

Curriculum Vitae

Prof. Vilda Purutcuoğlu

Professor of Statistics

Updated: 5 April, 2025

PERSONAL DETAILS

Office : Middle East Technical University (METU),
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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 (By completing a 2 (+1) year programme in 1 and 1/2 years with high honor cumulative).*
- **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

- *February 2025 - Continue, Head of Department of Statistics, METU.*
- *April 2025 - December 2025, Academic Advisor, Huawei R& D Center, Turkey.*
- *July 2023 - June 2024, Academic Advisor, Huawei R& D Center, Turkey.*
- *November 2022 - Continue, Editorial Board Members, BMC Bioinformatics.*
- *January 2022 - December 2027, Chair of Awards Fund Committee, International Biometric Society (IBS).*

- *June 2019 - June 2025, Chair of Graduate Programme of Biomedical Engineering, METU.*
- *September 2020 - July 2025, External Examiner, COMSATS University Islamabad, Pakistan.*
- *March 2024 - Continue, Horizontal Transfer Coordinator, Department of Statistics, METU.*
- *June 2020 - December 2024, Associate Editor, Biometrics.*
- *June 2019 - June 2023, Country Representative, Eastern Mediterranean Region of the International Biometric Society (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-current, Internship Coordinator, Department of Statistics, METU.*
- *2009-2012, Seminar Coordinator, Department of Statistics, METU.*

SCHOLARSHIPS AND AWARDS

- *August 2024 - July 2025, Global Engagement Fellowship, 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 : Academic Performance Award, METU.*
- *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.*
- *2009, 2010 : Visitor Fellowship, 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

- Bioinformatics, systems biology, high dimensional data, neuroscience, social statistics.

BOOKS

- **Purutçuoğlu, V.** and Yang, X. (2025). “Major Applications in Biomedical Engineering”, CRC/Taylor and Francis (In progress).
- **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 Alanında İstatistik-in Turkish)” Nobel Publisher, 2nd Edition. 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.

COMPLETED PROJECTS

A. ONGOING PROJECTS

- **Principal investigator**, *January 2025-December 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 (TÜBİTAK - 1505 Programme). Project title: Detecting outliers in user search data in application galleries. Project no: 5240032.
- **Principal investigator**, *May 2024-May 2025*, AdimODT Undergraduate Research Project, METU. Project title: Foster family in Turkish society. Project no: E8.

B. COMPLETED PROJECTS

1. **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.
2. **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.
3. **Tutorial Speaker**, *18-20 October 2021*, Scientific and Technological Research Council (TÜBİTAK - 2237-B Programme). *Project title*: Project training in engineering (MAPRE).
4. **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.

5. **Secondary investigator**, *May 2016-November 2020*, European Community 7th Framework Programme (COST Programme). *Project title*: European network for statistical network science. *Project no*: CA15109.
6. **Tutorial Speaker**, *26-28 September 2019*, Scientific and Technological Research Council (TÜBİTAK - 2237-B Programme). *Project title*: Project training in engineering (MAPRE).
7. **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.
8. **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.
9. **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.
10. **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.
11. **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.
12. **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.
13. **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.
14. **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.
15. **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 and Electronic Engineering, METU). *Project title*: Teaching promising high-school students for the “Physics Olympiad”.
16. **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.

17. **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. Farnoudkia, H. and **Purutçuoğlu, V.** (2025). “Inference of time series chain graphical model”. *Journal of Dynamics and Games*, 12 (2), 183-195.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. Farnoudkia, H. and **Purutçuoğlu, V.** (2021) “Vine copula graphical models in the construction of biological networks”. *Hacettepe Journal of Mathematics and Statistics*, 50 (4), 11721184.
8. 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), 17491761.
9. 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.
10. 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.
11. **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.
12. 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, 52375242.

13. 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, 53595364.
14. 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.
15. 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.
16. Ayyıldız, E. and **Purutçuoğlu, V.** (2018) “Modeling of various biological networks via LCMARS”, *Journal of Computational Science*, 28, 148-154.
17. 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 (accepted for publication).
18. 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.
19. 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.
20. 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.
21. 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.
22. Dokuzoğlu, D. and **Purutçuoğlu, V.** (2017) “Comprehensive analyses of Gaussian graphical model under different biological networks”, *Acta Physica Polonica, Series A*, doi: 10.12693/APhysPolA.132. 1106, 132, 1106-1111.
23. **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.
24. **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.
25. 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.

26. **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.
27. **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.
28. 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.
29. 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.
30. Ağraz, M. and **Purutçuoğlu, V.** (2016) “Different types of Bernstein operators in inference of Gaussian graphical model”, *Cogent Mathematics*, 3, 1154706.1-11.
31. 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.
32. 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.
33. **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.
34. 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.
35. **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.
36. **Purutçuoğlu, V.** (2012) “Robust gene expression index”, *Mathematical Problems in Engineering*, doi: 10.1155/2011/182758, 1-12.
37. **Purutçuoğlu, V.** and Karagülle, S. (2011) “Stukel’s extended logistic regression analysis with R”, *Journal of Biostatistics-Turkish Clinics*, 3 (1), 49-56.
38. 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.
39. 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.

