Curriculum Vitae of **Md Ashad Alam,** PhD

Instructor of Statistics and Data Science
Division of Biomedical Informatics and Genomics
John W. Deming Department of Medicine, School of Medicine, Tulane University
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RESEARCH INTEREST

As a statistical scientist, my research interests are in the areas of theoretical and computational aspects of Data Science, including statistical machine learning, deep learning, robust statistics, and adversarial machine learning. I work for the integrated analysis of multi-view data in biomedical applications. Projects which aim to reveal new fundamental biological insights of complex diseases, as well as those centered on more clinical applications appeal to me.

Statistical machine learning: dimensionality reduction, feature selection, non-parametric models, and inference methods for integrative analyses of multi-omics biomedical data including genome, epigenome, transcriptome, proteome, metabolome, lipidome, and medical image of complex diseases.

Deep learning: the advances in deep learning technologies provide new effective paradigms to obtain end-to-end learning models from complex, high-dimensional and heterogeneous biomedical data. Deep learning approaches could be vehicle for translating big biomedical data into improved human health.

Robust and adversarial machine learning: non-parametric inference, robustness of linear multivariate approaches, robustness of kernel methods, and incorporate as well as invent adversarial machine learning techniques for given complex diseases prediction using a multi-view biomedical dataset.

ACADEMIC HISTORY

Tulane University, USA (Jan. 2019 – Nov. 2020)
Department of Biostatistics and Data Science
Post-Doctoral Researcher
Topic: Adversarial learning for multi-view data fusion to characterize complex diseases

Tulane University, USA (Nov. 2015 – Sept. 2017)
Department of Biomedical Engineering
Post-Doctoral Researcher
Topic: Extraction and integration of biomarkers from multi-modality kernel based genomic techniques

The Graduate University for Advanced Studies, Japan (Oct. 2009 - Sept. 2014)
PhD. in Statistical Science
Dissertation Topic: Kernel Choice of Unsupervised Kernel Methods

University of Rajshahi, Bangladesh (July 1998 - June 2004)
Department of Statistics
M.Sc. in Statistics, Topic: Robustness of Correlation Analysis
B.Sc. (Hons.) Major: Statistics, Mathematics and Computer Science

RESEARCH and TEACHING EXPERIENCE	Working Period	Working Position and Place
	November 20, 2020-Present	**Instructor of Statistics and Data Science** Graduate Programs Codirector (Pioneer) The Division of Biomedical Informatics and Genomics John W. Deming Department of Medicine Tulane University, New Orleans, LA 70112, **USA**
	January 18, 2019 – November 19, 2020	**Postdoctoral Research Fellow** Department of Biostatistics and Data Science Tulane University, New Orleans, LA 70112, **USA**
	March 03, 2018 – March 19, 2018	**Visiting Research Fellow** Department of Electrical and Electronics Engineering, University of Fukui, Fukui-Shi, Fukui 910-8507, **Japan**
	January 15, 2018 – January 15, 2019	**Professor** Department of Statistics Hajee Mohammad Danesh Science & Technology University Dinajpur-5200, **Bangladesh**
	November 16, 2015 - September 08, 2017	**Postdoctoral Research Fellow** Department of Biomedical Engineering Tulane University, New Orleans, LA 70112, **USA**
	September 04, 2013-November 15, 2015	**Associate Professor** Department of Statistics Hajee Mohammad Danesh Science & Technology University Dinajpur-5200, **Bangladesh**
	October 01, 2014 - October 11, 2014	**Research Fellow** Center for Statistical Machine Learning The Institute of Statistical Mathematics Tokyo 190-0014, **Japan**
	October 1, 2009 - September 30, 2014	**Research Assistant** Fukumizu's Lab, The Institute of Statistical Mathematics Tokyo 190-0014, **Japan**
	January 16, 2008-September 30, 2009	**Assistant Professor** Department of Statistics Hajee Mohammad Danesh Science & Technology University Dinajpur-5200, **Bangladesh**
	September 04, 2005-January 15, 2008	**Lecturer** Department of Statistics Hajee Mohammad Danesh Science & Technology University Dinajpur-5200, **Bangladesh**

