Curriculum Vitae
Prof. Vilda Purutçuoğlu

Professor of Statistics

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PERSONAL DETAILS

Place of born	: İstanbul, Turkey
Nationality	: Turkish
Office	: Middle East Technical University(METU) Department of Statistics, Ankara, 06800, Turkey
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EDUCATION

- **B.Sc.**, Philosophy, Anadolu University, Turkey. (*September 2017- September 2020*).
- **Ph.D.**, Statistics, Lancaster University, UK. *Advisor*: Prof. Dr. Ernst Wit. *Thesis Title*: Bayesian methods for gene network analysis. (*October 2004-August 2007*).
- **M.Sc.**, Statistics, METU, Turkey. *Advisor*: Prof. Dr. Moti L. Tiku. *Thesis Title*: Unit root problems in time series analysis. (*September 2002-January 2004*)
- **Minor in B.Sc.**, Economics, METU, Turkey. *Degree Title*: Economic theory. (*February 2000-June 2002*).
- **B.Sc.**, Statistics, METU, Turkey. (*September 1998-June 2002*).

PROFESSIONAL ACTIVITIES

- *May 2026 - May 2029*, **Member of the Food Additives Commission**, Ministry of Agriculture and Forestry, Turkey.
- *January 2026 - December 2027*, **Awards Fund Committee Member**, IBS.
- *April 2026 - June 2026*, **Jury Member of Florence Nightingale Award**, IBS.
- *February 2025 - Continue*, **Head of Department of Statistics**, METU.

- *April 2025 - December 2025*, **Academic Advisor**, Huawei R&D Center, Turkey.
- *March 2024 - Continue*, **Horizontal Transfer Coordinator**, Department of Statistics, METU.
- *July 2023 - June 2024*, **Academic Advisor**, Huawei R& D Center, Turkey.
- *November 2022 - Continue*, **Editorial Board Members**, BMC Bioinformatics.
- *January 2022 - December 2026*, **Chair of Awards Fund Committee**, IBS.
- *June 2019 - Continue*, **Chair of Graduate Programme of Biomedical Engineering**, METU.
- *September 2020 - July 2025*, **External Examiner**, COMSATS University Islamabad, Pakistan.
- *June 2020 - December 2024*, **Associate Editor**, Biometrics.
- *June 2019 - June 2023*, **Country Representative**, Eastern Mediterranean Region of IBS (EMR-IBS).
- *2016 - 2021*, **Awards Fund Committee Member**, International Biometric Society (IBS).
- *2010-current*, **Advisory Board Member**, Journal of Biostatistics - Turkish Clinics.
- *November 2016 - March 2020*, **Biomolecular Engineering Track Representative**, Department of Biomedical Engineering, METU.
- *September 2017- October 2018*, **Faculty Executive Board Member**, Faculty of Arts and Sciences, METU.
- *2013-Continue*, **Internship Coordinator**, Department of Statistics, METU.
- *2008-Continue* : **Reviewer of Numerous Research Projects** supported by TÜBİTAK (The Turkish Scientific and Technological Research Council) and TÜSEB (Turkish Health Institutes) which are two leading state-funded research institutions in Turkey.
- *2009-2012*, **Seminar Coordinator**, Department of Statistics, METU.

SCHOLARSHIPS AND AWARDS

- *August 2024 - July 2025*, **Global Engagement Fellowship** (for collaboration with Prof. Dr. Jinghao Xue), University College London, London, UK.
- *July 2024*, **Invited Researcher**, Universita Della Svizzera Italiana, Lugano, Switzerland
- *2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2021, 2022, 2023, 2024* : **METU Best Academic Achievement Award** (The last award was given for 2024 academic performance.)
- *2015*: **Finalist of Sabri Ülker Science Award**, Sabri Ülker Food Research Foundation.
- *2015*: **TEÇEP Translation Book Honorable Mention Award**, Translated Book Edited by Prof. Dr. Zeki Kaya and co-authored with 22 academicians.

- *June 2012* : **Visitor Fellowship**, Department of Mathematics, Brunel University, UK.
- *2009, 2010*, **Invited Researcher**, Institute of Mathematics and Computing Science, Groningen University, The Netherlands.
- *2005-2008* : **Fellowships from Research Institutions in UK**: RSS (Royal Statistical Society), ESRC (Economic and Social Research Council), EPSRC (Engineering and Physical Sciences Research Council), BBSRC (Biotechnology and Biological Sciences Research Council), CRISM (Centre for Research in Statistical Methodology, Warwick University) Grants; Faculty Scholarships of Lancaster University (The fellowships cover all expenses for the participation of different conferences and training courses).
- *2005-2007* : **EPSRC Project Grant** (covers all expenses during Ph.D. including home tuition fees and subsistence), UK.
- *2004-2007* : **Overseas Ph.D. Fellowship**, Department of Mathematics and Statistics, Lancaster University, UK (The fellowship covers the difference between home and overseas tuition fees during Ph.D. in UK).
- *2004-2005* : **Ph.D. Fellowship**, Turkish Higher Education Council (The fellowship covers the home tuition fees and subsistence).

ACADEMIC POSTS

- *October 2018-current*, **Professor of Statistics**, Dept. of Statistics, METU.
- *December 2012-October 2018*, **Associate Professor**, Dept. of Statistics, METU.
- *February 2011-current*, **Affiliated Faculty Member**, Dept. of Biomedical Engineering, METU.
- *January 2011-2019*, **Affiliated Faculty Member**, Informatics Institute, METU.
- *November 2010-current*, **Affiliated Faculty Member**, Institute of Applied Mathematics, METU.
- *August 2010-December 2012*, **Assistant Professor**, Dept. of Statistics, METU.
- *June 2009-July 2010*, **Instructor**, Dept. of Statistics, METU.
- *August 2007-May 2009*, **Doctor Research Assistant**, Dept. of Statistics, METU.
- *July 2002-July 2007*, **Research Assistant**, Dept. of Statistics, METU.
- *February 2002-June 2002*, **Student Assistant**, Dept. of Economics, METU.
- *May 2000 - February 2001*, **Internships** in the Central Bank (Department of Marketing), State Planning Organization (Department of Economic Modelling and Strategic Researches), Turkish Statistical Institute (Department of National Accounts and Economic Indicators), Ankara.

