



KEY WORDS

- ✓ Shape Analysis
- ✓ Landmark
- ✓ PANOVA
- ✓ DISCO
- ✓ Minimum Lambda

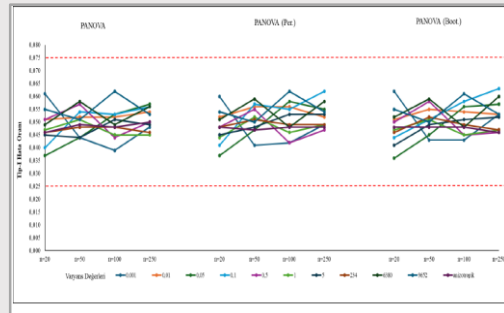
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COMPARISON OF THE PERFORMANCE OF k-SAMPLE TEST METHODS IN STATISTICAL SHAPE ANALYSIS

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THESIS ABSTRACT

The performance of Procrustes ANOVA, Minimum Lambda (λ_{min}), and the permutation and bootstrap versions of the DISCO test in maintaining Type-I error control for k independent samples in statistical shape analysis has been examined. The tests were compared using simulation scenarios constructed under varying sample sizes, different numbers of groups, different values in the variance-covariance matrix, and both isotropic and anisotropic data structures. Based on the results obtained, Procrustes ANOVA and DISCO-based tests are recommended as statistically more reliable and robust alternatives when distributional assumptions are violated.

APPLICATION AREAS OF THE THESIS RESULTS

In applied statistical research, particularly in multi-group shape comparisons conducted in the fields of medicine, biology, and anthropology, the use of alternative testing methods when distributional assumptions are violated will be appropriate for obtaining more reliable results.

ACADEMIC ACTIVITIES

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