

Zeynep KALAYLIOGLU  
Assoc. Prof. of Statistics

## WORK EXPERIENCE

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- 2014-Current Associate Professor of Statistics at MIDDLE EAST TECHNICAL UNIVERSITY  
2009-2014 Assistant Professor of Statistics at MIDDLE EAST TECHNICAL UNIVERSITY  
2007-2009 Instructor at MIDDLE EAST TECHNICAL UNIVERSITY, DEPARTMENT OF STATISTICS  
2002-2007 Biostatistical researcher at INFORMATION MANAGEMENT SERVICES, INC., BETHESDA MD USA for NATIONAL CANCER INSTITUTE, BETHESDA MD USA

## EDUCATION

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- 2002 Ph.D. in STATISTICS, **North Carolina State University**, Raleigh USA  
Thesis: "Bayesian and Frequentist Unit Root Tests in Stochastic Volatility Models"  
Advisors: Prof. Sastry PANTULA and Prof. Sujit K. GHOSH  
2000 M.S. in STATISTICS, **North Carolina State University**, Raleigh USA  
Minor: Computational Engineering and Sciences

## RESEARCH INTEREST

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I have been interested in developing novel Bayesian methodology for various different problems such as nonignorably missing data handling and multi-level data modeling. My current interest lies in Bayesian analysis of circular data and model selection.

## TEACHING EXPERIENCE

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I have taught several theoretical and computational graduate and undergraduate courses over the years including Mathematical Statistics, Computational Statistics, Statistical Computing, R, Matlab, Probability, Categorical Data Analysis, and Theory of Statistical Inference. My main interest lies in teaching theoretical courses.

## PUBLICATIONS

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- Camli, O. and **Kalaylioglu, Z.**, (2018), "Bayesian predictive model assessment and comparison in longitudinal circular-linear models," (under review)
- Kilic, M.B., SenGupta, A., **Kalaylioglu, Z.**, (2018), "Flexible modeling for multi-modal circular data using Bayesian semi-parametric mixture models," Canadian Journal of Statistics (under review)
- Hassanzadeh, F. and **Kalaylioglu, Z.**, (2018), "A new multimodal and asymmetric bivariate circular distribution," Environmental and Ecological Statistics, <https://doi.org/10.1007/s10651-018-0409-3>
- Tanju, O. and **Kalaylioglu, Z.**, (2018), "A cluster tree based model selection approach for logistic regression classifier," Journal of Statistical Computation and Simulation, 88(7), 1394-1414
- Karagulle, S. and **Kalaylioglu, Z.**, (2016), "Score test for etiologic heterogeneity in two stage polytomous logistic regression," Journal of Applied Statistics, 43(3), 538-54

## PUBLICATIONS

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**Kalaylioglu, Z.** and Demirhan, H., (2015), "A joint Bayesian approach for the analysis of response measured at a primary endpoint and longitudinal continuous covariates," *Statistical Methods in Medical Research*, 26(6), 2885-2896

Demirhan, H. and **Kalaylioglu, Z.**, (2015), "On the generalized multivariate Gumbel distribution," *Statistics and Probability Letters*, 103, 93-99

Demirhan, H. and **Kalaylioglu, Z.**, (2015), "Joint prior distributions for variance parameters in normal hierarchical models," *J. of Multivariate Analysis*, 135,163-174.

Yildirak, K., **Kalaylioglu, Z.**, Mermer, A., (2015), "Bayesian estimation of crop yield function: Drought based wheat prediction model," *J. of Environmental and Ecological Statistics*, 22, 693-704

Ozgu-Erdinc S, Iskender C, Uygur D, Oksuzoglu A, Seckin KD, Yeral MI, Kalaylioglu, Z., Yucel A, Danisman AN, (2015), "One-hour versus two-hour postprandial blood glucose measurement in women with gestational diabetes mellitus: which is more predictive?," *Endocrine*, DOI 10.1007/s12020-015-0813-5 Kalafat, E., Yuce, T., Konuralp, B., Katlan, D. C., Kalaylioglu, Z., Beksac, M., Koc, A., Soylemez, F.,(2015), "Effects of in-utero cord blood collection on post-cesarean hemoglobin levels," *European Journal of Obstetrics, Gynecology and Reproductive Biology*, 193, 123-126

**Kalaylioglu, Z.**, (2014), "Performances of Bayesian model selection criteria for generalised linear models with nonignorably missing covariates," *J. of Statistical Computation and Simulation*, 84(8),1670-1691.