RESEARCH INTERESTS

- Systems biology, high dimensional data, signal processing of biomedical data, neuroscience, explainable artificial intelligence, social statistics.

BOOKS

- **Purutçuoğlu, V.**and Yang, X. (2027). "Biomedical Data Science: A Focus on Signalling", CRC/Taylor and Francis ISBN: 978-1-041-34431-5.
- **Purutçuoğlu, V.**, Weber, G.W., and Farnoudkia, H. (May 2025). "Operations Research: Evolving Frontiers and Diverse Applications", CRC/Taylor and Francis ISBN: 9781032843049.
- **Purutçuoğlu, V.** and Ayyildiz, E. (January 2024)"Statistics in the Field of Bioinformatics (Biyoinformatik Alaninda Istatistik-in Turkish)" Nobel Publisher, 2nd Edition (with extentions). ISBN:978-605-320-008-6.
- **Purutçuoğlu, V.**, Weber, G.W. and Farnoudkia, H. (November, 2022) "Operations Research: New Paradigms and Emerging Applications, Series I", CRC/Taylor and Francis, ISBN: 978-1-032-34926-8.
- **Purutçuoğlu, V.** and Ayyıldız, E. (December, 2014) "Statistics in the Field of Bioinformatics (Biyoinformatik Alanında İstatistik-in Turkish)", Nobel Press. ISBN: 978-605-320-008-6.

PROJECTS

A. ONGOING PROJECTS

- **Principal investigator**, *September 2025-September 2027*, Research Universities' Project, METU-YÖK (The Council of Higher Education).
  Project title: A comparative analysis of the effect of women's presence in the labor market on family decisions in Turkish and British societies. *Project no*: 11662.
- **Principal investigator**, *January 2025-January 2027*, Scientific Research Project (BAP1), METU.
  Project title: Modeling the economic and sociological satisfaction of the Turkish family. *Project no*:11576.
- **Principal investigator**, *December 2024-December 2026*, Scientific and Technological Research Council (TUBITAK - 1505 Programme).
  Project title: Detecting outliers in user search data in application galleries. *Project no*: 5240032.

B. COMPLETED PROJECTS

1. **Principal investigator**,*May 2024-May 2025*, AdımODTÜ Undergraduate Research Project, METU.
   Project title: Foster family in Turkish society. *Project no*: E8.

2. **Principal investigator**, *September 2023- January 2025*, Scientific Research Project (BAP1), METU.
   Project title: Parameter estimation and model selection in network modeling for circular data. *Project no*: 11401.

3. **Co-investigator**, *January 2020-June 2022*, Scientific and Technological Research Council (TÜBİTAK - 1003 Programme).
   Project title: Development of hardware and software infrastructure for physiological human data for use in human-machine applications. *Project no:* 117E650.

4. **Independent Member, Confidential Health Research Project Monitoring/Advisory Board**, *January 2022-June 2022*, Collaborative work of Scientific and Technological Research Council (TÜBİTAK) and Ankara University (Served as an independent monitoring/advisory board member in confidential vaccine-related clinical research study. Study titles, protocol numbers, product-specific information and research details are withheld due to confidentiality obligations.)

5. **Independent Member, Confidential Health Research Project Monitoring/Advisory Board**, *April 2021-September 2021*, Collaborative work of Scientific and Technological Research Council (TÜBİTAK) and Selçuk University. (Served as an independent monitoring/advisory board member in a confidential clinical research studies in the field of infectious diseases. Contributed to the general ethical, methodological and procedural oversight of the study. Study title, protocol number, investigational product details and study-specific information are withheld due to confidentiality obligations.)

6. **Independent Member, Confidential Health Research Project Monitoring/Advisory Board**, *March 2021-November 2021*, Collaborative work of Scientific and Technological Research Council (TÜBİTAK) and METU. (Served as an independent monitoring/advisory board member in confidential clinical research studies in the field of infectious diseases. Study titles, protocol numbers, product-specific information and research details are withheld due to confidentiality obligations.)

7. **Tutorial Speaker**, *18-20 October 2021*, Scientific and Technological Research Council (TÜBİTAK - 2237-B Programme).
   Project title: Project training in engineering (MAPRE).

8. **Principal investigator**, *January 2020-January 2022*, Scientific Research Project (BAP1), METU.
   Project title: Approximate stochastic simulation algorithms in protein-protein interaction networks. *Project no*: BAP-10282.

9. **Secondary investigator**, *May 2016-November 2020*, European Community 7th Framework Programme (COST Programme).
   Project title: European network for statistical network science. *Project no:* CA15109.

10. **Tutorial Speaker**, *26-28 September 2019*, Scientific and Technological Research Council (TÜBİTAK - 2237-B Programme).
    Project title: Project training in engineering (MAPRE).

11. **Principal investigator**, *January 2017-December 2018*, Scientific Research Project (BAP1), METU.
Project title: Inference of the Gaussian graphical model and lasso regression via the modified maximum likelihood method. *Project no*: BAP-01-09-2017-002.

12. **Principal investigator**, *January 2017-December 2018*, Scientific Research Project (DAP1), METU.
Project title: Collection of genetic information, analysis and modeling of the cervical cancer with risk factors. *Project no*: BAP-08-11-2017-035.

13. **Principal investigator**, *January 2016-June 2017*, Scientific Research Project (BAP1), METU.
Project title: Alternative approaches, inference and copulas in deterministic modellings of complex biological systems. *Project no*: BAP-01-09-2016-002.

14. **Principal investigator**, *April 2015-April 2017*, Scientific and Technological Research Council (TÜBİTAK - 1001 Programme).
Project title: Application of copulas in inference of biological networks via Gaussian graphical models and parameter estimation. *Project no:* 114E636.

15. **Principal investigator**, *January 2014-January 2017*, METU Research and Development Project (AGEP Programme).
Project title: Simulation of biochemical systems via stochastic simulation algorithms and extensions of these methods by including impulses, *Project no*: BAP-08-11-2014-007.

