

Ayşen (DENER) AKKAYA

Professor

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Department of Statistics
Middle East Technical University
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Education

| Degree | Field | University |
|---------------|--------------|--|
| B.Sc. | Statistics | Middle East Technical University, 1985 |
| M.Sc. | Statistics | Middle East Technical University, 1987 |
| Ph.D. | Statistics | Middle East Technical University, 1995 |

Research Interests

Random functions and applications, Time series analysis, Stochastic processes, Risk and decision analysis, Stochastic modeling in earthquake engineering, Seismic hazard analysis and earthquake insurance, Reliability, Robust inference, Autoregression.

Academic Positions

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| 1985- 1992 | Research Assistant, Department of Statistics, Middle East Technical University |
| 1992-1998 | Instructor, Department of Statistics, Middle East Technical University |
| 1997-1998 | Visiting Fellow, Department of Civil Engineering and Operations Research, Princeton University, USA. |
| 1998-2002 | Assistant Professor, Department of Statistics, Middle East Technical University |
| 2002-2007 | Associate Professor, Department of Statistics, Middle East Technical University |
| 2008 | Professor |

Scholarships and Honors

First rank in the graduates of Department of Statistics, 1985.

Scholarship of the Scientific and Technical Research Council of Turkey for graduate studies (Ph. D), 1993.

Middle East Technical University Prof. Dr. Mustafa N. Parlar Education and Research Foundation Ph. D Thesis Award, 1996.

Postdoctoral Research Scholarship awarded by the Scientific and Technical Research Council of Turkey within the scope of NATO Science Fellowship, 1997.

Administrative Positions:

- Associate Chairperson, METU, Department of Statistics, 2001(Feb)-2004(Jan)
- Associate Chairperson, METU, Department of Statistics, 2007-2008

Publications

a) Research Papers

International:

1. Köksoy, C., Kuzu, A., Erden , İ. and Akkaya, A. D., “The Risk Factors in Central Venous Catheter Related Thrombosis”, *The Australian New Zealand Journal of Surgery*, 65, 823-825, 1995.
2. Akkaya, A. D. and Yüçemen, M. S., “Estimation of Earthquake Hazard Based on Extremes of Local Integral Random Functions”, *Engineering Geology*, 58, 53- 66, 2000.
3. Akkaya, A. D. and Tiku, M. L., “Estimating Parameters in Autoregressive Models in Non-normal Situations: Asymmetric Innovations”, *Commun. Statist. Theory and Methods*, 30(3), 517-536, 2001.
4. Akkaya, A. D. and Tiku, M. L., “Corrigendum to “Time Series Models with Asymmetric Innovations” ”, *Commun. Statist. Theory and Methods*, 30(10), 2227- 2230, 2001.
5. Akkaya, A. D. and Yüçemen, M. S., “Stochastis Modeling of Earthquake Occurrences and Estimation of Seismic Hazard: A Random Field Approach”, *Probabilistic Engineering Mechanics*, 17(1), 1-13, 2001.
6. Akkaya, A. D. and Tiku, M. L. (2005). “Robust Estimation and Hypothesis Testing Under Short-tailedness and Inliers”. *Test* , 14(1), pp. 129-150.
7. Akkaya, A. D. and Tiku, M. L. (2005). ”Time series AR(1) model for short-tailed distributions”, *Statistics*, 39(2), pp.117-132.
8. Akkaya, A. D. and Tiku, M. L. (2005). “Modified Maximum Likelihood Estimators for Autoregressive Models”. *Commun. Statist. Theory and Methods*, 34, 1243-1244.
9. Akkaya, A. D. ve Yılmaz, Y. E., “Analysis of Variance and Linear Contrasts in Experimental Design with Generalized Secant Hyperbolic Distribution”. *Journal of Computational and Applied Mathematics*,216, 545-553 (2008).
10. Akkaya, A. D. ve Tiku, M. L., “Robust Estimation in Multiple Linear Regression Model with Non-Gaussian Noise”. *Automatica*, **44**, 407-417 (2008).
11. Akkaya, A. D. ve Tiku, M. L., “Autoregressive Models with Short-tailed Symmetric Distributions”. *Statistics*, **42**, 3, 207-221 (2008).
12. Akkaya, A. D. ve Tiku, M. L., “ Short-tailed Distributions and Inliers”. *Test*, **17**, 282-296 (2008).
13. Akkaya, A. D. ve Tiku, M. L., “Estimating Parameters in Autoregressive Models with Asymmetric Innovations”. *Statistics and Probability Letters*, 5-6 (2008).