Karatayli, S.C., Bozdayi, A.M., Karatayli, E., Ozturk, T., Husseini, A.A., Albayrak, R., Ozkan, M., **Kalaylioglu, Z.**, Yalcin, K., Cinar, K., Idilman, R., Yurdaydin, C., (2014), "Interleukin-28 gene polymorphisms may contribute to hbsag persistence and the development of hbeag-negative chronic hepatitis b," *Liver International*, DOI: 10.1111/liv.12595.

**Kalaylioglu, Z.**, Bozdemir, B., Ghosh S. K., (2013), "Bayesian unit root test in stochastic volatility models with correlated errors," *Hacetupe J. of Mathematics and Statistics* 42(6),659-669.

**Kalaylioglu, Z.** and Ozturk, O., (2013), "Bayesian semiparametric models for nonignorable missing mechanisms in generalized linear models," *J. of Applied* 40(8),1746-1763.

Senses, K.M., Gonen, M., Barutcu, A.R., **Kalaylioglu, Z.**, Isbilen, M., Konu, O., Chen, Y.T., Altorki, N.K., and Gure, A.O., (2013), "Cancer-testis gene expression is associated with the methylenetetrahydrofolate reductase 677 CT polymorphism in nonsmall cell lung carcinoma," *BMC Medical Genetics* (<http://www.biomedcentral.com/1471-2350/14/97>).

Beklioglu, M., Bezirci, G., Akkas, S.B., Rinke, K., Yildirim, F., **Kalaylioglu, Z.**, Severcan, F., (2012), "Impacts of Salinity and Fish-Exuded Kairomone on the Survival and Macromolecular Profile of *Daphnia Pulex*," *Ecotoxicology*, 21(2), 601-614.

Dogan, L., **Kalaylioglu, Z.**, Karaman, N., Ozaslan, C., Atalay, C., Altinok, M., (2011), "Relationships Between Epidemiological Features and Tumor Characteristics of Breast Cancer," *Asian Pacific Journal of Cancer Prevention*, 12(12), 3375-3380.

**Kalaylioglu, Z.** and Ghosh S. K., (2009), "Bayesian unit root tests for stochastic volatility models," *Statistical Methodology*, 6(2), 189-201

## PUBLICATIONS

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Vural, B., Demirkan, A., Ugurel, E., **Kalaylioglu, Z.**, Esen, B.A., Gure, A.O., Gl, A., Ozbek, U., (2009), "Seroreactivity against PTEN-induced putative kinase 1 (PINK1) in Turkish patients with Behcets disease," *Clinical and Experimental Rheumatology*, 27(2 Suppl 53):S67-72.

Chatterjee, N., **Kalaylioglu, Z.**, Shih J., Gail M., (2007), "Letter to the editor," *Biometrics*, 63, 964-966.

Sherman, M.E., Rimm, D.L., Yang, X., Chatterjee, N., Brinton, C., Lissowska, J., Peplonska, B. Szeszenia D., Mikolajczak, A.B., Zatonski, W., Cartun, R., Mandich, D., Rymkiewicz, G., Sikor, D.M, Lukaszek, S., Kordek, R., **Kalaylioglu, Z.**, Harigopal, M., Charrette, L., Falk, R.T., Richesson, D., Anderson, W.F. , Hewitt, S.M., Closas, M.G., (2007), "Variation in breast cancer hormone receptor and HER2 levels by etiologic factors: A population-based analysis," *International Journal of Cancer*, September 1; 121(5): 1079-85

