Dr. Deniz Akdemir

Senior Clinical Data Scientist - Statistical Genomics Consultant

Core Skills

- **Statistical Genomics:** Genomic selection, multi-trait methodologies, genomic prediction, GWAS, models for epistasis and genotype by environment interactions, optimization of plant and animal breeding programs.
- **Statistics:** Multivariate analysis, high-dimensional data modeling, Bayesian methods, machine learning, deep learning, data science, biostatistics.
- **Statistical Computation:** Expert in R and Python for statistical programming and analysis, proficient in SAS and C++.
- **Software Development:** Development of research and commercial grade software.
- **Management and administration:** Strategic planning, project management, team leadership, grant/patent writing, budgeting, accounting.

Career Summary

- **Senior Clinical Data Scientist, National Marrow Donor Program, Minneapolis, USA (2023 - Current):** Engaged in statistical and machine learning analysis of stem cell transplant data, focusing on research into donor optimization. Applied for grants and submitted manuscripts to peer-reviewed journals. Wrote patent applications.
- **Clinical Data Scientist, National Marrow Donor Program, Minneapolis, USA (2021 - 2023):** Engaged in statistical and machine learning analysis of stem cell transplant data, focusing on research into donor optimization.
- **Postdoctoral Research Associate, School of Agriculture and Food Science, University College Dublin, Dublin, Ireland (2019 - 2021):** Conducted research on methods for combining heterogeneous genomic and phenotypic datasets and prepared statistical software for data analysis.
- **Statistical Consultant, Cornell Statistical Consulting Unit, Cornell University, Ithaca, NY, USA (2017 - 2019):** Provided statistical consulting services for researchers at Cornell University, including the preparation and presentation of statistics workshops.
- **Postdoctoral Research Associate, Department of Plant Breeding and Genetics, Cornell University, Ithaca, NY, USA (2011 - 2017):** Focused on research developing new methodologies in genomic selection and prediction, mixed models, and machine learning, advising graduate students and preparing statistical software.
- **Visiting Assistant Professor, Department of Statistics and Actuarial Science, University of Central Florida, Orlando, FL, USA (2010 - 2011):** Responsibilities included teaching Data Mining Methodology, Theoretical Statistics, Applied Time Series Analysis, and Nonparametric Statistics.
- **Visiting Assistant Professor, Department of Mathematics and Statistics, Ohio Northern University, Ada, OH, USA (2009 - 2010):** Taught Statistics for Profession-

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als, Statistics for Engineers, and Statistical Computing, catering to various undergraduate levels.

Workshops and Training Sessions

- **Genomic Assisted Breeding Workshops:** Conducted workshops in the USA, Ireland, Spain, and Belgium, educating the agricultural community on genomic technologies.
- **Public Speaking:** Presented at various international conferences including EFI conference in Geneva and ASHI Annual Meeting in San Antonio.

Publications

Akdemir, D., & Beavis, W. D. (2021). TrainSel: An r package for selection of training populations. *BMC Bioinformatics*, *22*(1), 1–10. https://doi.org/10.1186/s12859-021-04005-x

Akdemir, D., & Isidro-Sánchez, J. (2021). Training set optimization for sparse phenotyping in genomic selection. *G3: Genes, Genomes, Genetics*, *11*(10), jkab249. https://doi.org/10.1093/g3journal/jkab249

Akdemir, D., Isidro-Sánchez, J., & Leyer, M. (2020). Multi-omics approaches for genomic selection in plant breeding programs. *Journal of Experimental Botany*, *71*(18), 5215–5226. https://doi.org/10.1093/jxb/eraa285

Akdemir, D., & Isidro-Sánchez, J. (2019). Multi-objective optimized genomic breeding strategies for sustainable food improvement. *Heredity*, *122*(5), 672–683. https://doi.org/10.1038/s41437-018-0147-1

Akdemir, D., Isidro-Sánchez, J., & Jannink, J.-L. (2016). Genome-wide prediction models that incorporate de novo GWAS results. *PLoS ONE*, *11*(8), e0161054. https://doi.org/10.1371/journal.pone.0161054

Akdemir, D., & Jannink, J.-L. (2016). Efficient breeding by genomic mating. *Frontiers in Genetics*, *7*(5), 210. https://doi.org/10.3389/fgene.2016.00210

Akdemir, D., Isidro-Sánchez, J., & Jannink, J. L. (2015). Genomic selection and association mapping in rice (oryza sativa): Effect of trait genetic architecture, training population composition, marker number and statistical model on accuracy of rice genomic selection in elite, tropical rice breeding lines. *PLoS Genetics*, *11*(6), e1005350. https://doi.org/10.1371/journal.pgen.1005350

Akdemir, D., Isidro-Sánchez, J., & Jannink, J.-L. (2015). Training set optimization under population structure in genomic selection. *Theoretical and Applied Genetics*, *128*(1), 145–158. https://doi.org/10.1007/s00122-014-2418-4

Akdemir, D., Jannink, J.-L., & Isidro-Sánchez, J. (2015). Optimization of genomic selection training populations with a genetic algorithm. *Genetics Selection Evolution*, *47*(1), 38. https://doi.org/10.1186/s12711-015-0116-6

Akdemir, D., & Jannink, J.-L. (2014). Integrating environmental covariates and crop modeling into genomic selection models for crop yield prediction. *Theoretical and Applied Genetics*, *127*(12), 2665–2677. https://doi.org/10.1007/s00122-014-2406-8

Education

- **PhD. in Statistics**, Bowling Green State University, Bowling Green, OH, USA, 2009.
- **M.A. in Applied Statistics**, Bowling Green State University, Bowling Green, OH, USA, 2004.
- **M.S. in Statistics**, Middle East Technical University, Ankara, Turkey, 2003.

- **B.A. in Business Administration**, Middle East Technical University, Ankara, Turkey, 1999.

Professional References

- **Dr. Yung-Tsi Bolon**
  - **Affiliation:** Director, Immunobiology & Bioinformatics Research, NMDP, Minneapolis, Minnesota, United States
  - **Relationship:** Supervisor at the National Marrow Donor Program
  - **Contact:** `ybolon@nmdp.org`
- **Dr. Julio Isidro-Sanchez**
  - **Affiliation:** Associate Professor: Centro de Biotecnologia y Genomica de Plantas, Universidad Politecnica de Madrid, Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria, Campus de Montegancedo - UPM, 28223-Pozuelo de Alarcon, Madrid, Spain
  - **Relationship:** Expert in plant breeding and genetics, collaborator on various projects
  - **Contact:** `j.isidro@upm.es`
- **Dr. Jhonathan Pedroso**
  - **Affiliation:** Research Scientist at Corteva Agriscience, Corteva, Johnston, Iowa, USA
  - **Relationship:** Industry partner in genomic tool development, contributed to software enhancements
  - **Contact:** `jhowpd@gmail.com`
- **Dr. Lynn Johnson**
  - **Affiliation:** Interim Director and Statistical Consultant, Cornell Statistical Consulting Unit, Cornell University, Ithaca, NY, USA
  - **Relationship:** Coworker at the Cornell Statistical Consulting Unit
  - **Contact:** `lms86@cornell.edu`
- **Dr. Roberto Fritsche Neto**
  - **Affiliation:** Assistant Professor, Department of Plant, Environmental Management & Soil Sciences, LSU
  - **Relationship:** Collaborator on various projects
  - **Contact:** `rneto1@lsu.edu`