14. Tiku, M. L. and Akkaya, A. D., “Estimation in Multifactor Polynomial Regression under Non-normality” (invited paper). *Pak. J. Statistics*, 25(4) (2010).
15. Akkaya, A. D. and Bayrak Ö. T., “Estimating Parameters of a Multiple Autoregressive Model by the Modified Maximum Likelihood Method”. *Journal of Computational and Applied Mathematics* , 233,1763-1772 (2010).
16. Tiku, M. L. and Akkaya, A. D., “Random Design in Regression Models” (invited paper). *JISAS*. 64(2) 157-170 (2010).
17. Akkaya, A. D., and Yucemen, M. S., “ Robust Estimation of Magnitude-Frequency Relationship Parameters”, *Structural Safety*, 38, 32-39 (2012).
18. Şahinoğlu, M, Akkaya A. D. and Ang, D.,” Can We Assess and Monitor Privacy and Security Risk for Social Networks”, *Procedia Social and Behavioral Sciences*, 57, 163-169 (2012).
19. Akkaya, A. D., Balcı, S., and Ülgen B. E., “Modified Maximum Likelihood Estimators Using Ranked Set Sampling”, *Journal of Computational and Applied Mathematics* , 238,171-179 (2013).

National:

1. Dener, C., İnan, A. and Akkaya, A. D., “Puerperal Mastitis and Abscesses”, *Clinical Sciences and Doctor*, 7(2), 182-186, 2001.
2. Türker, Ö., and Akkaya, A. D., “Basit Doğrusal Otoregresif Modeller Sisteminde Parametre Tahmini ve Hipotez Testi: Simetrik İnovasyonlar”, *Journal of Statistical Research*, 75-91, 2005.

b) Chapters in Books:

1. Yucemen, M. S. and Akkaya, A. D., “A Comparative Study of Stochastic Models for Seismic Hazard Estimation”, *Land-Based and Marine Hazards: Scientific and Management Issues, Series on Advances in Natural and Technological Hazards Research*, ed. M. I. El-Sabh, S. Venkatesh, H. Denis ve T. S. Murty, 5-24, Kluwer Academic Publishers, The Netherlands, 1995.
2. Akkaya, A. D. and VanMarcke, E., “Estimation of Spatial Correlation of Soil Parameters Based on Data from the Texas A&M University NGES”, *Probabilistic Site Characterization at the National Geotechnical Experimentation Sites*, ASCE Geotechnical Special Publication, ed. E. H., VanMarcke and G. A. Fenton, No. 121, pp. 29-40, New York, 2003.

c) Book

1. Tiku, M. L. and Akkaya, A. D. *Robust Estimation and Hypothesis Testing*. New Age International Publishers (P): New Delhi, 2004.

d) Articles published in Conference Proceedings (refereed)

International:

1. Akkaya, A. D. and Sungur, E., "Some New Models for Multivariate Extremes", The Frontiers of Statistical Computation, Simulation and Modeling, Proceedings of the First International Conference on Statistical Computing, İzmir, Vol. I, 185-196, American Sciences Press, Ohio, 1987.
2. Akkaya, A. D. and Yüçemen, M. S., "A Non-Gaussian Random Field Model for Earthquake Occurrences", Proceedings, 50th Session of the International Statistical Institute, Vol. I, Beijing, China, 30-31, 1995.
3. Akkaya, A. D. and Yüçemen, M. S., "Seismic Hazard Assessment for the North Anatolian and San Andreas Faults Based on Random Field Models", Proceedings of the 8th International Conference on Applications of Statistics and Probability, Sydney, Vol. I, 511-519, A. A. Balkema, Rotterdam, 2000.
4. Akkaya, A. D. and Yüçemen, M. S., "Probabilistic Site Characterization in Geotechnical Engineering", Proceedings of the 4th International Congress on Advances in Civil Engineering, Gazimağusa, Vol. IV, 1809-1818, 2000.
5. Yüçemen, M. S. and Akkaya, A. D., " Probabilistic Assessment of Earthquake Insurance Premiums", Proceedings of the 3rd Cairo Earthquake Engineering Symposium on Earthquake Preparedness and Response, 83-109, Cairo, 2000.
6. Balçı, S. ve Akkaya, A.D., "Pairwise Multiple Comparisons under Short-tailed Symmetric Distribution", Proceedings of the Joint ENBIS-DEINDE 2007 Conference, Torino, (2007),.
7. Akkaya, A. D., " Robust Estimation in Multiple Linear Regression Model ", VI International Symposium on Optimization & Statistics (ISOS 2008), Aligarh, India (2008).
8. Akkaya, A. D. and Tiku, M. L., "Symmetric Short-tailed Distributions and Applications". Proceedings, 57th Session of the International Statistical Institute, 242, South Africa, (2009).
9. Akkaya, A. D., Şener, C., Ülgen, E. B. and Kocair, Ç., "Seismic Risk Assessment: A Grid-based Approach for the South-East European Region", SEE-GRID-SCI User Forum 2009, 29-34, İstanbul, (2009).
10. Bayrak (Türker), Ö. and Akkaya, A. D., " Autoregressive Models with Stochastic Design Variables and Non-normal Innovations", Recent Researches in Applied Mathematics, Simulation and Modeling, Proceedings of the 5th International Conference on Applied Mathematics, Simulation, Modeling (ASM'11), ISSN: 1792-4332, ISBN: 978-1-61804-016-9, 97-201, Corfu Island, Greece (2011).
11. Akkaya, A.D., Sahinoglu, M, Morton, S. and Phoha, V., " A Quantitative Security and Privacy Risk Assessment and Management Method for Social Networks", Proceedings, 58th Session of the International Statistical Institute, 10 pages, Dublin (2011).
12. Akkaya, A. D. and Yüçemen, M. S., "Robust Estimation of Engineering Parameters", *Proceedings of the 5th Asian-Pacific Symposium on Structural Reliability and its Applications Sustainable Civil Infrastructures - Hazards, Risk, Uncertainty*, p. Ed. Phoon, K. K., Beer, M., Quek, S. T. and Pang, S. D. ISBN: 978-981-07-2219-7, pp. 235-241 (2012).

13. Akkaya, A. D., and Yüçemen, M. S., “Seismic Hazard Assessment based on a Random Field Model”, *Proceedings of the 5th Asian-Pacific Symposium on Structural Reliability and its Applications Sustainable Civil Infrastructures - Hazards, Risk, Uncertainty*, p. Ed. Phoon, K. K., Beer, M., Quek, S. T. and Pang, S. D. ISBN: 978-981-07-2219-7 pp. 237-243 (2012).