REVIEWING SERVICE

NeuroImage, Japanese Journal of Statistics and Data Science, IEEE Transaction of Image Processing, PLoS one, f1000, Journal of Medicine and Biological Studies, Asian Research Journal of Mathematics, International Journal of Statistical Science, CNS Spectrums, Multidiscipline Modeling in Materials and Structues, ICIET-2018, and ICPMS-2019

COMPUTER SKILLS

Operating System: Widows, Mac OS, and Linux (Personal compute as well as supercomputer)

Programming: Turbo C/C++, R (My own package, https://CRAN.R-project.org/package=RKUM, Robust kernel unsupervised methods), Python, and MATHLAB programming

Document Preparation System: Microsoft and LaTex

Database Management and Cloud Computing: MySQL**,** MapReduce, Hadoop, and Apache Spark

TEACHING SKILLS

Undergraduate Studies (HSTU, Bangladesh): Probability Theory (STT153), Statistical Inference-I & II (STT261 & STT351), Biostatistics (STT369), Computing in Statistics (STT257), Multivariate Analysis-I & II (STT451 & STT461), Robust and Nonparametric Statistics (STT457), and Bayesian Methods and Decision Theory (STT499).

Graduate Studies (Tulane University, U.S.A.): Fundamental of Data Analytics (BIMI-6300), Introduction to Data Science for Biomedical Informatics (BIMI-6200), Statistical Machine and Deep Learning in Biomedical Practice (BIMI-7100), and Biomedical Data Science with Cloud Computing (BIMI-7300).

CURRICULUM DEVELOPMENT SKILLS

Ph.D. Program (Pioneer): Ph.D. track in Biomedical Informatics within PhD in Biomedical Sciences, Division of Biomedical Informatics and Genomics, John W. Deming Department of Medicine, School of Medicine, Tulane University, U.S.A

Master's Program (Pioneer): Master of Science in Biomedical Informatics**,** Division of Biomedical Informatics and Genomics, John W Deming Department of Medicine, School of Medicine, Tulane University, U.S.A

Undergraduate Program (Pioneer): B.Sc. (Hons.) in Statistics**,** Department of Statistics, Hajee Mohammad Danesh Science & Technology University, Dinajpur-5200, Bangladesh

NIH GRANTS PROCESSING SKILLS

I have effective grant proposal writing skills (RO1, NIH Grants Process) with my current supervisor, Professor Hong-Wen Deng. This grant project is essential for furthering understanding of the biological systems underlying serious human health conditions and will broadly impact the field by using multi-view biomedical data.

HONORS AND AWARDS

1. NSF Travel Fund Award for 2016, the 7th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics, Seattle, WA. **USA**
2. Outstanding presentation award, Action Recognition for Robots Using Kernel Methods, "The 1st UST-Sokendai Joint Seminar on Computer Science- 2014" held at UST, Daejeon, **South Korea**
3. GUAS and ISM FY 2013 travel support for an international paper/ poster presentation by young researchers, The Institute of Statistical Mathematics, Tokyo, **Japan**
4. ISM FY 2011 travel support for an international paper/ poster presentation by young researchers, The Institute of Statistical Mathematics (ISM), Tokyo, **Japan**
5. The Japan Govt. Monbukagakusho (MEXT) scholarship award for PhD. degree, Oct. 2009- Sep. 2014, **Japan**
6. Merit-based student award, University of Rajshahi, 2001, **Bangladesh**
7. Merit-based hall gold medal, Shah Makhdum Hall, University of Rajshahi, 2001, **Bangladesh**.

PUBLICATION

Theses:

1. **Alam, M. A.** *Kernel Choice for Unsupervised Kernel Methods*, a dissertation of PhD. (Statistical Science), Department of Statistical Science, The Institute of Statistical Mathematics, The Graduate University of Advanced Studies, Japan, 2014

2. **Alam, M. A.** *Comparison among Robust and Non-robust Estimators of Correlation Coefficient: A Bootstrap and Influence Function Based Approach*, a dissertation of M.Sc. (Statistics), Department of Statistics, University of Rajshahi, Bangladesh, 2003

Preprint:

1. **Alam, M. A.,** Qiu, C., Shen, H., Wang Y-P., and Deng, H-W. A generalized kernel machine approach to identify composite effect in multi-view dataset, with application to osteoporosis (Under 2nd review by Journal of Biomedical Informatics)

