

Hamdy F. F. Mahmoud

Associate Professor, Department of Statistics, Mathematics and Insurance, Assiut University in Egypt

- Contact Information** Hutcheson Hall Room 211, Department of Statistics, Virginia Tech, Blacksburg, VA.
ehamdy@vt.edu
- Research Interests** Semi/nonparametric regression models, spatial and spatio-temporal analysis, linear mixed models, and change point(s) detection.
- Education** **Virginia Polytechnic Institute and State University**, Blacksburg, VA, USA.
- Ph.D., Statistics September, 2014
 - **Title:** *Some Advanced Semiparametric Single-Index Modelling for Spatially-Temporally Correlated Data*
 - **Summary:** *My dissertation consists of three semiparametric modeling projects. In the first project, the single index change point model is proposed to model the unknown relationship between daily/weekly mortality and temperature and simultaneously detect the change point(s) in temperature adjusting for some other covariates. A sequential permutation based procedure test to detect multi-change points in temperature has been proposed. The asymptotic properties of the permutation testing based procedure have been shown. In the second project, two semiparametric spatial single index models are introduced to incorporate the spatially correlated data. In the last project, two semiparametric spatio-temporal single index models are proposed for spatio-temporal correlated data.*
 - **Advisor:** *Inyoung Kim, professor in Statistics at VT*
 - M.S., Statistics Fall 2010

Cairo University, Faculty of Economic and Political Sciences Cairo, Egypt,
 - M.S., Statistics Fall 2005

Title: *Bayesian Estimation of Variance Components in Nested Mixed Models*
Advisors: Tarek Emira and Alyaa Zahran, professors in Statistics, Cairo University.
 - B.Sc., Statistics Fall 1996
- Work Experience**
- **Collegiate Assistant Professor**, Department of Statistics, Virginia Tech December 2017 - present
 - **Assistant Professor**, Assiut University, Egypt 2015 - 2017
 - **Assistant Professor** (Part time), The Canadian University (ACU), Egypt, 2016/2017
 - **Technical Board Member**, Cairo Demographic Center (CDC), Egypt 2016/2017
 - **Visiting Assistant Professor**, Virginia Tech, USA 2014/2015
 - Teaching graduate courses, such as Advanced Contingency Table Analysis (STAT 5514G) and undergraduate courses, such as Introductory Statistics (STAT 2004) for more than 300 students from a variety of disciplines and Biological Statistics (STAT 3615) with 244 students.
 - Managed 12 TAs who graded and administered assignments
 - Doing research with Inyoung Kim, associate professor in Statistics department at Virginia Tech.

- **Instructor**, Virginia Tech, USA Spring 2013 - Spring 2014
- **Teaching Assistant**, Virginia Tech, USA Spring 2012 - Fall 2012
- **Assistant lecturer**, Assiut University, Egypt January, 2005 - August, 2009
- **Demonstrator**, Assiut University, Egypt January, 2000 - December, 2004

Teaching Experience

Virginia Polytechnic Institute and State University, Blacksburg, VA

- Courses taught as a Collegiate Assistant Professor:
 - STAT 3005**: Statistical Methods Fall 2023
 - STAT 4444/5444G**: Applied Bayesian Statistics Spring 2020-2023
 - STAT 4204/5204G**: Experimental Design: Concepts and Applications
Spring 2018-2023, Fall 2023
 - STAT 3615**: Biological Statistics Spring 2018,2019,2021 Fall 2018-2020,2022,
Summer I and II 2018-2023
 - STAT 2004**: Introductory Statistics Spring 2018-2020, 2022, Fall 2018,2019,2021
 - CMDA 2005**: Integrated Quantitative Science I Fall 2020 and Fall 2021
 - CMDA 2006**: Integrated Quantitative Science II Fall 2022
- Courses taught as a Visiting Assistant Professor and Instructor:
 - STAT 4514/5514G¹**: Contingency Table Analysis Spring 2015
 - STAT 2004¹**: Introductory Statistics Fall 2014 and Spring 2015
 - STAT 3615¹**: Biological Statistics Fall 2014 and Spring 2015
 - STAT 3005¹**: Statistical Methods I Spring 2013
 - STAT 3006¹**: Statistical Methods II Fall 2013

The Canadian University, School of Business Administration, Egypt

- o **BUSGB 300**: Quantitative Analysis for Business Fall 2016

Assiut University, Department of Statistics, Mathematics and Insurance, Assiut, Egypt - English program.