National

1. Akkaya, A. D. ve Yüçemen, M. S., “Deprem Tehlikesinin Tahmininde Değişik Stokastik Modeller ve Karşılaştırılmaları”, Üçüncü Ulusal Deprem Mühendisliği Konferansı Bildiriler Kitabı, 466-475, İstanbul, 1995.
2. Akkaya, A. D. ve Yüçemen, M. S., “Rassal Süreçler ve Jeoteknik Verilere Uygulanması”, YA/EM 2000-Yöneyem Araştırması ve Endüstri Mühendisliği XXI. Ulusal Kongresi Bildiriler Kitabı, 315-317, Gazimağusa, 2000.
3. Akkaya, A. D. ve Çığşar, C. “ Goodness-of-fit Tests Based on Censored Samples”, IV. İstatistik Kongresi Bildiriler Kitabı, 17-22, Antalya, 2005.
4. Akkaya, A. D., Ülgen, B. E., Kocair, Ç. and Şener, C. "Sismik Risk Değerlendirmesi - Güney Doğu Avrupa Bölgesi İçin Grid Tabanlı Bir Yaklaşım", BAŞARIM'10 - II. Ulusal Yüksek Başarımlı ve Grid Hesaplama Konferansı Bildiri Kitabı, ISBN: 978-975-561-373-4, Editörler: Turgay Altılar ve Can Özturan, Sayfa: 81-87, İTÜ SDKM, İstanbul, 10-13 Temmuz 2010.
5. Akkaya, A. D. “ Rassal Tasarım Değişkenli Karesel Regresyon” , VII. İstatistik Günleri Sempozyumu, Ankara (2010).
6. Akkaya, A. D. and Yüçemen, M. S., “Magnitüd-Sıklık İlişkisi Parametrelerinin Robust Tahmini”, 1. Türkiye Deprem Mühendisliği ve Sismoloji Konferansı, Türkiye Deprem Mühendisliği Derneği, 9 sayfa, Ankara , 2011

e) Abstracts published in Conference Proceedings

International

1. Akkaya, A. D. ve Yüçemen, M. S., “Stochastic Modeling of Seismic Activity Along the North Anatolian Fault Zone”, Presented in the *XVIII th General Assembly of European Geophysical Society (EGS)*, Weisbaden, Germany (1993).
2. Akkaya, A. D. ve Yüçemen, M. S., “Seismic Hazard Prediction: Comparison of Different Space-time Random Process Models”, Presented in the *XX th General Assembly of European Geophysical Society (EGS)*, Hamburg, Germany (1995).
3. Akkaya, A. D. ve Yüçemen, M. S., “Prediction of Seismic Hazard Considering the Space-time Correlations”, Presented in the *VI th International Symposium on Natural and Man-Made Hazards (HAZARDS-96)*, Toronto, Canada (1996).

4. Dener, C., Kulaçođlu, H. ve Akkaya, A. D., “Mortality in Patients with Obstructing Colorectal Cancer”, Presented in the *International Conference on Applied Statistics in Medical Sciences*, METU, Ankara, Turkey (1997)
5. Akkaya, A. D. ve Yüccemen, M. S., “Random Field Models and Applications for the Estimation of Seismic Hazard”, Presented in the 7th *International Conference on Natural and Man-Made Hazards (HAZARDS-98)*, Chania, Greece (1998).
6. Yılmaz, Y. E. ve Akkaya, A. D., “Analysis of Variance and Linear Contrasts in Experimental Design with Symmetric Non-normal Error Distributions”, Presented in the *International Conference in Honour of Sir David Cox on the Occation of his 80th Birthday*, Neuchâtel, Switzerland (2004).
7. Çıđşar, C. ve Akkaya, A. D., “Goodness-of-fit Statistics Based on Censored Samples: Extreme-Value Distribution”, Presented in the *International Conference in Honour of Sir David Cox on the Occation of his 80th Birthday*, Neuchâtel, Switzerland (2004).
8. Akkaya A. D. Bayrak Türker, Ö., “Stochastic Autoregressive Models with Short-Tailed Symmetric Disturbances”, *8th World Congress in Probability and Statistics*, Koc University Ed. Caglar, M., and Ceylan, E. 247, (2012)

