02/08/14, PI: Carey E. Priebe.

Johns Hopkins University Human Language Technology Center of Excellence, "Streaming Content in Context," 2008–Current, PI: Carey E. Priebe.

Air Force Office of Scientific Research, "Information Fusion: Inference from Graphs and Feature Matrices," 06/01/09-11/30/11, PI: Carey E. Priebe.

Office of Naval Research, "Disparate Information Fusion: Embedding & Exploitation of Disparate Measurements," N00014-07-1-0328, 11/29/06-12/31/09, PI: Carey E. Priebe.

DARPA MTO, "A Compressed Sensing Approach to SIGINT Processing," N66001-06-1-2009, 02/02/06-12/31/08, PI: Carey E. Priebe.

DARPA/AlgoTek, "Visual Brain," 06/29/05-06/28/06, PI: Carey E. Priebe.

DARPA/AlgoTek, "BICA," 04/10/06–1/30/07, PI: Carey E. Priebe.

DARPA Applied and Computational Mathematics Program, (subcontract from Lockheed Martin) "ISP Phase II," 09/01/2004-09/30/2006, PI: Carey E. Priebe.

Raytheon, "Transitioning Automatic Target Recognition/Classification Algorithms to Signals and Image Domains," 8/15/2005-12/31/2005, PI: Carey E. Priebe.

DARPA, (subcontract from AlgoTeks Contract MDA972-03-C0014) "Novel Mathematical and Computational Approaches to Exploitation of Massive, Non-physical Data," 06/01/03-09/30/04, PI: Carey E. Priebe.

Awards

"Comparing Dissimilarity Representations", *R.L. Anderson Award, Clint Miller Award honorable mention for best poster*, Southern Regional Council on Statistics Summer Research Conference, Charleston, SC, July, 2008.

"On Combining Dissimilarity Representations", *R.L. Anderson Award, Clint Miller Award honorable mention for best poster*, Southern Regional Council on Statistics Summer Research Conference, Charleston, SC, July, 2008.

Mentorship

JHU AMS Ph.D. Students: Ting Chao, Percy Li, Runge Tang, Jordan Yoder, Heng Wang, Lee Chen, Sancar Adali, Zhiliang Ma

JHU CS Ph.D. Kendall Giles

JHU EE Ph.D. Student: Ming Sun

JHU AMS M.S. Student: Nikhil Ram Mohan

JHU AMS B.S. Student: Eugene Cho