- Courses taught as an Assistant Professor

- * Applied Statistics Fall 2015 and 2016
- * Introduction to Operations Research Fall 2015
- * Principles of Statistics Spring 2016 and 2017
- * Computer languages and its applications Spring 2016 and 2017
- * Commercial Applications by Computer Fall 2015 and 2016
- * Actuarial Statistics 2016/2017

Cairo Demographic Center (CDC), Cairo, Egypt

- o Demographic Analysis Using Computer Software Packages (SPSS) Spring 2016

Course Development

STAT 3615 Biological Statistics

- Transformed the lectured based Biological Statistics course into synchronous hybrid course. Students watch the weekly prerecorded lectures at their convenience and during the class meetings, the concepts were reviewed and discussed, and then hands-on class exercises are held by dividing students into groups for practice.
- The assignments and tests were held online.

- This transformed course was taught in the Fall 2020 and Spring 2021.

STAT 4444/5444G Applied Bayesian Statistics

- Revamped class material for the undergraduate and graduate level Bayesian Statistics course content, including lectures, assignments and tests Spring 2020

CMDA 2005 Integrated Quantitative Science I

- Collaborated with another statistics faculty to revamp the course content, including lectures, assignments and tests Fall 2020

Publications Refereed Journal Articles

15. H.A. Ahmed, S.A.A. Khaled, E.M. Fahmy, N.A. Mohammed, **H.F.F. Mahmoud**. (2022). Significance of the mathematically calculated red cell indices in patients with qualitative and quantitative hemoglobinopathies. *Egypt J Intern Med*, 34, 60. <https://doi.org/10.1186/s43162-022-00147-3>
14. **H.F.F. Mahmoud**. (2022). Semiparametric Permutation-Based Change Point Detection with an Application on Chicago Cardiovascular Mortality Data. *Mathematics*, 10(6): 857. <https://doi.org/10.3390/math10060857>.
13. S.A.A.Khaled and **H.F.F. Mahmoud**. (2021). Platelet indices parameters in the new disease activity score of rheumatoid arthritis with ankle involvement: A comparative analytic study. *PLOS One*, 16(9): e0257200. doi.org/10.1371/journal.pone.0257200.
12. Farghally, M. F., & Mohammed, M. K. O., & **Mahmoud, H.F.F.**, & Ellis, M. O., & Haqq, D. A., & Domino, M. R., & Jones, B. D., & Shaffer, C. A. (2021). Student Perceptions of the Complete Online Transition of Two CS Courses in Response to the COVID-19 Pandemic. *2021 American Society for Engineering Education (ASEE) Annual Conference*. <https://peer.asee.org/37755>.
11. **H.F.F. Mahmoud**. (2021). Parametric Versus Semi and Nonparametric Regression Models. *International Journal of Statistics and Probability*, 10(2):90. 10.5539/ijsp.v10n2p90.
10. I. Kim, L. Shan, J. Lin, W. Gao, B-J. Kim, and **H.F.F. Mahmoud**. (2020). Multiple and multilevel graphical models. *WIREs Computational Statistics* , 12(5), e1497. doi.org/10.1002/wics.1497.
9. S.F. Farhat, A.K. McLean, and **H.F.F. Mahmoud**. (2020). “Welfare Assessment and Identification of the Associated Risk Factors Compromising the Welfare of Working Donkeys (*Equus asinus*) in Egyptian Brick Kilns”. *Animals*, 2020, 10, 1611. [doi:10.3390/ani10091611](https://doi.org/10.3390/ani10091611)
8. **H.F.F. Mahmoud** (2020). Bayesian and Frequentist Approaches Robustness in Variance Components Estimation. *Journal of Statistics Applications and Probability*, 9(3):435. doi: 10.18576/jsap/090301.
7. S.A.A. Khaled, E. NasrEldin, Y.S. Makarem, and **H.F.F Mahmoud**. (2020). Value of Platelet Distribution Width and Mean Platelet Volume in Disease Activity Score of Rheumatoid Arthritis. *Journal of Inflammation Research*, 13:595-606. doi.org/10.2147/JIR.S265811.
6. **H.F.F. Mahmoud**, Byung-Jun Kim, and I. Kim. (2020). “Robust Nonparametric Derivative Estimator”. *Communications in Statistics - Simulation and Computation*, [doi:10.1080/03610918.2020.1722836](https://doi.org/10.1080/03610918.2020.1722836)