2. **Alam, M. A.,** and Deng, H-W. Robust Adversarial multiple kernel canonical

correlation analysis, with application to Osteoporosis (Under experiment)

Journal articles:

1. Auliah, F. N., Nilamyani, A. N., Shoombuatong, W., Alam**, M. A.,** H., Hasan, M. M., and Kurata, PUP-Fuse: prediction of protein pupylation sites by integrating multiple sequence representations, ***International Journal of Molecular Sciences***, 22, 2120, https://doi.org/10.3390/ijms22042120, 2021

2. Khatun M. S, Shoombuatong, W., Alam**, M. A.,** Mollah M. N. H., and Kurata, H., Hasan, M. M., Recent development of bioinformatics tools for micro-RNA target prediction, ***Current Medicinal Chemistry***, 2021 (accepted).

3. Hasan M.M., **Alam, M. A.,** Shoombuatong W., and Kurata H., IRC-Fuse: improved and robust prediction of redox-sensitive cysteine by fusing of multiple feature representation, ***Journal of Computer-Aided Molecular Design***, Vol. 35, pp. 1-9, https://doi.org/10.1007/s10822-020-00368-0, 2021.

4. Mamun M. Kim J-J**, Alam, M. A.,** and An K-G., Prediction of Algal Chlorophyll-a and Water Clarity in Monsoon-Region Reservoir using Machine Learning Approaches, ***Water***, Vol. 2020, No. 12(1), 30; doi:10.3390/w12010030, 2020

5. **Alam, M. A.,** Shajaman, M., Rahman F. M., Hossan, F., Deng, H-W., Gene Shaving Using A Sensitivity of Kernel based Machine Learning Approach, with Application to Cancer Data, ***PLoS ONE***, Vol. 14(5): e0217027, 2019.

6. **Alam, M. A.,** Komori, O., Deng, H-W., Calhoun, D. V., and Wang, Y- P., Robust Kernel Canonical Correlation Analysis to Detect Gene-Gene Co-association: A Genetics Study, ***Journal of Bioinformatics and Computational Biology***, Vol. 17, No. 4, 1950028 [23 pages], 2019

7. **Alam, M. A.,** Fukumizu, K., and Wang, Y- P., Influence Function and Robust Variant of Kernel Canonical Correlation Analysis, ***Neurocomputing***, Vol. 304, pp. 12-29. 2018

8. **Alam, M. A.,** Calhoun, D. V., and Wang, Y- P., Identifying Outliers Using Multiple Kernel Canonical Correlation Analysis with Application to Imaging Genetics, **Computational *Statistics and Data Analysis***, Vol. 125, pp. 70—85, 2018

9. **Alam, M. A.,** Calhoun, D. V., Lin, H-Y., Deng, H-W. and Wang, Y-P., A Kernel Machine Method for Detecting Higher Order Interactions in Multimodal Datasets: Application to Schizophrenia, ***Journal of Neuroscience Methods***, Vol. 309, pp. 161-174, 2018

10. **Alam, M. A.** and Fukumizu, K., Higher-order Regularized Kernel Canonical Correlation Analysis, ***International Journal of pattern recognition and artificial intelligence***, Vol. 29, Issued 04, 1551005[24 pages], June 2015.

11. **Alam, M. A.** And Fukumizu, K., Hyperparameter Selection in Kernel Principal Component Analysis, ***Journal of Computer Science***, Vol. 10, No. 7, pp. 1139 - 1150, 2014

12. Siraj-Ud-Doulah, M. and **Alam, M. A.** Performance Evaluation of Machine Learning Algorithms in Ecological Dataset, *International Journal of Applied* Mathematics and Machine Learning, 10 (1): pp. 15-45, 2019

13. **Alam, M. A**. Nasser, M. and Fukumizu, K., A Comparative Study of Kernel and Robust Canonical Correlation Analysis, *Journal of Multimedia*, Vol. 5, No. 1, pp. 3 – 11, May 2010