40. **Purutçuoğlu, V.** (2010) “An overview to stochastic simulation algorithms for biochemical systems (in Turkish)”, *Journal of Statistical Research*, 7 (1), 70-82.
41. **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.
42. **Purutçuoğlu, V.** and Wit, E. (2008) “Bayesian inference of the complex MAPK pathway under structural dependency”, *Journal of Statistical Research*, 6 (1), 1-17.
43. **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.
44. **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.
45. **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. Doğan-Dar, E. and **Purutçuoğlu, V.** (2025) “Non-parametric circular network construction via microarray data”, Chapter in: Operations Research: New Paradigms and Emerging Applications, Series II. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
2. Sarasir, F. and **Purutçuoğlu, V.** (2025) “Imputation of missing value in EMG signaling data”, Chapter in: Operations Research: New Paradigms and Emerging Applications, Series II. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
3. Atar, G. and **Purutçuoğlu, V.** (2025) “Statistical modeling of social data: a case study from TAYA 2016 survey”, Chapter in: Operations Research: New Paradigms and Emerging Applications, Series II. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
4. Kalaycı, B., **Purutçuoğlu, V.**, Weber, G. W., Uğur, Ö, and Defterli, Ö. (2025) “Application of various modelling techniques into consumer confidence index”, Chapter in: Operations Research: New Paradigms and Emerging Applications, Series II. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
5. Bahçivancı, B. and **Purutçuoğlu, V.** (2024) “Selection of threshold in binary graphes of biological networks”, 121-132. Chapter in: Smart Green Energy Production. Editors: P. Vasant, J.J. Thomas, R.R. Aguilar, and G.W. Weber, *De Gruyter*.
6. Demirbüken, S. and **Purutçuoğlu, V.** (2024) “Approximate stochastic simulation algorithms”, 67-93. Chapter in: Smart Green Energy Production. Editors: P. Vasant, J.J. Thomas, R.R. Aguilar, and G.W. Weber, *De Gruyter*.

7. Erkuş, E. C. and **Purutçuoğlu, V.** (2024) “Outlier detection in biomedical data: ECG focused approaches”. 161-181. Chapter in: *Smart Green Energy Production*. Editors: P. Vasant, J.J. Thomas, R.R. Aguilar, and G.W. Weber, *De Gruyter*.
8. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2024) “Model selection criteria with bootstrap algorithms: applications with biological networks”. Chapter in: *Advanced Optimization, Optimal Control and Meta-heuristics for Operational Research, Analytics and Decision-Making in Emerging Markets*. Editors: E. Munapo, J. J. Thomas, P. Vasant, G. W. Weber. *CRC Taylor and Francis*.
9. Farnoudkia, H. and **Purutçuoğlu, V.** (2023) “Bayesian inference for undirected network models”, 218-238. Chapter in: *Operations Research: New Paradigms and Emerging Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
10. Arı, F., Akan, E., Aktaş Dinçer, H., Erkuş, E.C., Farzin-Asanjan, M., Gökçay, D., Ileri, F., **Purutçuoğlu, V.**, and Somuncuoğlu, A. N. (2023) “Evaluation of data compression methods for efficient transport and classification of facial EMG signals”, 239-258. Chapter in: *Operations Research: New Paradigms and Emerging Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
11. Kalaycı, B., **Purutçuoğlu, V.**, and Weber, G. W. (2023) “Operation research in neuroscience: a recent perspective of operation research application in finance”, 170-190. Chapter in: *Operations Research: New Paradigms and Emerging Applications*. Editors: V. Purutçuoğlu, G. W. Weber, and H. Farnoudkia, *CRC/Taylor and Francis*.
12. Demirbüken, S. and **Purutçuoğlu, V.**(2022) “Extension of leap condition in approximate stochastic simulation algorithms of biological networks with 2nd and 3rd order Taylor expansion”. 271-290. Chapter in: *Mathematical Methods for Engineering Applications*. Editors: F. Yılmaz, A. Queiruga-Dios, M.S.S. Sanchez, D. Rasteiro, V.G. Martinez and J.M. Vaquero. *Springer*.
13. Seçilmiş, D., Ağraz, M. and **Purutçuoğlu, V.** (2022) “Two novel non-parametric models in the construction of biological networks”. 77-100. Chapter in: *Bayesian Reasoning and Gaussian Processes for Machine Learning Applications*. Editors: K. Hemachandran, S. Tayal, P. M. George, P. Singla, U. Köse. *CRC Taylor and Francis*.
14. Ayyıldız, E. and **Purutçuoğlu, V.** (2022) “Generating various types of graphical models via MARS”. 101-110. Chapter in: *Bayesian Reasoning and Gaussian Processes for Machine Learning Applications*. Editors: K. Hemachandran, S. Tayal, P. M. George, P. Singla, U. Köse. *CRC Taylor and Francis*.
15. **Purutçuoğlu, V.** and Farnoudkia, H. (2021) “Vine copula and artificial neural network models to analysis breast cancer data”. 287-304. Chapter in: *Artificial Intelligence for Data-Driven Medical Diagnosis*. Editors: D. Gupta, U. Kose, B. L. Nguyen, S. Bhattacharyya. *De Gruyter*.
16. Ağyüz, U., **Purutçuoğlu, V.**, Purutçuoğlu, E. and Ürün, Y. (2021) “Construction of a new model to investigate breast cancer data”. 11-29. Chapter in: *Modeling, Dynamics, Optimization and Bioeconomics IV*. Editors: A. Pinto and D. Zilberman. *Springer*.

