

Data Loading & Preprocessing – Large-scale soccer player statistics are loaded, cleaned, and prepared for analysis.



Normalization & Feature Weighting – The dataset is standardized, and key attributes are weighted to enhance relevant patterns.



Autoencoder Training & Dimensional Expansion – A deep learning autoencoder is trained to learn a compressed representation, then expands the feature space for richer data encoding.



Principal Component Analysis (PCA) – The expanded feature set undergoes PCA, reducing dimensions while preserving critical variance.



Visualization & Clustering – The PCA-transformed data is projected into a 2D space, with players color-coded based on attributes like position and nationality.



Comparative Analysis & Insights – Players with significant statistical differences are compared, and clustering patterns are examined to uncover hidden trends.