16. **Principal investigator**, *April 2013-April 2015*, Scientific and Technological Research Council (TÜBİTAK-3501 Programme).
Project title: Stochastic inference of the model parameters for the biochemical systems via the particle filtering method. *Project no:* 112T772.

17. **Researcher**, *December 2012-July 2013*, Scientific and Technological Research Council (TÜBİTAK-1002 Programme).
Project title: The classification of histologic and pathologic subtypes of breast cancer with meta-analysis based in miRNA signatures. *Project no:* 112T679.

18. **Co-applicant for METU**, *September 2010 - March 2015*, European Community 7th Framework Programme, with Dr. Tolga Can (Dept. of Computer Engineering, METU) and Prof. Gerhard Wilhelm Weber (Institute of Applied Math, METU).
Project title: PATHOSYS - New Algorithms for Host Pathogen Systems Biology. *Project no*: 260429.

19. **Co-applicant**, *1-15 July 2010*, Scientific and Technological Research Council (TÜBİTAK-2229 Programme), with Dr. Barış Bayram and Prof. Mevlüde Gülbin Dural (Dept. of Electric an Electronic Engineering, METU).
Project title: Teaching promising high-school students for the "Physics Olympiad".

20. **Researcher**, *September 2009-September 2011*, Scientific Research Project (BAP), METU.
Project title: Identification of Turkish climate zones and development of precipitation forecast models by data mining methods. *Project no*: BAP-2008-01-09-02.

21. **Researcher**, *September 2005-August 2007*, Engineering and Physical Sciences Research Council, UK (EPSRC).
Project title: Stochastic modelling and statistical inference of gene regulatory pathways: integrating multiple sources of data. *Project no*: EP/C010620/1.

PUBLICATIONS IN JOURNALS

1. Karakaya, Ş. Ş., Bursalı, A. and **Purutçuoğlu, V.** (2026) "CRAN: Package cyclicwave (Cyclic Wave Analysis for Time-Series Clustering)".

2. Asanjan Farzin, M., **Purutçuoğlu, V.** and Wit, E. (2026). "CRAN: Package rgml0 (Random Graphical Model Estimation under L_0 Penalty)".

3. Karakaya, Ş. Ş. and **Purutçuoğlu, V.** (2026). "ECG arrhythmia classification using cyclic transformations and regression-based features". *Hacettepe Journal of Mathematics and Statistics*, 1-18 Doi:10.15672/hujms.1821412

4. Sarasir, F., **Purutçuoğlu, V.** and Bursalı, A. (2026). "Graph-based simulation and modeling of screentime data: a comparative study of Gaussian and random graphical approaches". *Gazi University Journal of Science Part A: Engineeringa and Innovation*, 13 (2), 522-541.

5. Özdemir, A.Z., Kaygusuz, M. A. and **Purutçuoğlu, V.** (2026). "E-values multiple testing for conformal prediction on social network construction". *Management Science and Information Technology*, 1-15 (Accepted).

6. Farzin Asanjan, M. and **Purutçuoğlu, V.** (2026). "Random graphical models with QUIC-enhanced inference: a methodological study". *Journal of Biostatistics- Turkish Clinics*, 18 (1), 1-13.

7. Kaygusuz, M. A., Göğebakan, M. and **Purutçuoğlu, V.** (2025). "Effect of bootstrapping in Gaussian mixture model". *Middle East Journal of Science*, 11 (2), 182-193.

8. Sarasir, F. and **Purutçuoğlu, V.** (2025). "The imputation of missingness in cyclic and non-cyclic Electromyography (EMG) signaling data". *Hacettepe Journal of Mathematics and Statistics*, 54 (5), 2036–2067.

9. Atanda, O., **Purutçuoğlu, V.**, Wit, E. and Weber, G.-W. (2025). "Detection of degree distribution for biological networksin Pearson Family and its approximation". *Afrika Matematika*, 36 (133), 1-12.

10. Mogharabin, A. and **Purutçuoğlu, V.** (2025). "A bayesian network model for family dynamics, linguistic influences and happiness in Turkey". *Gazi University Journal of Science Part A: Engineeringa and Innovation*, 12 (3), 918-933.

11. Farnoudkia, H. and **Purutçuoğlu, V.** (2025). "Inference of time series chain graphical model". *Journal of Dynamics and Games*, 12 (2), 183-195.

12. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2025). "Comparative study by adding bootstrapping stage in the construction of biological networks". *Journal of Dynamics and Games*, 12 (2), 118-133.

13. Kalaycı, B., **Purutçuoğlu, V.**, and Weber, G.W. (2024).“Optimal model description of finance and human factor indices”. *Central European Journal of Operations Research*, 33, 1-26.

14. Erkuş, E.C. and **Purutçuoğlu, V.** (2023) “A new collective anomaly detection approach using pitch frequency and dissimilarity: pitchy anomaly detection (PAD))”. *Journal of Computational Science*, 72, 102084, 1-31.

15. Demirbüken, S. and **Purutçuoğlu, V.** (2022) “Extension of Leap Condition in Approximate Stochastic Simulation Algorithms of Biological Networks”. *Turkish Journal of Mathematics and Computer Science*, 14 (2), 1-10.

16. Erkuş, E.C. and **Purutçuoğlu, V.** (2021) “Outlier detection and quasi-periodicity optimization algorithm: Frequency domain based outlier detection (FOD)”. *European Journal of Operational Research*, 291, 560-574.

17. Farnoudkia, H. and **Purutçuoğlu, V.** (2021) “Vine copula graphical models in the construction of biological networks”. *Hacettepe Journal of Mathematics and Statistics*, 50 (4), 1172–184.

18. Bülbül, G. B. and **Purutçuoğlu, V.** (2021) “Novel model selection criteria for LMARS: MARS designed for biological networks”. *Journal of Statistical Computation and Simulation*, 91 (9), 174–1761.

19. Farnoudkia, H. and **Purutçuoğlu, V.** (2020) “Application of r-vine copula method in Istanbul stock market data: A case study for the construction sector”. *Journal of Turkish Operations Management*, 4 (2), 509-518.