17. Doğan Dar, E., **Purutçuoğlu, V.** and Purutçuoğlu, E. (2020) “Detection of HIV-1 protease cleavages sites via hidden Markov model and physicochemical properties of aminoacids”. 171-193. Chapter in: *Numerical Solutions of Realistic Nonlinear Phenomena*. Editors: J. A. T. Machado, N. Özdemir, D. Baleanu. *Springer*.
18. Erkuş, E. C. and **Purutçuoğlu, V.** (2019) “Feature extraction of hidden oscillation in ECG data via multiple-FOD method”. 47-56. Chapter in: *Artificial Intelligence and Applied Mathematics in Engineering Problems*. Editors: D. J. Hemanth, U. Kose *Springer*
19. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2019) “Comparative study for model selection in sparse biological networks and a new alternative approach”. 107-126. Chapter in: *Artificial Intelligence and Applied Mathematics in Engineering Problems*. Editors: D. J. Hemanth, U. Kose *Springer*
20. Seçilmiş, D. and **Purutçuoğlu, V.** (2019) “Modeling of biochemical networks via classification and regression tree methods”. 87-102. Chapter in: *Mathematical Methods in Engineering*. Editors: K. Taş, D. Baleanu and J.A. Mashado. *Springer*.
21. Ağraz, M. and **Purutçuoğlu, V.** (2019) “Empirical copula in the detection of batch effects”. 25-39. Chapter in: *Mathematical Methods in Engineering*. Editors: K. Taş, D. Baleanu and J.A. Mashado. *Springer*.
22. Tuncer, G. and **Purutçuoğlu, V.** (2018) “Major simulation tools for biochemical networks”, 443-467. Chapter in: *Modelling, Dynamics, Optimization and Bioeconomics III*. Editors: A. Pinto, Z. Zilberman. *Springer*.
23. **Purutçuoğlu, V.** (2018) “Stochastic modelling of biochemical networks and inference of model parameters”, 369-385. Chapter in: *Modelling, Dynamics, Optimization and Bioeconomics III*. Editors: A. Pinto, Z. Zilberman. *Springer*.
24. Ağraz, M. and **Purutçuoğlu, V.** (2016) “Transformations of data in deterministic modelling of biological networks”, 343-356. Chapter in: *Intelligent Mathematics II: Applied Mathematics and Approximation Theory*. Editors: O. Duman. *Springer*.
25. **Purutçuoğlu, V.** (2014) “Biological networks uncover evolution, disease, and gene functions (in Turkish)”, 291-314. Chapter in: *Bioinformatics for Biologist* (Translated from the book of P. Pevzner and R. Shamir entitled by the same name). Editor: Z. Kaya, J. Nobel Publisher.
26. Defterli, Ö., **Purutçuoğlu, V.**, and Weber, G. W. (2014) “Advanced mathematical and statistical tools in the dynamic modelling and simulation of gene-environment networks”, 235-257. Chapter in: *Modeling, Optimization, Dynamics and Bioeconomy*. Editor: D. Zilberman and A. Pinto. *Springer*.
27. **Purutçuoğlu, V.**, Kayış, E., and Weber, G. W. (2011) “Survey of background normalizations for Affymetrix arrays and a case study”, 199-219. Chapter in: *Advances in Intelligent Modelling and Simulation: Simulation Tools and Applications*. Editor: A. Byrski, Z. Oplatkova, M. Carvalho, and M. Kisiel-Dorohinicki. *Springer*.
28. Fahmi, M. F., Kartal, E., İyigün, C., Türkeş, M., Yozgatlıgil, C., **Purutçuoğlu, V.**, Batmaz, İ., and Köksal, G. (2011) “Determining the climate zones of Turkey by center-based clustering methods”, 171-177. Chapter in: *Nonlinear Dynamics of Complex Systems: Applications in*

Physical, Biological and Financial Systems. Editor: J. A. T. Machado, D. Baleanu, and A. Luo. Springer.

