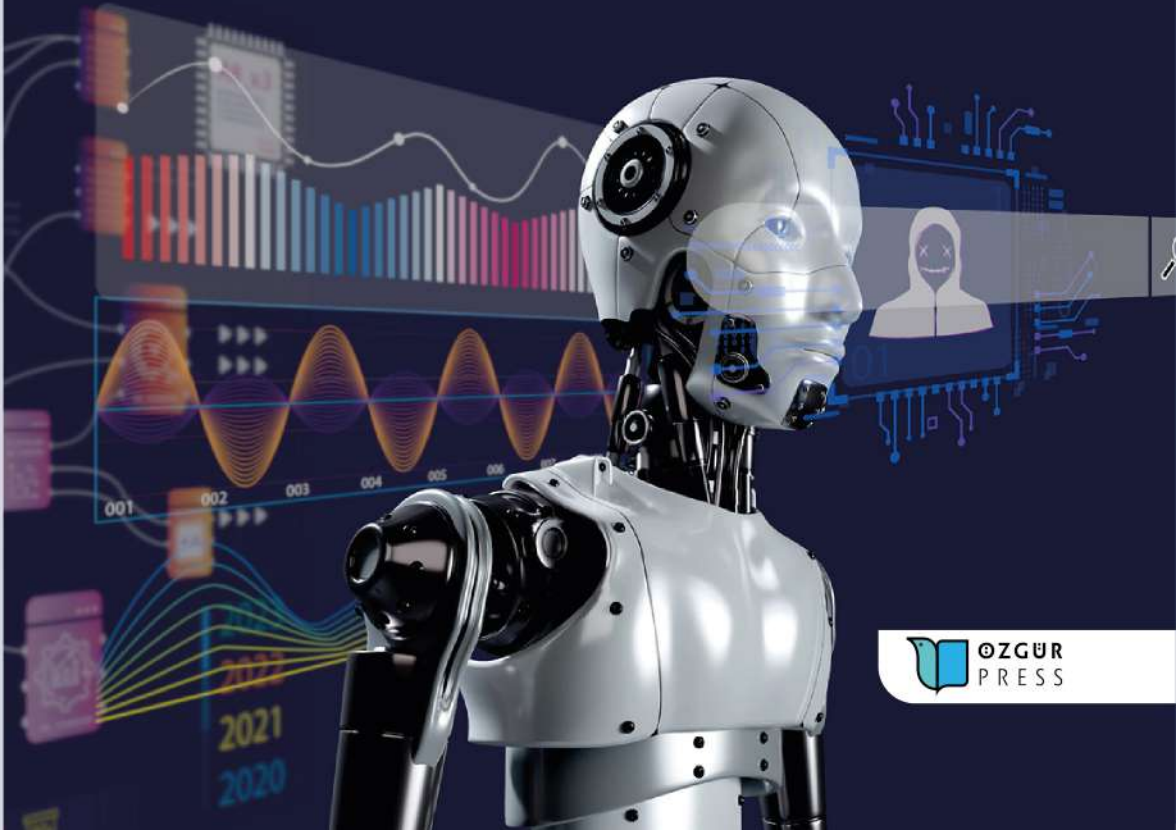


Current Approaches in Applied Statistics - I

Editors: Assoc. Prof. Yalçın TAHTALI • Assoc. Prof. İbrahim DEMİR
Assist. Prof. Lütfi BAYYURT



 OZGUR
PRESS

Current Approaches in Applied Statistics - I

Editors:

Assoc. Prof. Yalçın TAHTALI

Assoc. Prof. İbrahim DEMİR

Assist. Prof. Lütfi BAYYURT



Published by

Özgür Yayın-Dağıtım Co. Ltd.

Certificate Number: 45503

📍 15 Temmuz Mah. 148136. Sk. No: 9 Şehitkamil/Gaziantep

☎ +90.850 260 09 97

📞 +90.532 289 82 15

🌐 www.ozguryayinlari.com

✉ info@ozguryayinlari.com

Current Approaches in Applied Statistics - I

Editors: Assoc. Prof. Yalçın TAHTALI • Assoc. Prof. İbrahim DEMİR
Assist. Prof. Lütfi BAYYURT

Language: English

Publication Date: 2025

Cover design by Mehmet Çakır

Cover design and image licensed under CC BY-NC 4.0

Print and digital versions typeset by Çizgi Medya Co. Ltd.

ISBN (PDF): 978-625-5646-94-1

DOI: <https://doi.org/10.58830/ozgur.pub862>



This work is licensed under the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc/4.0/>
This license allows for copying any part of the work for personal use, not commercial use, providing author attribution is clearly stated.

Suggested citation:

Tahtalı, Y. (ed), Demir, İ. (ed), Bayyurt, L. (ed) (2025). *Current Approaches in Applied Statistics-I*.

