Web Application For Identifying and Diagnosing Performance Anomalies

Kyra Terez[1,2], Efe Sencan[2], Prof. Ayse K. Coskun[2]

[1]Travis High School, 11111 Harlem Road, Richmond, TX 774061;

[2]Department of Electrical and Computer Engineering, Boston University, 8 St. Mary's Street, Boston, MA 02215

Introduction

- High Performance Computing (HPC) Systems encounter performance variations
- Machine learning frameworks have been developed
  - Detects performance anomalies on compute nodes
  - Complex for HPC system users
- Created a web application for users using a machine learning framework
  - Flask micro-web framework
  - Gives HPC system users results from detecting performance anomalies
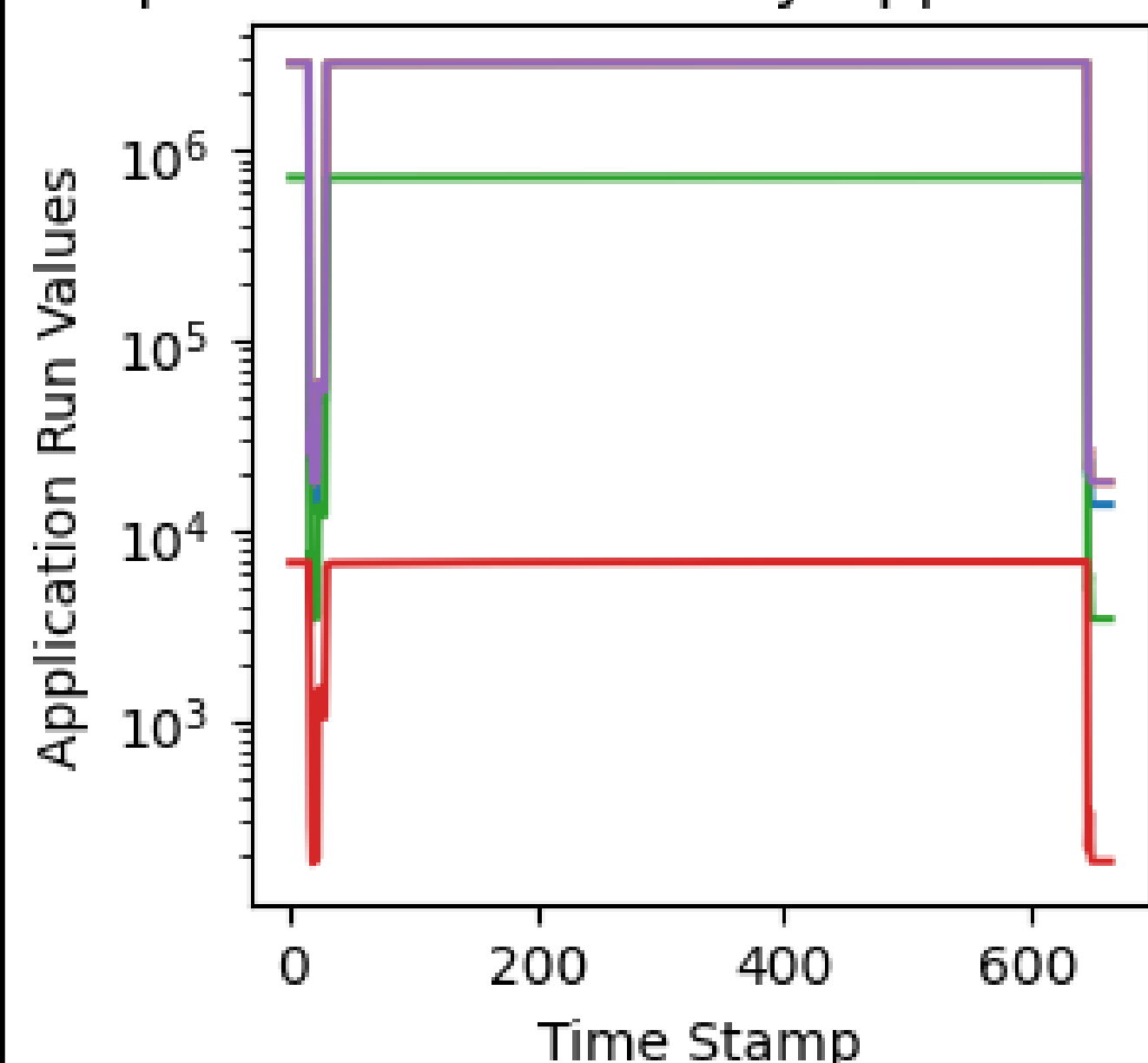 - Using anomaly types: memeater, dcopy, leak, dial