29. Wit, E., **Purutçuoğlu, V.**, O'Donovan, L., and Zhu, X. (2006) "Gaining weights . . . and feeling good about it", 31-38. Chapter in: *Microarray Technology and Cancer Gene Profiling*. Editor: S. Mocellin. Springer.

SUBMITTED AND ONGOING MANUSCRIPTS

1. Aktaş A., Taş E. A. and **Purutçuoğlu, V.**(2025). "Women's empowerment in family decision-making: an analysis of influential factors".
2. Kaygusuz, M. A. and **Purutçuoğlu, V.**(2025). "Detection of outliers via extended form of conformal robust neural network".
3. Kaygusuz, M. A., Gögebakan, M. and **Purutçuoğlu, V.**(2025). "Effect of bootstrapping in Gaussian mixture model".
4. Mogharabin, A. and **Purutçuoğlu, V.** (2025). "A bayesian network model for family dynamics, linguistic influences and happiness in Turkey".
5. Atar, G. and **Purutçuoğlu, V.**(2024). "Construction of statistical models for foster family in Turkey".
6. Sarasir, F. and **Purutçuoğlu, V.** (2024). "Imputation of missingness in cyclic and non-cyclic electromyography (EMG) signaling Data".
7. Doğan-Dar, E., **Purutçuoğlu, V.** and SenGupta, A. (2024). "Non-parametric circular-circular graphical network".
8. Atanda, O., **Purutçuoğlu, V.**, Wit, E. and Weber, G.-W. (2024). "Detection of degree distribution for biological networks in Pearson Family and its approximation".

PUBLICATIONS IN PROCEEDINGS

A. FULL PAPERS

1. Karakaya, Ş.Ş., Erkuş, E.C., **Purutçuoğlu, V.** and Özkan, B.K. (2025) "A comparative study of clustering algorithms on power consumption data: the role of cyclic feature extraction", *Proceeding of the 8th International Conference on Artificial Intelligence and Big Dat (ICAIBD 2025)*, Chengdu, China.
2. Özpamuk, T. and **Purutçuoğlu, V.** (2025) "Domestic violence in Turkish families: demographics and analysis via national survey in 2016", *Proceeding of the 8th World Women Studies Conference*, Antalya, Turkey.
3. Kılıç, M., Metin, K. and **Purutçuoğlu, V.** (2025) "Income satisfaction in Turkish families from 2016 national survey data ", *Proceeding of the 8th World Women Studies Conference*, Antalya, Turkey.

4. Karakaya, Ş. Ş and **Purutçuoğlu, V.** (2024) “Optimizing ECG signal classification using circular statistics ”, *Proceeding of 8th International Conference on Mathematics (ICOMATH 2024)*, İstanbul, Turkey.
5. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2024) “Optimal alternative multiple testing procedure for imputation single cell RNA sequence data”, *Proceeding of 3rd International Conference on Applied Mathematics in Engineering (ICAME 2024)*, Balıkesir, Turkey.
6. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2024) “Conformal estimation of treatment effect on biological networks with continuous time and missing values”, *Proceeding of 8th International Conference on Mathematics (ICOMATH 2024)*, İstanbul, Turkey.
7. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2024) “Efficient and faster multiple testing procedure for message passing algorithm with bootstrap procedure”, *Proceeding of 8th International Conference on Mathematics (ICOMATH 2024)*, İstanbul, Turkey.
8. Sarasir, F. and **Purutçuoğlu, V.** (2024) “Handling missing circular EMG data: modifying data structures for effective K-NN and EM imputation”, *Proceeding of 10th International Conference on Computational and Experimental Science and Engineering (ICCESEN 2024)*, Antalya, Turkey.
9. Atar, G. and **Purutçuoğlu, V.** (2023) “Application of machine learning methods in the analyses of foster family”, *Proceeding of 2nd International Congress on Social Sciences: Artificial Intelligence and Social Sciences*, Ankara, Turkey.
10. Atar, G. and **Purutçuoğlu, V.** (2023) “Statistical analyses of geriatric data taken from TAYA national survey”, *Proceeding of 7th International Conference on Medical and Health Sciences (ISPEC 2023)*, Ordu, Turkey.
11. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Control of standard error of average treatment effect in survival data”, *Proceeding of 6th International Researchers, Statisticians, and Young Statisticians Congress (IRSYS 2023)*, İstanbul, Turkey.
12. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Conditional independence testing for conformal robust neural networks in outlier detection ”, *Proceeding of 6th International Researchers, Statisticians, and Young Statisticians Congress (IRSYS 2023)*, İstanbul, Turkey.
13. Varol, F. and **Purutçuoğlu, V.** (2023) “A case study by using 2016 TBNA survey data: Divorce in Turkey”, *Proceeding of 7th International Conference on Mathematics (ICOMATH 2023)*, İstanbul, Turkey.
14. Sarasir, F. and **Purutçuoğlu, V.** (2023) “Imputation of missing value in EMG signaling data”, *Proceeding of 7th International Conference on Mathematics (ICOMATH 2023)*, İstanbul, Turkey.
15. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Distribution-free SLOPE variable selection with bootstrap procedure”, *Proceeding of 7th International Conference on Mathematics (ICOMATH 2023)*, İstanbul, Turkey.
16. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Conditional randomization test of heterogeneous effect on biochemical signaling data with conformal inference”, *Proceeding of 6th International Conference on Mathematics (ICOMATH 2023)*, İstanbul, Turkey.

17. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Deep neural networks for heterogeneous effect on biological networks ”, *Proceeding of the 10th International Congress on Fundamental and Applied Sciences (ICFAS 2023)*, İstanbul, Turkey.
18. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2023) “Efficient multiple testing procedure for heterogeneous effect with survival forest ”, *Proceeding of the 10th International Congress on Fundamental and Applied Sciences (ICFAS 2023)*, İstanbul, Turkey.
19. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2022) “Detection of anomalies via robust artificial neural networks and gaussian mixture models ”, *Proceeding of the 9th International Conference on Computational and Experimental Science and Engineering (ICCESSEN 2022)*, Antalya, Turkey.
20. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2022) “Conditional randomization test for causal additive models in biological networks ”, *Proceeding of the 9th International Conference on Computational and Experimental Science and Engineering (ICCESSEN 2022)*, Antalya, Turkey.
21. Kalaycı, B. and **Purutçuoğlu, V.** (2022) “Modelling the mutual interaction of finance and human factor by using sentiment index data ”, *Proceeding of 41st EBES Conference*, Berlin, Germany.
22. Kalaycı, B. and **Purutçuoğlu, V.** (2022) “Modelling the mutual interaction of finance and human factor by using machine learning techniques ”, *Proceeding of 8th International Conference on Economics of Turkish Economic Association (IceTEA2022)*, Kapadokya, Turkey.
23. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2022) “Quantile regression neural network models in the description of biological networks with outliers observations”, *Proceeding of 6th International Conference on Mathematics (ICOMATH 2022)*, İstanbul, Turkey.
24. Kaygusuz, M.A., Göğebakan, M., Akoğul, S. and **Purutçuoğlu, V.** (2022) “Bootstrap in gaussian mixture models and performance assessment”, *Proceeding of 6th International Conference on Mathematics (ICOMATH 2022)*, İstanbul, Turkey.
25. Kaygusuz, M.A. and **Purutçuoğlu, V.** (2022) “Effect of bootstrapping in sparse biological data and model selection via likelihood ratio test ”, *Proceeding of 24. International Conference on Computational Statistics (COMPSTAT 2022)*, Bologna, Italy.
26. Erkuş, E. C. and **Purutçuoğlu, V.** (2022) “Anomaly detection in sliding windows using dissimilarity metrics in time series data”, *Proceeding of 4rt International Conference on Artificial Intelligence and Applied Mathematics in Engineering (ICAIAME 2022)*, Baku, Azerbaijan.
27. **Purutçuoğlu, V.** and Köstekçi, S.M. (2022) “Distribution control in approximate stochastic simulation algorithm of biological systems”, *Proceeding of 14th International Conference on Engineering and Natural Sciences (ISPEC 2022)*, Sivas, Turkey.
28. **Purutçuoğlu, V.** and Varol, D. (2022) “A case study in statistical modeling on divorce occurrence in Turkish family structure”, *Proceeding of 14th International Conference on Engineering and Natural Sciences (ISPEC 2022)*, Sivas, Turkey.
29. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2021) “Artificial neural networks for nonparametric regression with biological data”, *Proceeding of 5th International Online Conference on Mathematics (ICOMATH 2021)*, Virtual International Congress, Turkey.