20. Ağraz, M. and **Purutçuoğlu, V.** (2020) “Long-tailed graphical model and frequentist inference of the model parameters for biological networks”. *Journal of Statistical Computation and Simulation*, 90 (9), 1591-1605.

21. **Purutçuoğlu, V.** and Farnoudkia, H. (2019) “Copula Gaussian graphical modelling of biological networks and Bayesian inference of model parameters”, *Scientia Iranica*, doi: 10.24200/sci.2019.5071.1076, 26 (4), 2495-2505.

22. Erkuş, E C., **Purutçuoğlu, V.**, Purutçuoğlu, E. (2019) “Detection of abnormalities in heart rate using multiple Fourier transforms”, *International Journal of Environmental Science and Technology*, https://doi.org/10.1007/s13762-019-02252-3, 16, 5237–5242.

23. Bülbül, G. B., **Purutçuoğlu, V.**, Purutçuoğlu, E. (2019) “Novel model selection criteria on sparse biological networks”, *International Journal of Environmental Science and Technology*, https://doi.org/10.1007/s13762-019-02206-9, 16, 535–5364.

24. Ağraz, M. and **Purutçuoğlu, V.** (2019) “Extended lasso-type MARS (LMARS) model in the description of biological network”, *Journal of Statistical Computation and Simulation*, doi: 10.1080/00949655.2018.15314, 89 (1), 1-14.

25. Bahçivancı, B., **Purutçuoğlu, V.**, Purutçuoğlu, E., Ürün, Y. (2018) “ Estimation of gynecological cancer networks via target proteins”, *Journal of Multidisciplinary Engineering Science and Technology*, 5 (12), 9296-9302.

26. Ayyıldız, E. and **Purutçuoğlu, V.** (2018) "Modeling of various biological networks via LCMARS", *Journal of Computational Science*, 28, 148-154.

27. Ayyıldız, E. and **Purutçuoğlu, V.** (2018)"Is it necessary to apply the outlier detection for protein-protein interaction data?", *Journal of Biostatistics-Turkish Clinics*, 1-17.

28. Ayyıldız, E., **Purutçuoğlu, V.** and Weber, G.W. (2018) "Loop-based conic multivariate adaptive regression splines is a novel method for advanced construction of complex biological networks", *European Journal of Operational Research*, doi: 10.1016/j.ejor.2017.12.011, 270, 852-861.

29. Altıntan, D., **Purutçuoğlu, V.** and Uğur, Ö. (2018) "Impulsive expressions in stochastic simulation algorithms", *International Journal of Computational Methods*, doi: 10.1142/S021987621750075X, 15 (1), 750075.1-16.

30. Altıntan, D. and **Purutçuoğlu, V.**. (2018) "Exact stochastic simulation algorithms and impulses in biological systems", *International Journal of Computational and Experimental Science and Engineering*, 4 (2), 41-47.

31. Varol, D., **Purutçuoğlu, V.** and Yılmaz, R. (2017) "Whole genome analysis of the heat stress response in commercial baker's yeast (Saccharomyces cerevisiae) with comparative statistical approaches", *Gene and Genomics*, doi: 10.1007/s13258-017-0616-6, 1-14.

32. Dokuzoğlu, D. and **Purutçuoğlu, V.** (2017) "Comprehensive analyses of Gaussian graphical model under different biological networks", *Acta Physica Polonica, Series A*, doi: 10.12693/APhys PolA.132. 1106, 132, 1106-1111.

33. **Purutçuoğlu, V.** and Farnoudkia, H. (2017) "Gibbs sampling in inference of copula Gaussian graphical model adapted to biological networks", *Acta Physica Polonica, Series A*, doi: 10.12693/ APhysPolA.132.1112, 132, 1112-1117.

34. **Purutçuoğlu, V.** and Ayyıldız, E. (2017) "Mathematical modeling of gene networks (in Turkish)", *Journal of Biostatistics-Turkish Clinics*, doi: 10.5336/biostatic.2017-55474, 1-13.

35. Akal, T., **Purutçuoğlu, V.** and Weber, G.-W. (2017) "Robust background normalization method for one-channel microarrays", *Turkish Journal of Biochemistry*, doi: 10.1515/tjb-2016-0231, 42 (2), 1-11.

36. **Purutçuoğlu, V.**, Ayyıldız, E. and Wit, E. (2017) "Comparison of two inference approaches in Gaussian graphical models", *Turkish Journal of Biochemistry*, 42 (2), 1-20.

37. **Purutçuoğlu, V.**, Ağraz, M. and Wit, E. (2017) "Bernstein approximations in glasso-based estimation of biological networks", *The Canadian Journal of Statistics*, doi: 10.1002/cjs11309, 45 (1), 62-76.

38. Tuncer, G. and **Purutçuoğlu, V.** (2017) "Application of impulsive deterministic simulation of biochemical networks via simulation tools", *Proceedings of the Jangjeon Mathematical Society (PJMS)*, 20 (1), 105-119.

39. Ayyıldız, E., Ağraz, M. and **Purutçuoğlu, V.** (2017) "MARS as the alternative approach of Gaussian graphical model for biochemical networks", *Journal of Applied Statistics*, 44 (16), 2858–2876.

40. Ağraz, M. and **Purutçuoğlu, V.** (2016) "Different types of Bernstein operators in inference of Gaussian graphical model", *Cogent Mathematics*, 3, 1154706.1-11.

41. Tuncer, G. and **Purutçuoğlu, V.** (2015) "Comparative assessment of simulation tools for biochemical networks", *American Review of Mathematics and Statistics*, doi: 10.15640/arms.v3n2a9, 3 (2), 69-82.

42. İyigün, C., Türkeş, M., Batmaz, İ., Yozgatlıgil, C., **Purutçuoğlu, V.**, Koç, E.K., Öztürk, M. (2013) "Clustering current climate regions of Turkey by using a multivariate statistical method", *Theoretical and Applied Climatology*, doi: 10.1007/s00704-012-0823-7, 1-15.