Results

The application displays overall information about the application run and drill-down application run analysis
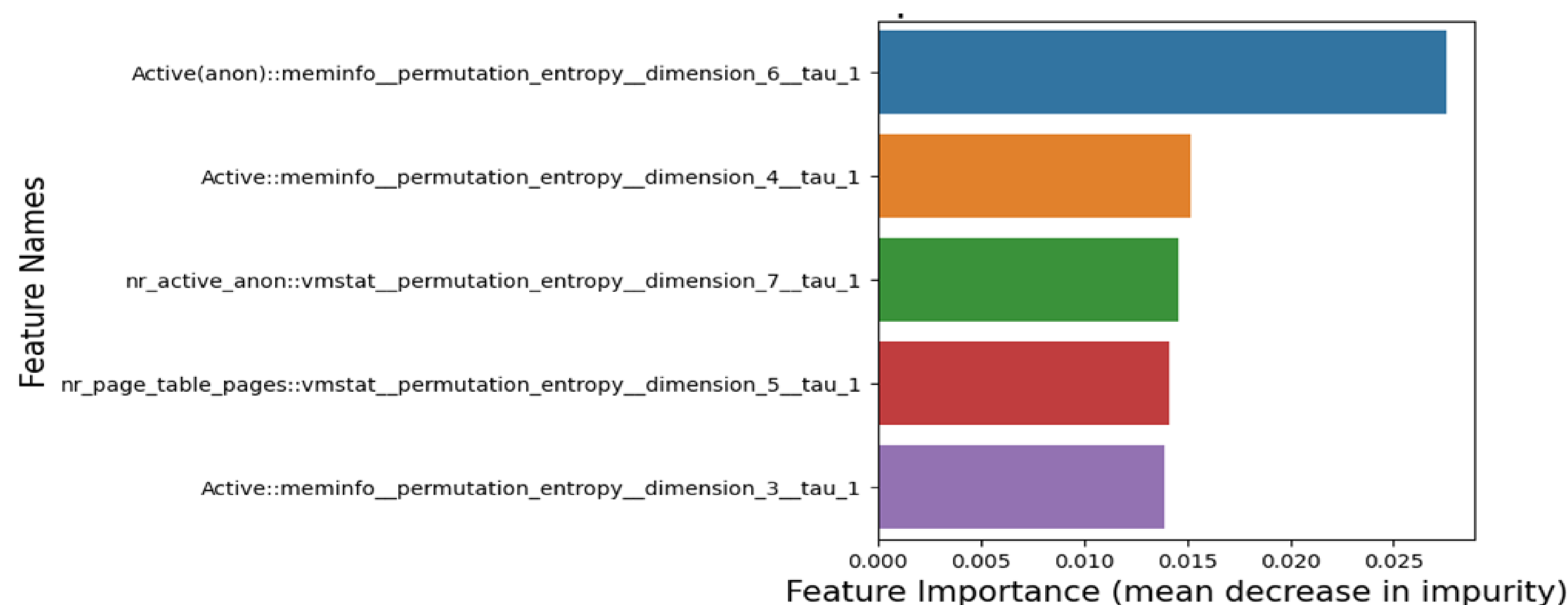