Saatci, E.,Kocak, Y., Akpinar, E., **Kalaylioglu-Wheeler, Z.**, (2007), "Effect of chemotherapy on quality of life in patients with lymphoma," *Marmara Medical Journal*, 20(2), 98-103

Chatterjee, N., **Kalaylioglu, Z.**, Moslehi, R., Peters, U., Wacholder, S., (2006), "Powerful multi-locus tests for genetic association in the presence of gene-gene and geneenvironment interactions," *American Journal of Human Genetics*, Vol. 79(6),1002-1016

Chatterjee, N., **Kalaylioglu, Z.**, Shih J., Gail M., (2006), "Case-control and caseonly designs with genotype and family history data: Estimating relative-risk, familial aggregation and absolute risk," *Biometrics*, 62(1), 36-48.

Garcia-Closas, M., Brinton, L. A., Chatterjee, N., Peplonska B., Szeszenia-Dabrowska, N., Bardin Mikolajczak, A., Zatonski, W., Blair, A., Anderson, W. F., Rymkiewicz, G., Mazepa-Sikora, D., Kordek, R., Lukaszek, S., Kalaylioglu, Z., Sherman, M., (2006), "Established breast cancer risk factors by clinically important tumor characteristics," *British Journal of Cancer*, 95(1),123-129

Chatterjee, N., **Kalaylioglu, Z.**, Carroll, R. J., (2005), "Exploiting gene-environment independence in family based case-control studies: Increased power for detecting associations, interactions, and joint effects," *Genetic Epidemiology*, 28, 138-156

Hisada, M., Chatterjee, N., **Kalaylioglu, Z.**, Battjes, R. J., Goedert, J. J., (2005), "Hepatitis C virus load and survival among injection drug users in the United States," *Hepatology*, 42(6), 1446-1452

## SELECTED PRESENTATIONS

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(Presenters are starred)

Camli, O. and Kalaylioglu, Z.\* , (2017), "Bayesian predictive model comparison in complex circular models," *Advances in Directional Statistics Workshop*, 2017, Rome Italy

Camli, O\* . and Kalaylioglu, Z., (2017), "A Bayesian longitudinal circular model and model selection," 10th International Statistics Congress, 2017, Ankara Turkey

Kalaylioglu, Z., (2015), "Bayesian analysis of directional data," *Department of Statistics*, 2015, Isfahan, Iran

Kalaylioglu, Z.\* and Demirhan, H., (2015), "A joint Bayesian analysis for cross sectional response and longitudinal covariate," 9th Annual International Conference on Mathematics and Statistics, Athens, Greece

Kalaylioglu, Z.\* and Demirhan, H., (2015), "A joint Bayesian analysis for cross sectional response and longitudinal covariate," *International Biometric Society*, 8th. EMR Meeting, Cappadocia, Turkey

## SELECTED PRESENTATIONS

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Demirhan, H.\* and Kalaylioglu, Z.\*, (2014), "A Joint prior for variance components in random effects models," 8th International Biometric Society-Eastern Mediterranean Region, Florence, Italy, (poster)

Demirhan, H.\* and Kalaylioglu, Z.\*, (2014), "A joint prior for variance components in random effects models," Bayesian Biostatistics, Zurich, Switzerland, (poster)

Kilic, B.\* and Kalaylioglu, Z., (2013), "A Bayesian model for forecast in correlated directional data: A wind direction example," EAWE 9th. Ph.D. seminars in Wind Energy, Visby, Sweden, (poster)

Demirhan, H. and Kalaylioglu, Z.\*, (2013), "Joint prior distributions for variance parameters in normal hierarchical models," 7th International Workshop on Simulation, Rimini, Italy

Demirhan, H. and Kalaylioglu, Z.\*, (2012), "Joint prior distributions for variance parameters in normal hierarchical models," Institut fur Mathematische Stokastik, Otto von Guericke Universitat, Magdeburg, Germany