14. Shamsuzzoha, M. Hassanujjaman, M. Islam, M. A. Chowdhury B, A.K. M.M. **Alam, M. A.** and Islam, M.S. Antimicrobial Studies of Mixed Ligand Transition Complexes of CU(II) and Cd (II) with Maleic Acid and Heterocyclic Bases, *Universal Journal of Applied Science* Vol. 3 (3): 31-34, 2015

15. Hossain S.M.M., Hasan M.M, **Alam, M. A**., Islam M. M. Study on Epidenmiology and Chemical Control of Rhizome Rot Disease of Ginger (Zingiber officinale Rose), *Journal of Science and Technology*, Vol. 13, pp. 75-81, 2015

16. Nasser, M. Hamzah, N. A. and **Alam, M. A.**, Qualitative Robustness in Estimation, *Pakistan Journal of Statistics and Operation Research***,** vol. 8, No. 3, pp. 619-634, December 2012

17. Islam, M. N. **Alam, M.A.** Amin, M.R. and Roy D. C., Effect of Sun Drying on the Compositon and Shelf Life of Goat Meat (Capra aegagrus hircus), *Bangladesh Research Publications Journal*, Vol. 4(2) pp. 114-123, 2010

18. **Alam, M. A.** Nasser, M. and Imon, A H. M. R., Sensitivity and Influence Analysis of Estimators of Correlation Coefficients, *Journal of Applied Probability and Statistics*, Vol. 3, No. 1, pp. 119 - 136, May 2008

19. **Alam, M. A.,** and Nasser, M., Simulation Based Comparison among Fifteen Estimators of Correlation Coefficient, *International Journal of Statistical Science*, Vol. 8. pp. 63-74, November 2008

20. Hossain M. T., Hasan M. M., **Alam, M. A.,** Khatun A., and Alam M., Efficacy of Hot Water Treatment Device and some fungicides Against *Phomopsis vexans* of Eggplant, *International Journal of BioRes*, Vol 4, No, 6, pp. 54-58, 2008

21. Hosani, S. M. M., Hasan, M.M., Hasan, M. S., **Alam, M. A.,** Isalm, M. T., Screening of Tomato and Brinjal Against Bacterial Wilt Caused by Ralstonia solanacearum, *International Journal of Sustain Agriculture Technology, Vol.* 3, No. 1, pp. 13-15, 2007

22. **Alam, M. A.,** Effects of different estimators of correlation coefficient, Journal of

Business statistics, Southest University, Bangladesh, Vol. II, No. 2, pp. 181-196, 2006

International conference papers:

1. Lepow L. Wagner L. **Alam M. A.**, Ivanov I. Parva M.A., Prenatal Drug Exposure Potentiates the Effect of Childhood Trauma on Emotion Reactivity in an ABCD Sample, Society of Biological Psychiatry, SOBP2021, April 29-May 1. 2021.

2. **Alam M.A.,** Cheikhi A. Koc S. Waugh B., Tian, C. and Torian U., Applying machine learning techniques to omics and imaging data to model complex traits, Biological Data Science Codeathon, CSHL-2020, National Institutes of Health, Bethesda**,** MD, USA, Nov. 7-8, 2020.

3. **Alam M.A.,** and Wang, Y-P., Generalized Kernel Method for Higher Order Interaction: An Imaging Genetics Analysis (Poster), 28th Annual Health Sciences Research Days 2017, Tulane University, New Orleans, LA, USA, April 23- 24, 2017.

4. **Alam, M. A.,** Komori, O., Calhoun, D. V., and Wang, Y-P., Robust Kernel Canonical Correlation Analysis to Detect Gene-Gene Interaction for Imaging Genetics Data, BCB'16 Proceeding of the 7th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics, pp. 279-288, Seattle, WA. USA, Oct 02-05, 2016

5. **Alam, M. A.,** Calhoun, D. V. and Wang, Y-P., Influence Function of Multiple Kernel Canonical Correlation Analysis to Identify Outliers in Imaging Genetics Data, BCB'16 Proceeding of the 7th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics, pp. 210-219, Seattle, WA. USA, Oct 02-05, 2016

6. Richfield, O., **Alam M. A.,** Calhoun, V.D., and Wang Y-P., Learning Schizophrenia Imaging Genetics Data Via Multiple Kernel Canonical Correlation Analysis, BIBM 2016, Proceeding of the IEEE International Conference on Bioinformatics and Biomedicine, Shenzhen, China, Dec 15- 18, 2016, pp. 507-511