Top feature importance scores from model training displayed in overall results
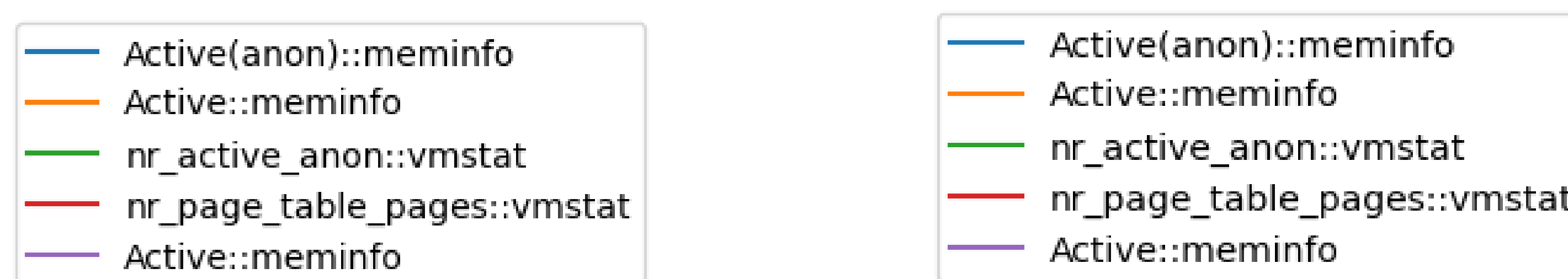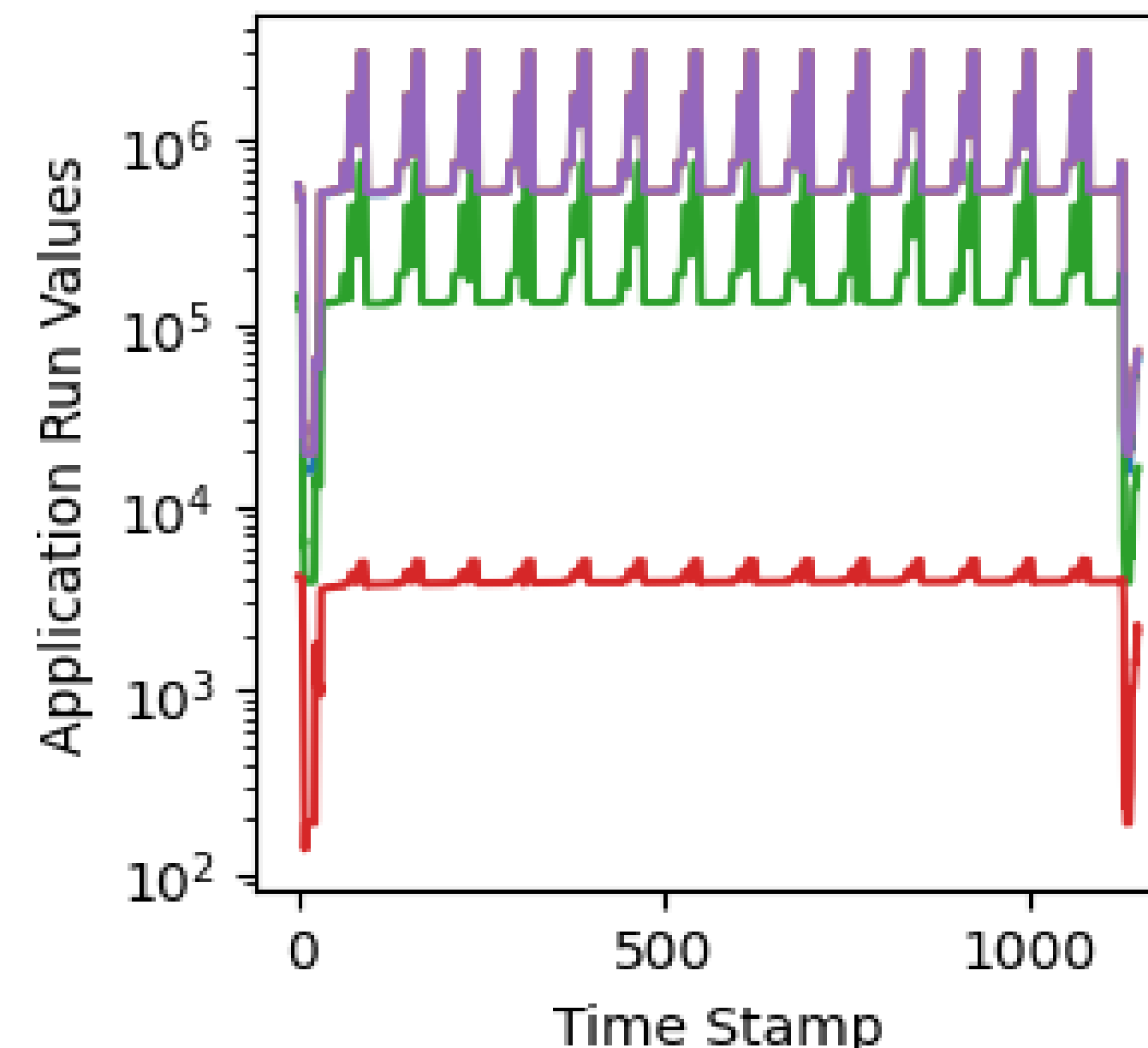