5. M.A.H. Abdelhakiem, A.E. Abdelbaset, M. Abd-Elkareem, M.S. Rawy, **H.F.F. Mahmoud**. (2019). “Clinical blood gas indices and histopathological effects of intrathecal injection of tolfenamic acid and lidocaine HCl in donkeys”. *Comparative Clinical Pathology*, 29, 83-93. doi:10.1007/s00580-019-03025-7
4. A.S. AbdelKhalek, H.A. Youssef, M.F. Ali, Magda M. Ali, M.A.H. Abdel-Hakim, **H.F.F. Mahmoud**. (2019). “An assessment of clinical, biometric, cosmetic and microscopic outcomes of four suture techniques for cutaneous closure of laparotomy wounds: an experimental study in rabbits”. *Journal of Dairy Veterinary Animal Research*, 8(1), 42-53.
doi:10.15406/jdvar.2019.08.00241
3. **H.F.F. Mahmoud**, and I. Kim. (2019). Semiparametric Spatial Mixed Effects Single Index Models. *Computational Statistics & Data Analysis*, 136, 108-122.
doi.org/10.1016/j.csda.2019.01.008.
2. **H.F.F. Mahmoud**. (2018). Simultaneous Permutation-Based Change Points Detection Approach with An Application on Chicago Mortality Data. *Journal of Applied Probability and Statistics*, 13(2), 119-131.
1. **H.F.F. Mahmoud**, I. Kim and H. Kim (2016). “Semiparametric Single Index Multi Change Points Model with an Application of Environmental Health Study on Mortality and Temperature”, *Environmetrics*, 27(8), 494-506. doi.org/10.1002/env.2413.

Posters

- M. Farghally, M. Mohammed, **H.F.F. Mahmoud**, M. Ellis, D. Haqq, M. Domino, B. Jones and C. Shaffer. (2020). The online transition of two CS courses in response to COVID-19. *SIGCSE Technical Symposium 2021*.

Conference Proceedings

- o **H.F.F. Mahmoud**, I. Kim. (2020). “Spatio-Temporal Single Index Models for Correlated Data”. In *JSM Proceedings, Nonparametric modeling Section*. Alexandria, VA: American Statistical Association, 1121-1128.
- o **H.F.F. Mahmoud** and A. R. Zahran (2005), “Bayesian Estimation of Variance Components in 3-Fold Nested Mixed Model Using Gibbs Sampling,” *The Proceedings of the 17th International Conference on Statistics, Faculty of Economic and Political Sciences, Cairo University, Egypt*, pp. 123-140.

Submitted Papers

- o **H.F.F. Mahmoud** and I. Kim. (2021). Semiparametric Change Points Detection Using Single Index Spatial Random Effects Model. *Biometrical Journal*.