Kalaylioglu, Z.\*, (2012), "Bayesian model selection criteria in generalized linear models with nonignorably missing covariates," Applied Statistics Conference, Ribno, Slovenia

Kalaylioglu, Z.\*, (2012), "Bayesian model selection criteria in generalized linear models with nonignorably missing covariates," 14th National Biostatistics Congress, Kayseri, Turkey

Kalaylioglu, Z.\* and Ozturk, O., (2011), "Bayesian semiparametric models for nonignorable missing mechanisms in generalized linear models," International Research Conference on Bayesian Learning, Istanbul, Turkey

Kalaylioglu, Z.\* and Ozturk, O., (2011), "Bayesian semiparametric models for nonignorable missing mechanisms in generalized linear models," International Biometric Society, 6th. EMR Meeting, Hersonissos, Crete

Kalaylioglu, Z.\* and Ozturk, O., (2011), "Bayesian semiparametric models for nonignorable missing mechanisms in generalized linear models," METU Department of Health Informatics, Ankara, Turkey

Kalaylioglu, Z.\* and Ozturk, O., (2011), "Bayesian semiparametric models for nonignorable missing mechanisms in generalized linear models," Ankara University Department of Statistics, Ankara, Turkey

Kalaylioglu, Z.\*, (2009), "Role of statistics in genetic association studies: an overview and update," Workshop in Recent Developments in Applied Probability and Statistics, METU Institute of Applied Mathematics, Ankara, Turkey

Chatterjee, N., Kalaylioglu, Z.\*, Carroll, R. J., (2006), "Exploiting gene-environment independence in family based case-control studies," METU Department of Statistics, Ankara, Turkey

Kalaylioglu, Z.\* and Pantula, S., (2003), "Frequentist unit root tests in stochastic volatility models, American Statistical Association Meetings, San Fransisco, USA

Kalaylioglu, Z.\* and Ghosh, S.K., (2002), "Bayesian unit root tests in stochastic volatility models," American Statistical Association Meetings, New York City, USA

Kalaylioglu, Z.\* and Ghosh, S.K., (2001), "Bayesian unit root tests in stochastic volatility models, NBER/NSF Time Series Workshop, Raleigh, USA

## SUPERVISING

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### *Doctoral Supervision:*

Sezgin Ciftci (ongoing), "Bayesian model averaging for the analysis of generalized linear models with nonignorably missing covariates"

Melek Er (ongoing), "A novel GIS based statistical prediction model for archaeological site prediction in Aegean Turkey"

Tugba Erdem (ongoing), "A Bayesian joint model for recurrent event times and longitudinal covariates"

Burak Kilic (2015), "Bayesian circular data modeling"

### *Master Supervision:*

Oguz Ozdemir (ongoing), "Robustness of Bayesian analysis in data structures with cross sectional response and longitudinal covariates"

Onur Camli (2017), "Bayesian modeling and model selection for circular longitudinal data "

Ozge Tanju (2016), "Cluster based model diagnostics for logistic regression"

Gulsum Cinar Dolgun (2013), "Performances of missing data handling methods in surveys"

Saygin Karabulut (2013), "Score test for etiologic heterogeneity in two stage polytomous logistic regression"

Icten Tansel (2013), "A statistical cluster theoretic model for forgery analysis in archaeology"

Tugba Erdem (2011), "Modeling diseases with multiple disease characteristics: Comparison of models and estimation methods"

Olcay Ozturk (2011), "Bayesian semiparametric modeling for nonignorably missing covariates"

## REVIEWS

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Computational Statistics; Hacettepe Journal of Mathematics and Statistics; CRC Taylor And Francis book review; Computational Statistics and Data Analysis; Journal of Statistical Computation and Simulation; Journal of Applied Statistics; Statistica Neerlandica; Studies in Nonlinear Dynamics and Econometrics; Statistical Papers; Journal of Computational and Applied Mathematics; Environmental and Ecological Statistics; Journal of Statistical Software; International Symposium on Health Informatics and Bioinformatics; Section on Bayesian Statistical Science - American Statistical Association, Graduate student paper competition.