Telemetry data for sample healthy application run based on the feature importance scores

Telemetry data for specific application run with dcopy anomaly type

Discussion/ Conclusions

- HPC system users should understand the compute node anomalies within their system
- This allows them to make system adjustments to account for performance variations
- The web application creates different components that allow users to obtain this understanding
  - Users can see the feature importance scores
  - Users can compare the sample healthy application run's telemetry data to the anomalous run's data

Methodology
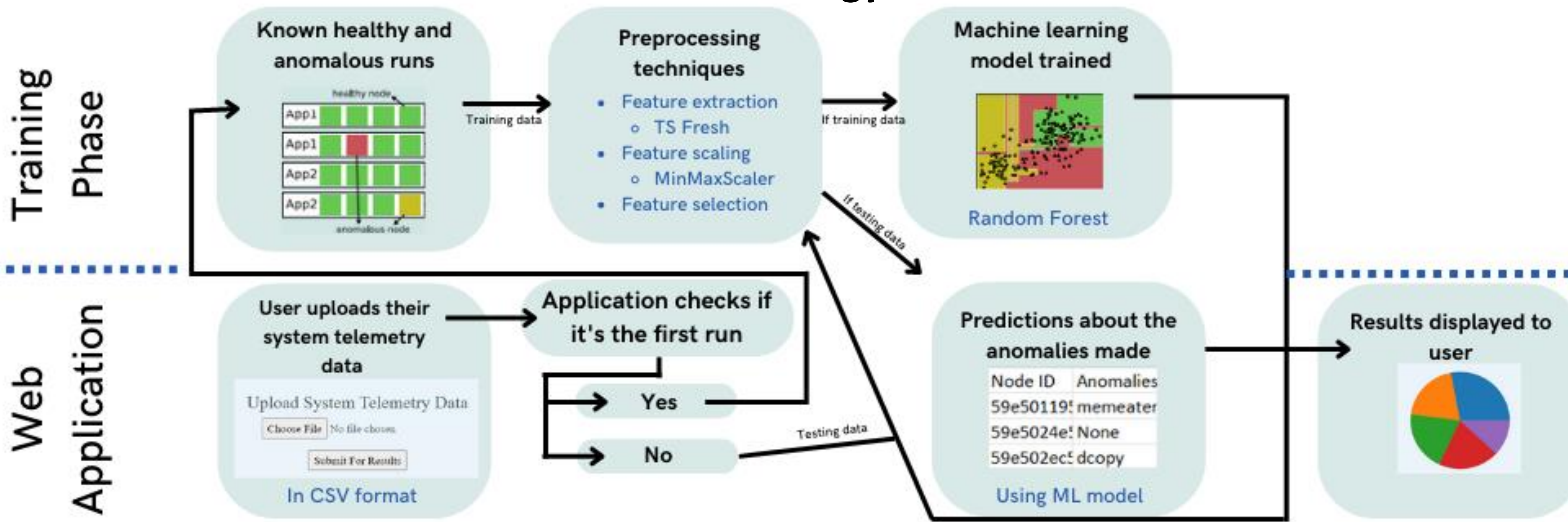
References

[1] Tuncer, O.; Ates, E.; Zhang, Y.; Turk, A.; Brandt, J.; Leung, V. J.; Egele, M.; Coskun, A. K. Online Diagnosis of Performance Variation in HPC Systems Using Machine Learning. *IEEE Transactions on Parallel and Distributed Systems* **2019**, *30* (4), 883–896.

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