43. **Purutçuoğlu, V.** and Wit, E. (2012) "Estimating network kinetics of the MAPK/ERK pathway using biochemical data", *Mathematical Problems in Engineering*, doi:10.1155/2012/ 752631, 1-34.

44. Ayyıldız, E., **Purutçuoğlu, V.**, and Wit, E. (2012) "A short note on resolving singularity problems in covariance matrices", *International Journal of Statistics and Probability*, doi:10.5539/ ijsp.v1n2p113, 1 (2), 113-118.

45. **Purutçuoğlu, V.** (2012) "Inference of the stochastic MAPK pathway by modified diffusion bridge method", *Central European Journal of Operations Research*, doi: 10.1007/s10100-012-0237-8, 1-15.

46. **Purutçuoğlu, V.** (2012) "Robust gene expression index", *Mathematical Problems in Engineering*, doi: 10.1155/2011/182758, 1-12.

47. **Purutçuoğlu, V.** and Karagülle, S. (2011) "Stukel's extended logistic regression analysis with R", *Journal of Biostatistics-Turkish Clinics*, 3 (1), 49-56.

48. Çuhacı, G. and **Purutçuoğlu, V.** (2011) "Review of the six-sigma methodology and its case studies", *Selçuk Journal of Applied Mathematics*, 12 (1), 95-108.

49. Kartal, E., Fahmi, F. M., İyigün C., Türkeş, M., Yozgatlıgil, C., **Purutçuoğlu, V.**, Batmaz, İ., and Köksal, G. (2011) "Identifying climate zones of Turkey by hierarchical clustering method (in Turkish)", *Journal of Statistical Research*, 8 (1), 13-25.

50. **Purutçuoğlu, V.** (2010) "An overview to stochastic simulation algorithms for biochemical systems (in Turkish)", *Journal of Statistical Research*, 7 (1), 70-82.

51. **Purutçuoğlu, V.** and Wit, E. (2008) "Bayesian inference for the MAPK/ERK pathway by considering the dependency of the kinetic parameters", *Bayesian Analysis*, doi: 10.1214/08-BA332, 3 (4), 851-886.

52. **Purutçuoğlu, V.** and Wit, E. (2008) "Bayesian inference of the complex MAPK pathway under structural dependency", *Journal of Statistical Research*, 6 (1), 1-17.

53. **Purutçuoğlu, V.** and Wit, E. (2007) "FGX: a frequentist gene expression index for Affymetrix arrays", *Biostatistics*, doi: 10.1093/biostatistics/kx1020, 8 (2), 433-437.

54. **Purutçuoğlu, V.** and Wit, E. (2006) "Exact and Approximate Stochastic Simulations of the MAPK Pathway and Comparisons of Simulations' Results", *Journal of Integrative Bioinformatics*, doi:10.2390/biecoll-jib-2006-38, 3, 1-13.

55. **Purutçuoğlu, V.** and Wit, E. (2005). Discussion on the paper by Copas and Eguchi, *Journal of the Royal Statistical Society, Series B*, doi: 1369-7412/05/67459, 67, Part 4, 507-508.

CHAPTERS IN BOOKS

1. Karakaya, Ş. Ş and **Purutçuoğlu, V.** (2027) "ECG-based arrhythmia classification using cyclic and non-cyclic representations", 18-42. Chapter in: *Biomedical Data Science: A Focus on Signalling*. Editors: V. Purutçuoğlu and X. Yang, *CRC/Taylor and Francis*.

2. Somuncuoğlu, A. N. and **Purutçuoğlu, V.** (2027) "Explainable AI approaches in biomedical signals: a case study with Pima Indians Diabetes dataset", 194-218. Chapter in: *Biomedical Data Science: A Focus on Signalling*. Editors: V. Purutçuoğlu and X. Yang, *CRC/Taylor and Francis*.

3. Karakaya, Ş. Ş, **Purutçuoğlu, V.**, Bursalı, A. and Erkuş, E.C. (2026) "Revealing cyclic dynamics in electricity consumption: a hybrid feature-based clustering framework", 415-425. Chapter in: *Optimization and Data Science in Industrial Engineering*. Editors: Z. Molamohamadi, E. B. Tirkolaee, A. Mirzazadeh, G. W. Weber, *Springer Nature*.

4. Atar, G., **Purutçuoğlu, V.**, Erkuş, E.C. and Bursalı, A. (2026) "Robust modeling of global temperature anomalies (1850-2024)", 440-455. Chapter in: *Optimization and Data Science in Industrial Engineering*. Editors: Z. Molamohamadi, E. B. Tirkolaee, A. Mirzazadeh, G. W. Weber, *Springer Nature*.

5. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2026). "Optimal alternative multiple testing procedure for imputation of single cell RNA sequence data", 207-216. Chapter in: *Nonlinear Dynamical Control, Computer Simulation and Optimization Systems: Theory and Applications*. Editors: D. Baleanu, N. Özdemir, Y. Karaca, M. N. Janardnahan, F. Evirgen and İ. Küçükkoç, *World Scientific Publishing*.

6. Doğan-Dar, E. and **Purutçuoğlu, V.** (2025) "Construction of a circular graphical network via an RNA-seq data set", 182-203. Chapter in: *Operations Research: Evolving Frontiers and Diverse Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.

7. Sarasir, F. and **Purutçuoğlu, V.** (2025) "Imputation of missing value in EMG signaling data", 204-231. Chapter in: *Operations Research: Evolving Frontiers and Diverse Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.

8. Atar, G. and **Purutçuoğlu, V.** (2025) "Statistical modeling of social data: a case study from TAYA 2016 survey", 292- 322. Chapter in: *Operations Research: Evolving Frontiers and Diverse Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.

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2. Arayit, N., Özdemir, A.Z., Kılıç, M. and **Purutçuoğlu, V.** "Maternal employment, parenting practices, and child well-being: a comparative analysis of Turkish and British Household Survey Data". *Proceeding of the 9th International Black Sea Modern Scientific Research Congress*, Düzce, Turkey (Accepted).

3. Toparlak, S., **Purutçuoğlu, V.** and Somuncuoğlu, A. N. (2026) "New robust metrics for the coefficient stability index in OptiLIME explanations", *Proceeding of the 6th International Artificial Intelligence and Data Science Congress (ICADA 2026)*, Nevşehir, Turkey.