Working in progress

- o **H.F.F. Mahmoud** and I. Kim, “Semiparametric Integrated and Additive Spatio-Temporal Single Index Models”.
- o Yun+, Y, **H.F.F. Mahmoud**, and Kim. Semiparametric random change point estimation.

Research & Collaboration Experience **Lead Statistical Collaborator:** Virginia Tech Laboratory for Interdisciplinary Statistical Analysis (LISA), Blacksburg, Virginia Tech Spring 2013-September 2014

- o Collaborated on over 25 projects with Virginia Tech faculty and graduate students from a variety of disciplines and improved their research with statistics.
- o Held weekly walk-in consulting hours where researchers would ask specific statistics questions.
- o Researched and utilized a broad range of statistical techniques including, but not limited to, Parametric and nonparametric regression models, spatial analysis, repeated measurement ANOVA, zero-inflated models, and experimental design methodology.
- o Mentored a group of associate collaborators to refine their statistical and collaboration skills.

LISA Associate Collaborator Fall 2010, Summer I 2011, and Summer II 2012
 Statistics Department, Virginia Tech
 Supervisor: Eric Vance, PhD

Research Assistant Summer I 2012 and Summer II 2013
 Statistics Department, Virginia Tech
 Supervisor: I Kim, Ph.D

Presentations and Talks

- “Spatio-Temporal Single Index Models for Correlated Data”, The Joint Statistical Meetings Conference (JSM), Virtual Conference, August 2020.
- “Spatio-Temporal Mixed Effects Single Index Models”, ENAR Virtual Conference, March 2020.
- “Semiparametric Spatial Mixed Effects Change Points Single Index Model.”, The Joint Statistical Meetings Conference (JSM), Denver, Colorado July 2019
- “Robust Nonparametric Derivative Estimator”, Eastern North American Region Conference (ENAR), Philadelphia, PA March, 2019
- “Semi/nonparametric Robust Derivative Estimator”, *The 28th International Conference on Statistics, Faculty of Economic and Political Sciences, Cairo University, Egypt* March 2016
- “Semiparametric Single-index Modeling for Spatio-Temporal Data.”, The Joint Statistical Meetings Conference (JSM), Seattle, Washington August 2015
- “Semiparametric single-index modeling for spatially correlated data”, Virginia Academy of Science Conference, Statistics Session, 93rd Annual Meeting, James Madison University, Harrisonburg, Virginia. May, 2015
- “Semiparametric Nonseparable Spatial-Temporal Single Index Model”, Eastern North American Region Conference (ENAR), Miami, Florida March, 2015
- “Semiparametric Spatial Single Index Modeling for Spatially-Temporally Correlated Data.”, Colloquium, Department of Statistics, Virginia Tech, Blacksburg, Virginia October 2014

- “Semiparametric Spatial Single Index Models.”, The Joint Statistical Meetings Conference (JSM), Boston, Massachusetts August 2014
- “Multiple Change Points Detection”, Virginia Academy of Science Conference, Statistics Session, 92nd Annual Meeting, Virginia Commonwealth University, Richmond, Virginia. May, 2014
- “Single Index Change Points Model and an Application of Environmental Health Study”, Eastern North American Region Conference (ENAR), Baltimore, MD March, 2014

- Short Courses and Workshops delivered**
- o “Linear modeling of real data” Short Course, Assiut University, Egypt. March 2017.
 - o “SAS” Workshop, Faculty of Economic and Political Sciences (FEPS) at Cairo University, Cairo, Egypt. May 2016.
 - o “Parametric versus Semi/nonparametric Regression Models” Short Course, Laboratory for Interdisciplinary Statistical Analysis (LISA) at Virginia Tech, Blacksburg, Virginia. July 2014.