## PROJECTS

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January, 2016 - December 2016, METU Scientific Research Project: Model selection in binary regression (principle investigator)

January, 2015 - December 2015, METU Scientific Research Project: Bayesian model averaging for the analysis of generalized linear models with covariates subject to nonignorable missingness (principle investigator)

## PROJECTS

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July 2009 - December 2011, EU FB-7: Short and long term effects of genetically modified organisms on animal health (statistical analyst)

July 2009 - 2011, TUBITAK 1002: Cancer testis gene expression as biomarker for methylenetetrahydrofolate reductase polymorphism in nonsmall cell lung cancer (statistical researcher)

May 2009 - June 2010, Undersecretariat of Treasury: Construction of Turkish morbidity tables-incidence and prevalence estimation (researcher)

February 2009 - February 2010, METU Scientific Research Project: Bayesian unit root test for stochastic volatility models with leverage effect (principle investigator)

Intramural Research Program of the National Cancer Institute USA (completed in 2007): Variation in breast cancer hormone receptor and HER2 levels by etiologic factors: A population-based analysis (data analyst)

Intramural Research Program of the National Cancer Institute, Division of Cancer Epidemiology and Genetics, USA and FIS/Spain (00/0745, G03/174, G03/160, C03/09, C03/10) (completed in 2007): Large scale evaluation of candidate genes identities associations between VEGF polymorphisms and bladder cancer risk (data analyst)

Intramural Research Program of the National Cancer Institute, USA (completed in 2007): Transforming growth factor beta 1 (TGFB1) gene polymorphisms and risk of advanced colorectal adenoma (data analyst)

Intramural Program of the National Institutes of Health, USA (completed in 2006): Powerful multi-locus tests for genetic association in the presence of gene-gene and gene-environment interactions (researcher)

Intramural Research Program of the National Cancer Institute USA (completed in 2006): Established breast cancer risk factors by clinically important tumor characteristics (data analyst)

Intramural Research Program of the National Cancer Institute, Division of Cancer Epidemiology and Genetics, USA and FIS/Spain (00/0745, G03/174, G03/160, C03/09, C03/10) (completed in 2006): Genetic Variation in the Nucleotide Excision Repair Pathway and Bladder Cancer Risk (data analyst)

National Cancer Institute (CA-57030) and National Institute of Environmental Health Sciences (P30-ES09106), USA (completed in 2005): Exploiting gene-environment independence in family-based case-control studies- Increased power for detecting associations, interactions, and joint effects (researcher)

Intramural Research Program of the National Cancer Institute USA (completed in 2005): Hepatitis C virus load and survival among injection drug users in the United States (data analyst)

National Cancer Institute (CA-90302, CA-57030) and National Institute of Environmental Health Sciences (P30-ES09306), USA (completed in 2005): Analysis of casecontrol studies of genetic and environmental factors with missing genetic information and haplotype-phase ambiguity (data analyst)

National Cancer Institute and Texas AM Center for Environmental and Rural Health, USA (completed in 2005): Semiparametric maximum likelihood estimation exploiting gene-environment independence in case control studies (computational statistician)

## OTHER PROFESSIONAL DUTIES

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Adjunct Faculty at Department of Archaeometry

Assistant to the Head, Department of Statistics (2015-)

Erasmus Coordinator, Department of Statistics (2009-)

Advisor of METU Statistics Student Club (2017-)

Elected representative of Assistant Professors, Faculty of Arts and Sciences Board (2012-2014)

Assistant to the Manager, METU Center for Wind Energy Research (2014-2017)

## LANGUAGES

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TURKISH: Mothertongue

ENGLISH: Fluent

GERMAN: Basic Knowledge

## INTERESTS AND ACTIVITIES

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Yoga practice, its philosophy, anatomy, and relation with the nervous system; gardening and garden design; olive and grapevine hobby farming

## CONTACT INFORMATION

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