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B. SELECTED PUBLISHED ABSTRACTS

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7. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2023) "Conditional randomization test for average treatment effect with survival forest", *Proceeding of 11th International Conference on Computational and Experimental Science and Engineering (ICCESEN 2023)*, Antalya, Turkey.

8. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2023) "Conditional randomization test for average treatment effect with survival forest", *Proceeding of 12th International Conference of the International Biometric Society's Eastern Mediterranean Region (EMR-IBS 2023)*, İzmir, Turkey.

9. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2023) "Deep neural networks for average treatment effect on biological networks", *Proceeding of 12th International Conference of the International Biometric Society's Eastern Mediterranean Region (EMR-IBS 2023)*, İzmir, Turkey.

10. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2022) "Effect of bootstrapping in sparse biological data and model selection via likelihood ratio test", *Proceeding of 24th International Conference on Computational Statistics (COMPSTAT 2022)*, Bologna, Italy.

11. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2022) "Computationally efficient model selection procedure for random forest causal model", *Proceeding of 9th International Congress on Fundamental and Applied Science (ICFAS 2022)*, İstanbul, Turkey.

12. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2021) "A conditional randomization test for generalized additive models with bootstrap methods", *Proceeding of 4th International Conference on Econometrics and Statistics (EcoSta 2021)*, Virtual Congress, Hong Kong.

13. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2021) "Deep neural networks for faster nonparametric regression", *Proceeding of 10th World Congress in Probability and Statistics*, Virtual Congress, South Korea.

14. Doğan - Dar, E. and **Purutçuoğlu, V.** (2020) "Construction of circular-circular graphical network via simulated and real data", *COSTNET Statistical Network Science Virtual Conference*, Munih, Germany.

15. Ayyıldız, E. and **Purutçuoğlu, V.** (2019) "A new steady-state modeling approach for protein-protein interaction networks",*Proceeding of the 32nd Edition of the European Meeting of Statisticians (EMS 2019)*, Palermo, Italy.

16. Erkuş, E. C. and **Purutçuoğlu, V.** (2019) "Detection of hidden patterns in time series data via multiple-time FOD method", *Proceeding of the 30th European Conference on Operational Research (EURO 2019)*, Dublin, Ireland.

17. **Purutçuoğlu, V.** and Ağraz M. (2017)"Steady-state modeling of the biological network via long-tailed symmetric distribution", *Proceeding of International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM 2017)*, Kuşadası, Turkey.

18. **Purutçuoğlu, V.** and Altıntan, D. (2016) "Exact stochastic simulation algorithms under different scenarios of biological systems", *Proceeding of the 2nd Researchers-Statisticians and Young Statisticians Congress (IRSYSC)*, Ankara, Turkey.

19. Tuncer, G. and **Purutçuoğlu, V.** (2015) " Bifurcation analyses in biochemical networks via simulation tools", *Proceeding of the 2nd International Conference on Computational and Experimental Science and Engineering*, Antalya, Turkey.

20. **Purutçuoğlu, V.** and Tiku, M. L. (2009) "Testing unit root and comparison of estimates", *Proceeding of the 14th International Congress on Computational and Applied Mathematics*, Antalya, Turkey.

21. **Purutçuoğlu, V.** and Wit, E. (2009) "Rao-blackwellized estimates for the multivariate Bayesian inference", *Proceeding of the International Conference of Mathematical Sciences*, İstanbul, Turkey.

22. **Purutçuoğlu, V.** and Wit, E. (2008) "Variational approximation in inference of the kinetic parameters of the MAPK/ERK pathway", *Proceeding of CRISM Workshop: Bayesian Inference for high-dimensional data*, Warwick, UK.

23. **Purutçuoğlu, V.** and Wit, E. (2007) "A new method in approximate stochastic simulations and application in real biochemical systems", *Proceeding of the 17th International Workshop on Mathematical and Statistical Aspects of Molecular Biology*, Manchester, UK.

TECHNICAL REPORTS AND OTHERS

- Yazıcı, C., **Purutçuoğlu, V.**, Yozgatlıgil, C., Bayramoğlu, K., İyigün, C., and Batmaz, İ. "Homogeneity analysis of Turkish climate data", 2012, No: METU-STAT-Technical Report-2012-001.
- Asar, Ö., Kartal, E., Aslan, S., Öztürk, M. Z., Yozgatlıgil, C., Çınar, İ., Batmaz, İ., **Purutçuoğlu, V.**, İyigün, C., Fahmi, F., Köksal, G., Türkeş, M., and Tatlı, H. "Handling and analysis of Turkish precipitation data for the period 1950-2006 using descriptive data mining techniques (in Turkish)", 2011, No: METU-STAT-Technical Report-2011-1.

TALKS

Invited Talks

1. "European cooperation for statistics of network data,", Turkey representative in the fourth kick-off meeting of COST project COSTNET, Bilbao, Spain, 9-11 October, 2019.
2. "Sparse modeling and inference of networks,", Polish Bioinformatics Society Annual Symposium, Cracow, Poland, 19-21 September, 2019.
3. "European cooperation for statistics of network data,", Turkey representative in the second kick-off meeting of COST project COSTNET, Palma De Mallorca, Spain, 27 October, 2017.
4. "Protein-protein interaction networks' data", Institute of Applied Mathematics, METU, Ankara, Turkey, 13 December 2016.
5. "European cooperation for statistics of network data,", Turkey representative in the first kick-off meeting of COST project COSTNET, Ribno, Slovenia, 20 September, 2016.
6. "European cooperation for statistics of network data,", Turkey representative in the first management committee meeting of COST project COSTNET, Brussels, Belgium, 11 May 2016.
7. "Inference of the network via Gaussian graphical models", METU-group co-representative in the fifth kick-off meeting of the joint EU-7 project PathoSys, SysPatho Workshop: System Biology ad Medicine, Ecole Supéror de Lyon, Lyon, France, 20 September 2013.
8. "Estimating the network by different inference methods", METU-group co-representative in the third kick-off meeting of the joint EU-7 project PathoSys, SysPatho Workshop: System Biology ad Medicine, St. Petersburg, Russia, 11 September 2012.
9. "Dynamic modelling of biochemical system via graphical models", METU-group representative in the second kick-off meeting of the joint EU-7 project PathoSys, Bahçeşehir University, İstanbul, 16 February 2012.
10. "Inference of a complex network via stochastic and deterministic approaches", Institute of Applied Mathematics, METU, Ankara, Turkey, 25 December 2012.
11. "Diffusion bridge modelling of stochastic networks", *Workshop: Statistics for Biological Networks*, Groningen, The Netherlands, 9 September 2011.