- Awards & Honors**
- * The Virginia Tech Favorite Faculty Award 2021 - Practice Civility - by the Housing and Residence Life, and the Student Affairs Division at Virginia Tech.
 - * Jesse C. Arnold Award for Teaching Excellence, The Department of Statistics, Virginia Tech, academic year 2012-2013.
 - * Nominated for Graduate Teaching Excellence - Instructor of Record Award - at Virginia Tech by the statistics department - 2014.
 - * Travel Fund Award, GSA Travel Fund Program (TFP), Virginia Tech Fall 2014
 - * Inducted into Mu Sigma Rho: National Statistical Honor Society - Virginia Tech chapter, Fall 2011.
 - * Virginia Tech’s Open Access Subvention Fund (OASF) (\$3200.48) 2020-present.

- Grants & Scholarships**
- o Teaching Assistant, Statistics Department, Virginia Tech Aug. 2012 - 2014
 - o Governmental scholarship from the Egyptian government Aug. 2009 - Aug. 2012

- Committee Chair and Advisor**
- * Vartan Kesiz Abnoui (3/2021-present, chair): Master of Arts in Data Analysis and Applied Statistics (DAAS), Virginia Tech.
 - * Jonilda Bahja (2018-2022, chair): Master of Arts in Data Analysis and Applied Statistics (DAAS), Virginia Tech.
 - * Nicholas Brown (2020-2021, committee member): Master of Arts in Data Analysis and Applied Statistics (DAAS), Virginia Tech.
 - * Ahmed AbdelRehim (2016-2019, advisor): Master of Statistics and Insurance, “Loss rate prediction in general insurance using fuzzy set theory with an application on two insurance branches: Airline and ship bodies in Misr insurance company”, Assiut University, Egypt.

- Departmental Services**
- Coordinator of the STAT 3615 Biological statistics course [non-Neuro sections] Fall 2018 - Fall 2019
 - Undergraduate program committee and Teaching Evaluation committee [2019-2022], and Service Course Pedagogy committee [2019-2020], Department of Statistics, Virginia Tech

- Community service and environmental committee, Department of Statistics, Mathematics and Insurance, Assiut University, Egypt 2016/2017
- Department Committee Board member, Department of Statistics, Mathematics and Insurance, Assiut University, Egypt 2015/2016
- Graduate Studies Committee, Department of Statistics, Mathematics and Insurance, Assiut University, Egypt 2015/2016

Computer Skills

- * Statistical Packages: SAS, R, SPSS, Minitab, OpenBUGS, and JMP.
- * International Computer Driving License (ICDL), Version 4
- * Designing Home Web Page: FrontPage, Digital image, and flash
- * L^AT_EX

Academic Activities

- Paper Reviewer
 - * Journal of Statistical Computation and Simulation [7], Statistics in Medicine [1], PLOS One [1], Mathematics [4], Journal of Communications for Statistical Applications and Methods [1], 3rd International Conference on Humanities, Social Sciences and Education (ICHSSE) [3], Sultan Qaboos University Journal for Science for consideration of publication (SQUJS) [1], Austrian Journal of Statistics [1], American Journal of Translational Research [1], Asian Journal of Probability and Statistics [3], Veterinary Record [2], Journal of the Korean Statistical Society [1], Pakistan Journal of Statistics [1], and Asian Journal of Advances in Research [1].
- Books Reviewed
 - * Statistics: Concepts and Controversies, 16th ed. by David S. Moore and William I. Notz.
 - * Significant Statistics, online edition on VT website adapted by John Russell (2021).
- Applications Reviewer
 - * Reviewer for the “Pooled Monitoring Initiative’s Restoration Research Award Program” - Chesapeake Bay Trust 2020, and 2022.

Memberships & Services

- o American Statistical Association 2013-present
- o Mu Sigma Rho, the National Statistics Honorary Society 2010-present
- o Council of International Student Organizations (CISO) at Virginia Tech 2012-2014
- o Commission of Student Affairs (CSA) at Virginia Tech 2012/2013
- o President: Egyptian Student Association at North America (ESANA), Blacksburg Chapter 2011-2012