National

1. Yüccemen, M. S. Ve Akkaya, A. D., “Çok Boyutlu Rassal Fonksiyonlar ve Düzey Aşma Problemi”, Presented in the *YA/EM 1993-Yöneylem Araştırması ve Endüstri Mühendisliđi XV. Ulusal Kongresi, İstanbul* (1993).
2. Akkaya, A. D., “Kısa Kuyruklu Simetrik Dađılımlar ve Uygulamaları”. *5. İstatistik Günleri Sempozyumu*, p. 50, Antalya (2006).
3. Akkaya, A.D. ve Balcı, S., “Multiple Comparisons under Short-tailed Symmetric Distributions”. *5. İstatistik Kongresi ve Risk Ölçümleri ve Yükümlülük Toplantısı*, 52-53, Antalya (2007).
4. Akkaya, A. D. ve Ülgen, B. E., “ Gaussian Olmayan Hata Terimine Sahip Mikrodizin Verileri için Varyans Analizi”, VI. İstatistik Günleri Sempozyumu, s. 25, Samsun (2008).
5. Akkaya, A. D. “ Rassal Tasarım Deđişkenli Karesel Regresyon”, VII. İstatistik Günleri Sempozyumu, Ankara (2010).

Projects

1. Statistics Software Development Project. Supported by: METU Project No: AFP 91-01-09-01, Research Associate, 1991.
2. Estimation of Seismic Hazard by Statistical Methods. Supported by: METU Project No: AFP 93-03-03-02, Research Associate, 1993.

3. Statistical Characterization of Subsurface Properties at the US National Geotechnical Experimentation Sites. Supported by Federal Highway Administration and National Science Foundation, Princeton University, Princeton, USA, Research Associate, 1997.
4. Identification of the most Efficient Diagnostic Procedure in Cancer Screening by Using Stochastic Models. Supported by: METU Project No: AFP 98-01-09-01, Project Director, 1998.
5. One-way Classification Experimental Design Model with Generalized Secant Hyperbolic distribution. Supported by Scientific and Technical Research Council of Turkey, Project No: TBAG-2330 (103T033), Project Director, 2004.
6. Ranked set sampling. BAP-08-11-DPT2002K120510, Project Director, 2005.
7. Experimental Design with Short-tailed Symmetric Distribution, BAP-08-11-DPT2002K120510, Project Director, 2007.
8. Autoregressive Models with a Stochastic Design Variable: Application to Kızılırmak Basin, BAP-2008-01-09-01, Project Director, 2008.
9. Robust and efficient multiple comparison procedures, BAP-08-11-DPT2002K120510, Project Director, 2009.
10. FP 7 SEE-GRID eInfrastructure for regional eScience (SEE-GRID-SCI), RI-211338 , Research Associate, 1 MAY 2008 -1 APRIL 2010,
11. FP 7 SCI-BUS , Statistical Seismology Science Gateway, 283481, NA2 Coordinator and Research Associate, October 2011 –September 2014.

Technical Reports:

1. Akkaya, A. D. ve Yüçemen, M. S., “Stochastic Modeling of Earthquake Occurrences and Estimation of Seismic Hazard: A Random Field Approach”, *METU Earthquake Engineering Research Center, Report No. METU/EERC 96-02*, Ankara (1996).
2. Akkaya, A. D. and Yilmaz, Y. E., One-way Classification Experimental Design Model with Generalized Secant Hyperbolic Distribution. Scientific and Technical council of Turkey, Report No: TBAG-2330 (103T033), Ankara, 2004.

Graduate Theses Supervised:

Ms. Thesis

Mutluer, D., “The Usage of Logistic Regression Models in Determining Risk Factors of osteoporosis”, METU, 1999 (Co-supervisor).

Tezcan, F. B., “Statistical Evaluation of Symmetric and Asymmetric Loss Function Approach in Quality Control”, METU, 1999 (Co-supervisor).

Aslan, M., “ Applications of Estimation Techniques on Genetic and Other Types of Data”, METU, 2002 (Supervisor).

Erdoğan, E., “Analysis of Econometric Data Using Robust Methods”, METU, 2002 (Supervisor).