12. "Inference of the JAK-STAT gene network via graphical models", *the 23rd International Conference on Systems Research, Informatics and Cybernetics* (IIAS 2011), Baden, Germany, 3 August 2011.

13. "Modelling of the biological networks by probabilistic approaches", *invited short course*, *International Symposium on Innovations in Intelligent Systems and Applications* (INISTA 2011), İstanbul, Turkey, 17 June 2011.

14. "Network structure", *invited short course*, *6th International Symposium on Health, Informatics and Bioinformatics* (HIBIT'11), İzmir, Turkey, 2 May 2011.

15. "Topics in statistical bioinformatics", Informatics Institute, METU, Ankara, Turkey, 15 April 2011.

16. "Statistical approaches for biological networks: Simulation, modeling, and inference", Department of Biomedical Engineering, METU, Ankara, Turkey, 8 April 2011.

17. "Network inference", METU-group representative in the kick-off meeting of the joint EU-7 project PathoSys, BioQuant Center, University of Heidelberg, Germany, 29 October 2010.

18. "Inference in single cell dynamics", Institute of Applied Mathematics, METU, Ankara, Turkey, 24 December 2010.

19. "Statistics for biological networks", *invited short course* with Prof. Dr. Ernst Wit and Dr. Veronica Vinciotti, *25th International Biometric Conference* (IBC2010), Florianópolis, Brazil, 5 December 2010.

20. "Statistical methods in system biology", Department of Biology, METU, Ankara, Turkey, 1 May 2008.

21. "Variational approximation in inference of the kinetic parameters of the MAPK/ERK pathway", *CRISM Workshop: Bayesian Inference for High-dimensional Data*, Warwick, UK, 14 April 2008.

22. "Analysis of the MAPK pathway: from simulation to inference", Bioinformatic Research Center (BRC), University of Glasgow, Glasgow, UK, 18 May 2007.

Seminar Talks

1. "Modeling and inference of sparse networks: cases in biological datasets", Department of Industrial Engineering, TOBB, Ankara, 22 January 2020.

2. "Sparse modeling and inference of networks", Department of Statistics, METU, Ankara, 3 January 2019.

3. "A Few Project Topics in Bioinformatics", Department of Statistics, METU, Ankara, 5 December 2013.

4. "Academic Development Programme (AGEP)-METU", METU Northern Cyprus Campus, Güzelyurt, Cyprus, 31 March 2012.

5. "Stochastic simulation of biochemical networks", Institute of Applied Mathematics, METU, Ankara, Turkey, 26 May 2011.

6. "Brief overview of statistical bionformatics", Department of Statistics, METU, Ankara, Turkey, 29 April 2010.

7. "Statistical methods in the analysis of complex gene networks", Department of Statistics, METU, Ankara, Turkey, 3 January 2008.

8. "Two case studies in bioinformatics", Department of Mathematics and Statistics, Lancaster University, Lancaster, UK, 26 October 2006.

9. "FGX: a Frequentist gene expression index for oligonucleotides", Department of Statistics, University of Glasgow, Glasgow, UK, 12 April 2005.

10. "Unit root problems in time series", Department of Statistics, METU, Ankara, Turkey, 23 December 2003.

TEACHING EXPERIENCE

All of the following courses were offered at the Middle East Technical University, where the language of instruction is English.

- *2025-2026* : Artificial Intelligence and Statistics (Stat 440), Introduction to Probability and Statistics II (Stat 202), Multivariate Analysis (Stat 467), Nonparametric Statistics (Stat 460), Statistical Decision Analysis (Stat 472), Statistical Bioinformatics (STAT 529-MSc Course)

- *2024-2025* : Multivariate Analysis (Stat 467), Research Methods and Ethics in Statistics (Stat 510), Stochastic Processes (Stat 376), Statistical Decision Analysis (Stat 472)

- *2023-2024* : Multivariate Analysis (Stat 467), Research Methods and Ethics in Statistics (Stat 510), Stochastic Processes (Stat 376), Undergraduate Research (Stat 499), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)

- *2022-2023* : Multivariate Analysis (Stat 467), Research Methods and Ethics in Statistics (Stat 510), Stochastic Processes (Stat 376), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)

- *2021-2022* : Probability II (Stat 204), Interpretation of Data I (Stat 614 - PhD Course)

- *2020-2021* : Probability I-II (Stat 203 and Stat 204), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)

- *2019-2020* : Probability I-II (Stat 203 and Stat 204), Statistical Decision Analysis (Stat 472), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)

- *2018-2019* : Principle of Statistics I-II (Stat 155 and Stat 156), Statistical Bioinformatics (Stat 730 - MSc Course), New Horizons in Statistics (Stat 493).

- *2017-2018* : Principle of Statistics I-II (Stat 155 and Stat 156), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course), Nonparametric Statistics (Stat 460).