Özgür Publications. DOI: <https://doi.org/10.58830/ozgur.pub862>. License: CC-BY-NC 4.0

The full text of this book has been peer-reviewed to ensure high academic standards. For full review policies, see <https://www.ozguryayinlari.com/>



Preface

This book, titled *Current Approaches in Applied Statistics*, is a compilation of recent academic studies produced by researchers from different disciplines. The book covers not only theoretical contributions in the field of statistics, but also the innovative dimensions of methods used in a wide variety of application areas.

Today's rapidly increasing volume and diversity of data has led statistics to transcend being a science based solely on mathematical foundations and take on a critical role in many fields, from health sciences to engineering, social sciences to environmental research. Reflecting this broad sphere of influence, this book aims to present readers with both theoretical approaches and application examples from different disciplines.

The chapters in this book, prepared with contributions from international researchers, highlight the current importance of statistics, the methodological challenges encountered, and new solutions. Readers will encounter content that is useful both academically and practically in areas such as statistical modeling, data mining, machine learning, biostatistics, and social statistics.

We believe this work will provide researchers, graduate students, and practitioners with a comprehensive overview of current approaches to statistics. We thank all the authors and reviewers who contributed to this book and hope it will make a valuable contribution to the scientific community.

Contents

Preface iii

Chapter 1

Testing the Relative Purchasing Power Parity in Türkiye: Comparing the
Headline and Core Inflation 1

Ahmet Arvas

Mercan Hatipoğlu

Chapter 2

A Computational Study on Sobol' Sequences 15

Babri Tokmak

Ömür Uğur

Chapter 3

An Turkey's Biodiesel Potential and the Economics of Related Agricultural
Products 49

Berra Kocakoç

Gülistan Erdal

Chapter 4

Transition to Green Cosmetics: An Analysis on Plastic Waste, Certification,
and Ethical Consumption 59

Beyhan Doğan

Dursun Yılmaz

Chapter 5

A Legal and Economic Assessment of the Alignment Between Regional Wage Levels and Living Income in Agriculture: The Case of Seasonal and Permanent Employment 71

Cem Gül

Bilge Gözener

Mehmet Can Kaya

Chapter 6

Sustainable Consumption, Ethical and Environmental Factors in the Context of Cosmetic Product Preferences 89

Dursun Yılmaz

Chapter 7

Sustainability in the Cosmetics Industry: Environmental Impacts, Statistics, and Solutions 99

Dursun Yılmaz

Chapter 8

Enhanced Rank-Based Correlation Estimation Using Smoothed Wilcoxon Rank Scores 119

Feridun Taşdan

Rukiye Dağalp

Chapter 9

The Impact of Climate Variables on Wheat Yield in Turkey 137

Melike Tekin

Gülistan Erdal

Chapter 10

Multi-Frequency and Multi-Protocol RFID Card Reader Device: Hardware and Application Design 147

Mustafa Talip Koyuncu

Burak Demir

Muhammet Fatih Aslan

Akif Durdu

Chapter 11

Structural and Statistical Analysis of Finite Mixture Models Based on q -Calculus 159

Nurgül Okur

Chapter 12

Sustainable Beauty Concept: A Conceptual Review Through Environmental, Social, and Economic Dimensions 173

Tuğçe Yıldırım Dal

Dursun Yılmaz

Chapter 13

Stationarity Structure of Türkiye's Industrial Production Index 191

Uğur Ayık

Chapter 14

Homogeneous and Hybrid q -Mixture Forms of the Uma Distribution 201

Nurgül Okur

Hasan Hüseyin Gül

Chapter 15

Evaluating the Economic Landscape of Turkey's Cosmetics Industry (2020–2022) 217

Tuğçe Yıldırım Dal

Dursun Yılmaz

An Turkey's Biodiesel Potential and the Economics of Related Agricultural Products

Berra Kocakoç¹

Gülistan Erdal²

Abstract

With the rapid increase in the world population and the intensification of industrialization, the need for energy to sustain human life is also increasing day by day. As the use of energy resources has reached a significant level today, environmental pollution, greenhouse gas emissions, and the resulting climate change, along with the limited capacity of raw materials and energy sources, have led people to seek alternative energy sources.

Renewable energy sources are becoming increasingly important due to their low cost, minimal environmental impact, and very low levels of greenhouse gas emissions. These renewable energy sources include solar, wind, geothermal, and biomass energy.

Biomass is an energy source derived from all natural materials of non-fossil origin, including plant- and animal-based matter. The most important characteristics of biomass are its environmental friendliness and sustainability.

Biodiesel is a biomass-derived energy source in liquid form. It is obtained through processing oils derived from oilseed crops as well as used cooking oils.

This study examines the production quantities and cultivation areas of vegetable oils used in biodiesel production, along with the import and export statistics of these products in Turkey. Based on these data, the potential of biodiesel production and its evaluation have been assessed.

1 Tokat Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, Turkey

2 Prof. Dr., Tokat Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, Turkey