Yılmaz, Y. E., “Experimental Design with Short-tailed and Long-tailed Symmetric Error Distributions”, METU, 2004 (Supervisor).

Yılmaz, Y. E., “Bayesian Learning under Non-normality”, METU, 2004 (Co-supervisor).

Çığışar, C., “Goodness-of-fit tests based on censored samples”, METU, 2005 (Supervisor).

Balcı, S., “ Pairwise Multiple Comparisons Under Short-tailed Symmetric Distribution”, METU, 2007 (Supervisor).

Kocair, Ç., “ A Grid-based Seismic Hazard Analysis Application”, METU, 2010 (Co-supervisor).

Ömrüzun, F., “A Framework for Evaluating Field Based Academic Performances of Higher Education Institutions “, METU, 2011 (Co-supervisor).

Ph.D Thesis

Türker, Ö., “ Autoregressive Models: Statistical Inference and Applications”, METU, 2002 (Supervisor). Field

Sürücü, B., “Goodness-of-Fit Tests and Outlier Detection”, METU, 2003 (Co-supervisor).

Ülgen, E. “Robust Estimation and Hypothesis Testing Methods in Microarray Analysis”, METU (Supervisor).

Ph.D Thesis (in progress)

Balcı, S.,” METU (Dept. of Statistics).

Other academic activities:

International Conference Organization:

1. New Developments in Theory and Applications of Statistics (NEDETAS): An International Conference in Memory of Prof. Moti Lal Tiku, METU 2011.

National Conference Organization:

1. VII th Statistical Days Symposium, Ankara (2010).

Workshop Organization:

1. METU-ISU Biomathematics Research Workshop, June 6-7, 2010. Organizers: Prof. Dr. Zeki Kaya (Dept. of Biological Sciences, METU) and Prof. Dr. Ayşen D. Akkaya (Dept. of Statistics, METU).

Referee in National and International Journals:

- Anadolu Üniversitesi Sosyal Bilimler Dergisi
- Journal of Hydrological Processes
- Journal of Statistical Papers
- Acta Applicanda Mathematicae
- Applied Mathematical Letters
- Journal of Computational and Applied Mathematics
- Commun. Stat. Theory and Methods
- Mathematical Reviews
- Journal of the Korean Statistical Society
- FONDECYT : The Chilean government research funding agency- 2012 National Research Funding Competition (2011)
- Journal of Multivariate Analysis
- Journal of Applied Statistics

Panelist:

TUBİTAK

Courses taught in National and International Workshops:

- Akkaya, A. D., “Probabilistic Site Characterization at the National Geotechnical Experimentation Sites”, Workshop on Geotechnical Earthquake Engineering and Soil Dynamics, University of Washington, Seattle, USA (1998).
- Akkaya, A. D., “Robustness in Regression, Autoregression and Design of Experiments”, İstatistikte Yeni Gelişmeler Lisansüstü Yaz Okulu, ODTÜ, Ankara, Türkiye (2007).

Courses taught :

Undergraduate:

- Orientation in Statistics
- Principles of Statistics
- Introduction to Probability and Statistics I
- Introduction to Probability and Statistics II
- Principles of Statistics I
- Principles of Statistics II
- Numerical Methods
- Regression Analysis
- Optimal Statistical Decision Analysis
- Stochastic Processes
- Statistical Methods I
- Statistical Methods II
- Probability Theory
- Mathematical Statistics I
- Mathematical Statistics II
- Statistical Inference I
- Statistical Inference II

MSc.:

- Statistical Theory I
- Statistical Theory II
- Decision Theory
- Reliability Theory and Methods I
- Elements of Probability and Statistics
- Regression Theory
- Statistical Methods for Informatics

Ph.D.:

- Advanced Probability Theory I
- Advanced Probability Theory II

- Advanced Theory of Statistics I
- Advanced Theory of Statistics II
- Theory of Stationary Random Functions