- *2016-2017* : Statistics for Bioinformatics (Stat 730-MSc/PhD Course) Multivariate Analysis I - II (Stat 465 and Stat 466), Principle of Statistics I - II (Stat 155 and Stat 156).
- *2015-2016* : Statistics for Bioinformatics (Stat 730-MSc/PhD Course) Multivariate Analysis I - II (Stat 465 and Stat 466), Computational Statistics (Stat 361).
- *2014-2015* : Statistics for Bioinformatics (Stat 730-MSc/PhD Course) Nonparametric Statistics (Stat 460), Applications in Statistics (Stat 495).
- *2013-2014* : Statistics for Engineers I (Stat 221), Elements of Probability and Statistics (IAM 530 - MSc Course)
- *2012-2013* : Multivariate Analysis I - II (Stat 465 and Stat 466), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)
- *2011-2012* : Multivariate Analysis I - II (Stat 465 and Stat 466), Probability Theory (Stat 391), Nonparametric Statistics (Stat 460), Statistical Methods for Informatics (Bin 502)
- *2010-2011* : Multivariate Analysis I - II (Stat 465 and Stat 466), Nonparametric Statistics (Stat 460), Decision Theory and Bayesian Analysis (Stat 565 - MSc Course)
- *2009-2010* : Multivariate Analysis I - II (Stat 465 and Stat 466), Undergraduate Research (Stat 499), Introduction to Probability and Statistics I (Stat 201), Statistics for Engineers I (Stat 221)
- *2008-2009* : Probability I - II (Stat 153 and Stat 154), Introduction to Probability and Statistics I - II (Stat 201 and Stat 202)
- *2007-2008* : Probability I - II (Stat 153 and Stat 154), Introduction to Probability and Statistics I - II (Stat 201 and Stat 202)
- *2003-2004* : Operational Research (Stat 496), Probability (Stat 253) (as a teaching assist.)
- *2002-2003* : Operational Research (Stat 496), Probability (Stat 253) (as a teaching assist.)
- *2001-2002* (*Spring Semester*): Statistics for Economists II (Econ 206) (as a student assist.)

POSTGRADUATE SUPERVISION AND THESIS TITLES

A. DOCTORATE

- **2025-Continue**. Şule Şevval Karakaya, "Explainable AI for clinical decision support on mixed-type large-scale healthcare data".
- **2025-Continue**. Fatemeh Sarasir, "Multidimensional modeling of biomedical data in explainable artificial intelligence approaches".
- **2023-Continue**. Gizem Atar, "Network modeling of social survey data".
- **2023-Continue**. Nurgül Gökgöz, "Feedback systems with machine learning and control strategies applied to biological systems".

- **2022-2026**. Mahdieh Farzin Asanjan, "Statistical network modeling of microbiomes datasets".
- **2019-2026**. Abdullah Nuri Somuncuoğlu, "Development of explainable artificial intelligence model for biomedical survival analysis".
- **2017-2023**. Betül Kalaycı, "Modeling mutual interaction of finance and human factor and various sorts of indices".
- **2017-2023**. Ekin Can Erkuş, "Collective anomaly detection in time series using pitch frequency and dissimilarity features".
- **2016-2023**. Elif Doğan Dar, "A non-parametric circular network construction via simulations and a hidden markov model for the HIV-1 protease cleavage site detections".
- **2014-2020**. Hajar Farnoudkia, "Bayesian inference of the Gaussian graphical model for biochemical networks".
- **2013-2019**. Ezgi Ayyıldız, "Inference of large-scale networks via statistical approaches".
- **2011-2017**. Melih Ağraz, "Different types of modellings and the inference of model parameters for complex biological systems".

B. MASTER

- **2025-Continue**. Ayşe Nur Sarı, "Modeling and evaluating the impact of economic initiatives using real-world data".
- **2025-Continue**. Elif Naz Fidancı, "Statical modeling of molecular data".
- **2025-Continue**. Aybüke Zeliha Özdemir, "Statistical modeling of large-scale national survey data".
- **2024-Continue**. Simay Toparlak, "Nonlinear modeling within XAI".
- **2023-2026**. Şule Şevval Karakaya, "Classification of ECG signal under different representations to diagnose cardiac arrythmias".
- **2022-2025**. Buse Bakış, "Network modeling to describe children status in Turkish family".
- **2021-2024**. Fatemeh Sarasir, "The imputation of missingness in cyclic and non-cyclic electromyography signal data".
- **2019-2023**. Gizem Atar, "Application of statistical methods in the analyses of foster family".
- **2018-2021**. Saliha Yıldırım Demirbüken, "Approximate stochastic simulation algorithm based on nonparametric goodness-of-fit test". ,
- **2014-2019**. Barış Su Karakelle, "Analyses and modelling of ovarian cancer microarray data".
- **2016-2019**. Başak Bahçivancı, "Biological pathway construction via continuous and categorical data".

- **2017-2019**. Gül Bahar Bülbül, "Model selection criteria in the construction of protein-protein interaction networks".
- **2014-2017**. Deniz Seçilmiş,"Deterministic modelling and inference of biochemical networks".
- **2013-2016**. Damla Dokuzoğlu, "Application of copulas in graphical models for inference of biological systems".
- **2011-2016**. Müge Yazıcı, "Stochastic simulations of biological networks under impulses".
- **2013-2015**. Selim Yayla (Co-advisor), "Regulatory networks studied by ellipsoidal calculus".
- **2012-2015**. Gökçe Tuncer, "Comparative analysis in deterministic simulation of biological systems".
- **2011-2014**. Bilge Sürün (Co-advisor), "Analysis of motifs in microRNA-transcription factor gene regulatory networks".
- **2011-2014**. Omolola Odunsi, "Detection of the distribution and parameter estimation for the departing connectivity in biological networks".
- **2011-2014**. Duygu Varol, "Comparative statistical microarray analysis of yeast data under heat shock stress".
- **2011-2013**. Ezgi Ayyıldız, "Gaussian graphical approaches in estimation of biological systems".
- **2010-2013**. Tülay Akal, "Gene expression indices for single-channel microarrays".

PERSONAL INTERESTS

- Reading, particularly, philosophical, historical and fiction books
- Playing "kanun" (Turkish musical instrument)

REFERENCES

- Prof. Dr. Ernst Wit: Institute of Mathematics and Computing Science, Institute of Computational Science, Universita della Svizzera Italiana (USI), 6900, Lugano, Switzerland. Email: `ernst.jan.camiel.wit@usi.ch`
- Prof. Dr. Gerhard Wilhelm Weber: Faculty of Engineering Management, Poznan University of Technology, 60-965, Poznan, Poland. Email: `gerhard.weber@put.poznan.pl`