30. Demirbüken, S. and **Purutçuoğlu, V.** (2021) “Extension of leap condition in approximate stochastic simulation algorithms of biological networks with 2nd and 3rd order Taylor expansion”, *Proceeding of 2nd International Conference on Mathematics and Its Applications in Science and Engineering (ICMASE 2021)*, Virtual International Congress, Spain.
31. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2021) “Random forest regression model extended by alternative model selection procedure”, *Proceeding of 2nd International Conference on Applied Mathematics in Engineering (ICAME 2021)*, Virtual International Congress, Turkey.
32. Erkuş, E.C. and **Purutçuoğlu, V.** (2021) “A new frequency domain and dynamic time warping based feature”, *Proceeding of 2nd International Conference on Advanced Information Scientific Developments (ICAISD 2021)*, Virtual International Congress, Indonesia.
33. Erkuş, E.C. and **Purutçuoğlu, V.**, Arı, F. and Gökçay, D. (2020) “Comparison of several machine learning classifiers for arousal classification: A preliminary study”, *Proceeding of Medical Technologies Congress (TIPTEKNO 2020)*, Virtual International Congress, Turkey.
34. Somuncuoğlu, A. N., **Purutçuoğlu, V.**, Arı, F. and Gökçay, D. (2020) “Investigation on the use of hidden layers, different numbers of neurons and different activation functions to detect pupil dilation responses to stress”, *Proceeding of Medical Technologies Congress (TIPTEKNO 2020)*, Virtual International Congress, Turkey.
35. Farzin, M., **Purutçuoğlu, V.**, Arı, F. and Gökçay, D. (2020) “Comparison of data interpolation methods in time course pupil diameter data”, *Proceeding of Medical Technologies Congress (TIPTEKNO 2020)*, Virtual International Congress, Turkey.
36. Köstekçi, S. M. and **Purutçuoğlu, V.** (2020) “A new approximate stochastic simulation algorithm for biochemical systems”, *Proceeding of the 4th International Conference on Mathematics (ICOMATH 2020)*, Virtual International Conference, Turkey.
37. Demirbüken, S. and **Purutçuoğlu, V.** (2020) “Extension of leap condition in approximate stochastic simulation algorithms of biological networks”, *Proceeding of the 4th International Conference on Mathematics (ICOMATH 2020)*, Virtual International Conference, Turkey.
38. Erkuş, E. C. and **Purutçuoğlu, V.** (2019) “Description of Turkish construction sector via İstanbul stock market data”, *Proceeding of the 5th International Conference on Natural and Engineering Sciences (ICNES 2019)*, İstanbul, Turkey.
39. **Purutçuoğlu, V.** and Varol, D. (2019) “Descriptive features of spousal relation in Turkey”, *Proceeding of the International Conference on Mathematics (ICOMATH 2019)*, İstanbul, Turkey.
40. **Purutçuoğlu, V.** (2019) “Description of BIST 50 via volatility models and sector-based variables”, *Proceeding of the 3rd International Congress on Tourism, Economic and Business Science Congress (ICTEBS-2019)*, Sivas, Turkey.
41. Bahçivancı, B. and **Purutçuoğlu, V.** (2019) “Selection of optimal threshold value in binary construction of biological networks”, *Proceeding of the 4th International Conference on Computational Mathematics and Engineering Sciences (CMES 2019)*, Antalya, Turkey.

42. Erkuş, E. C. and **Purutçuoğlu, V.** (2019) “Calculation of optimal number of Monte Carlo runs for normally distributed datasets, *Proceeding of the International Conference on Applied Analysis and Mathematical Modeling (ICAAMM 2019)*, İstanbul, Turkey.
43. Farnoudkia, H. and **Purutçuoğlu, V.** (2019) “Nested Bayesian inference algorithm in the construction of time-course biological networks data, *Proceeding of the International Conference on Applied Analysis and Mathematical Modeling (ICAAMM 2019)*, İstanbul, Turkey
44. Bülbül, G. B. and **Purutçuoğlu, V.** (2018) “Model selection in MARS-constructed biological networks, *Proceeding of the 5th International Conference on Computational and Experimental Science and Engineering (ICCESN 2018)*, Antalya, Turkey.
45. Erkuş, E. C. and **Purutçuoğlu, V.** (2018) “Two-stage outlier detection algorithm based on Fourier transform: Real data applications, *Proceeding of the International Conference on Innovative Engineering Applications (CIEA 2018)*, Sivas, Turkey.
46. Farnoudkia, H. and **Purutçuoğlu, V.** (2018) “Inference of time series chain graphical model, *Proceeding of the International Conference on Mathematics (ICOMATH 2018)*, İstanbul, Turkey.
47. Bülbül, G.B. and **Purutçuoğlu, V.** (2018) “Information complexity criterion in the Gaussian graphical model: real data applications, *Proceeding of the International Conference on Mathematics (ICOMATH 2018)*, İstanbul, Turkey.
48. Varol, D., Akal, T. and **Purutçuoğlu, V.** (2017) “Is the log-normal density appropriate for one-channel microarray data?, *Proceeding of the International Conference on Advances in Science (ICAS 2017)*, İstanbul, Turkey.
49. Seçilmiş, D. and **Purutçuoğlu, V.** (2017) “Nonparametric versus parametric models in inference of protein-protein interaction networks, *Proceeding of the International Conference on Advances in Science and Arts (ICASA 2017)*, İstanbul, Turkey.
50. Ağraz, M. and **Purutçuoğlu, V.** (2017) “Inference of the Gaussian graphical model via the modified maximum likelihood approach, *Proceeding of İstanbul International Conference on Progress in Applied Science (ICPAS 2017)*, İstanbul, Turkey.
51. **Purutçuoğlu, V.** and Farnoudkia, H. (2017) “Bayesian inference of biological networks whose components are linearly dependent”, *Proceeding of International Conference on Progress in Applied Science (ICPAS 2017)*, İstanbul, Turkey.
52. Yazıcı, M., **Purutçuoğlu, V.** and Altıntan, D. (2016) “Application of stochastic simulations of biological networks under different impulsive scenarios”, *Proceeding of the 3rd International Conference on Data Mining, Internet Computing, and Big Data (BigData2016)*, Konya, Turkey.
53. **Purutçuoğlu, V.** and Odunsi, O. (2016) “Degree distribution of real biological networks”, *Proceeding of the 3rd International Conference on Data Mining, Internet Computing, and Big Data (BigData2016)*, Konya, Turkey.
54. Yazıcı, C., **Purutçuoğlu, V.**, Yozgatlıgil, C., and Batmaz, İ. (2013) “Detection of unreliable measurements in long-term time-series via data mining techniques: case in Turkish climate data”, *Proceeding of the Global Reach of Industrial Engineering*, İstanbul, Turkey.