7. **Alam, M. A.** and Fukumizu, K., Action Recognition for Robots Using Kernel Methods, UST-*SOKENDAI Joint Seminar on Computational Sciences*, Daejeon, South Korea, July 2014 (Poster)

8. **Alam, M. A.** and Fukumizu, K., Influence function of kernel canonical correlation analysis, *Annual open house program*, the Institute of Statistical Mathematics, Japan, June 2014 ((Poster)

9. **Alam, M. A.** and Fukumizu, K., Higher-order Regularized Kernel CCA, Proceeding *ICMLA '13 Proceedings of the 2013, 12th International Conference on Machine Learning and Applications*, Vol. 1, pp. 374 - 377, USA, December 2013

10. **Alam, M. A.** and Fukumizu, K., Kernel and Feature Search in Kernel PCA, *The 3rd Assian Conference on Machine Learning*, Taoyuan, Taiwan, 2011 (Poster)

11. **Alam, M. A.** and Fukumizu, K., Kernel and Feature Search in Kernel PCA, *IEICE*

Technical Report, Vol. 111, No. 275, pp. 47-56, Japan, November 2011 (Poster)

12. **Alam, M. A.** Nasser, M. and Fukumizu, K., Sensitivity Analysis in Robust and Kernel Canonical Correlation Analysis, *Proceedings of **11**th International Conference on Computer and Information Technology* (ICCIT2008), pp. 399 - 404, Bangladesh, December 2008

13. Alamgir Kabir, A.Y.M. Nasser, M. and **Alam, M. A.**, A Study on Two New Robust Estimators of Canonical Correlation Coefficient, *Proceedings of International Conference on recent development in Statistical Science*, 2008, Bangladesh, pp. 241-247

INVITED TALKS

1. Data Science for Big Data Analytics (Keynote speaker), Webinar, Department of Information and Communication Technology, Mawlana Bhashani Science and Technology University, Tangail, **Bangladesh**, January 31, 2021.
2. Robust Statistical Machine Learning Approaches for Multi-Omics and Imaging Data Integration: Application to Schizophrenia, Colon Cancer, and Osteoporosis, Special Seminar, Department of Population Health Science and Policy, Icahn School of Medicine at Mount Sinai, New York City, New York 10029, **USA**, January 07, 2021.
3. Robust kernel machine learning approaches, with application to bioinformatics and imaging genetics, an invited talk, Department of Computer Science, University of New Orleans, New Orleans, LA 70148, **USA**, June 28, 2019
4. A Kernel machine method for detecting interactions in multi-view dataset, A day-long seminar, Department of Electrical and Electronics Engineering, University of Fukui, Fukui-Shi, **Japan**, March 19, 2017
5. A series of lectures on kernel methods for Bioinforamtics, held on November 19-21, 2017, Department of Statistics, University of Rajshahi, **Bangladesh**
6. Generalized Kernel Method for Higher Order Interaction: An Imaging Genetics Analysis, Center Seminar, held on February 14, 2017, Department of Global Biostatistics and Data Science, Tulane University, New Orleans, LA, **USA**
7. Robust Kernel Canonical Correlation Analysis to Genomic data, Center Seminar, held on 21th August 2016, Department of Global Biostatistics and Data Science, Tulane University, New Orleans, LA, **USA**
8. Unsupervised Kernel Methods: Limitations and Variants, a one-day pre-conference workshop held on 26th December 2014 to mark the 50th anniversary of the founding the Institute of Statistical Research and Training (ISRT), University of Dhaka, **Bangladesh**,

December 2014

9. Basic notion of unsupervised kernel method and its application, Workshop on Multivariate Exploration of Data, ICDDR, B, **Bangladesh** , May 2009
10. Robustness of correlation analysis, Workshop on Multivariate Exploration of Data, ICDDR, **Bangladesh**, May 2009
11. Comparison among Robust and Non-Robust Estimators of Correlation Coefficient based on Bootstrap and Influence Function, an invited talk the Institute of Statistical Mathematics, Tokyo**, Japan**, February 2009