55. **Purutçuoğlu, V.** and Kayış, E. (2012) “Comparing clustering techniques for real microarray data”, *Proceeding of IEEE/ACM International Conference on Social Networks Analysis and Mining*, İstanbul, Turkey (Citation number: 2).
56. Fahmi, F., Kartal, E., İyigün, C., Yozgatlıgil, C., **Purutçuoğlu, V.**, Çınar, İ., Aslan, S., Öztürk, M. Z., Türkeş, M., and Batmaz, İ. (2011) “Studying the effect of climate change on Turkey by clustering techniques (in Turkish)”, *Proceeding of the National Geographical Congress*, İstanbul, Turkey.
57. **Purutçuoğlu, V.**, Erdem, T., and Weber, G. W. (2011) “Inference of the JAK-STAT gene network via graphical models”, *Proceeding of the 23rd International Conference on Systems Research, Informatics and Cybernetics*, Baden, Germany.
58. Yozgatlıgil, C., Yazıcı, C., **Purutçuoğlu, V.**, and Batmaz, İ. (2011) “Validity of homogeneity tests for meteorological time series data: a simulation study”, *Proceeding of the 58th ISI World Statistics Congress*, Dublin, Ireland.
59. Quek, E. M. P., **Purutçuoğlu, V.**, Sambanthamurthi, R., and Weber, G. W. (2011) “Modelling lipid biosynthesis pathways of oil palms by boolean and graphical approaches”, *Proceeding of the 6th International Symposium on Health, Informatics and Bioinformatics (HIBIT 2011)*, İzmir, Turkey.
60. Konak, D. and **Purutçuoğlu, V.** (2010) “Detection of calendar effects on Esenboğa, Atatürk, and London City International Airports by dummy variable method (in Turkish)”, *Proceeding of the 7th National Symposium of Statistical Days*.
61. **Purutçuoğlu, V.** (2010) “Stochastic simulation of large biochemical systems by approximate Gillespie algorithm”, *Proceeding of the 5th International Symposium on Health, Informatics and Bioinformatics*, Antalya, Turkey.
62. **Purutçuoğlu, V.** and Wit, E. “Inclusion of convoluted measurements in Bayesian inference of the MAPK/ERK pathway via multivariate diffusion model”, *Proceeding of the 3rd International Symposium on Health, Informatics and Bioinformatics*, İstanbul, Turkey, 2008.
63. **Purutçuoğlu, V.** and Wit, E. (2006) “Stochastic modelling of the MAPK signalling pathway”, *Proceeding of the 21st International Workshop on Statistical Modelling*, Galway, Ireland.

B. SELECTED PUBLISHED ABSTRACTS

1. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2025) “Efficient multiple testing procedure for survival instrumental variables and nonparametric additive instrumental variables”, *Proceeding of the 8th International Conference on Mathematical Advances and Applications (ICOMAA2025)*, İstanbul, Turkey.
2. Kaygusuz, M. A. and **Purutçuoğlu, V.** (2025) “Weighted multiple testing procedure for graph neural networks with ordinary differential equations for single cell data”, *Proceeding of the 8th International Conference on Mathematical Advances and Applications (ICOMAA2025)*, İstanbul, Turkey.

3. Atar, G., Sarasir, F. and **Purutçuoğlu, V.** (2024) “Parametric inference of circular-circular graphical model in biological networks , *Proceeding of 11th International Conference on Computational and Experimental Science and Engineering (ICCESEN 2024)*, Antalya, Turkey.
4. Atar, G. and **Purutçuoğlu, V.** (2023) “Mathematical modeling of elderly in Turkish family , *Proceeding of 3th International Aegean Health Areas Symposium 2023*, Virtual Conference, Turkey.
5. 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.
6. 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 Societys Eastern Mediterranean Region (EMR-IBS 2023)*, İzmir, Turkey.
7. 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 Societys Eastern Mediterranean Region (EMR-IBS 2023)*, İzmir, Turkey.
8. 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.
9. 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.
10. 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.
11. 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.
12. Doğan - Dar, E. and **Purutçuoğlu, V.** (2020) “Construction of circular-circular graphical network via simulated and real data , *COSTNET Statistical Network Science Virtual Conference*, Munich, Germany.
13. 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.
14. 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.
15. **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.

16. **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.
17. 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.
18. **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.
19. **Purutçuoğlu, V.** and Wit, E. (2009) “Rao-blackwellized estimates for the multivariate Bayesian inference”, *Proceeding of the International Conference of Mathematical Sciences*, İstanbul, Turkey.
20. **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.
21. **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 Tath, 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 Sup  r 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, Bah   ehir University,   stanbul, 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),   stanbul, Turkey, 17 June 2011.
14. “Network structure”, *invited short course, 6th International Symposium on Health, Informatics and Bioinformatics* (HIBIT’11),   zmir, 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), Florian  polis, 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 bioinformatics”, 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

- *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

- **PhD thesis, ongoing.** “Enduser-friendly and reliable explanation techniques for deep learning applied in biomedical data”.
- **PhD thesis, ongoing.** “Feedback systems with machine learning and control strategies applied to biological systems”.

- **PhD thesis, ongoing.** “Network modeling of social survey data”.
- **PhD thesis, June 2023.** Betül Kalaycı, “Modeling mutual interaction of finance and human factor and various sorts of indices”.
- **PhD thesis, June 2023.** Ekin Can Erkuş, “Collective anomaly detection in time series using pitch frequency and dissimilarity features”.
- **PhD thesis, January 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”.
- **MSc thesis, continue.** “Children status in Turkish family”.
- **MSc thesis, continue.** “Decision support algorithms for ECG data”.
- **MSc thesis, continue.** “Data preprocessing of switch and router systems”.
- **MSc thesis, December 2024.** Fatemeh Sarasir, “The imputation of missingness in cyclic and non-cyclic electromyography signal data”.
- **MSc thesis, September 2023.** Gizem Atar, “Application of statistical methods in the analyses of foster family”.
- **MSc thesis, September 2021.** Saliha Yıldırım Demirbüken, “Approximate stochastic simulation algorithm based on nonparametric goodness-of-fit test”.
- **PhD thesis, July 2020.** Hajar Farnoudkia, “Bayesian inference of the Gaussian graphical model for biochemical networks”.
- **MSc thesis, December 2019.** Barış Su Karakelle, “Analyses and modelling of ovarian cancer microarray data”.
- **MSc thesis, September 2019.** Başak Bahçivancı, “Biological pathway construction via continuous and categorical data”.
- **PhD thesis, September 2019.** Ezgi Ayyıldız, “Inference of large-scale networks via statistical approaches”.
- **MSc thesis, June 2019.** Gül Bahar Bülbül, “Model selection criteria in the construction of protein-protein interaction networks”.
- **PhD thesis, May 2017.** Melih Ağraz, “Different types of modellings and the inference of model parameters for complex biological systems”.
- **MSc thesis, April 2017.** Deniz Seçilmiş, “Deterministic modelling and inference of biochemical networks”.
- **MSc thesis, June 2016.** Damla Dokuzoğlu, “Application of copulas in graphical models for inference of biological systems”.
- **MSc, April 2016.** Müge Yazıcı, “Stochastic simulations of biological networks under impulses”.

- **MSc, September 2015.** Selim Yayla (Co-advisor), “Regulatory networks studied by ellipsoidal calculus”.
- **MSc, June 2015.** Gökçe Tuncer, “Comparative analysis in deterministic simulation of biological systems”.
- **MSc, August 2014.** Bilge Sürün (Co-advisor), “Analysis of motifs in microRNA-transcription factor gene regulatory networks”.
- **MSc, September 2014.** Omolola Odunsi, “Detection of the distribution and parameter estimation for the departing connectivity in biological networks”.
- **MSc, July 2014.** Duygu Varol, “Comparative statistical microarray analysis of yeast data under heat shock stress”.
- **MSc, May 2013.** Ezgi Ayyıldız, “Gaussian graphical approaches in estimation of biological systems”.
- **MSc, March 2013.** Tülay Akal, “Gene expression indices for single-channel microarrays”.

LANGUAGES

- Turkish (native), English (fluent), French (intermediate)

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, Università della Svizzera Italiana (USI), 6900, Lugano, Switzerland. Email: e.c.wit@rug.nl
- Prof. Dr. Gerhard Wilhelm Weber: Faculty of Engineering Management, Poznan University of Technology, 60-965, Poznan, Poland. Email: gerhard-wilhelm.weber@put.poznan.pl
- Prof. Dr. Ömür Uğur: Institute of Applied Mathematics, Middle East Technical University, 06800, Ankara, Türkiye. Email: ougur@metu.edu.tr