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| **Acronym** | **Description** |
| ANFIS | Adaptive Neural network-based Fuzzy Inference System |
| ANN | Artificial Neural Networks |
| AR | Autoregressive |
| ARMA | Autoregressive Moving Average model |
| BBI | Ballast Breakage Index |
| CAR | Conditional Autoregressive |
| CART | Classification and Regression Tree method |
| DEM | Discrete Element Method |
| DSS | Decision Support System |
| EMGT | Equivalent Million Gross Tons |
| FCM | Fuzzy C-Means |
| FE | Finite Element |
| FIS | Fuzzy Inference System |
| GM(s) | Grey box Model(s) |
| IG | Inverse Gaussian |
| IM | Infrastructure Manager |
| KPI | Key Performance Indicator |
| LCC | Life Cycle Costs |
| M&R | Maintenance and Renewal |
| MCMC | Markov Chain Monte Carlo |
| MCS | Monte Carlo Simulation |
| MLP(s) | Multilayer perceptron(s) |
| MPE | Mean Percentage Error |
| MSE | Mean Squared Error |
| MVA | Multivariate Analysis |
| PN | Petri Nets |
| PSD | Power Spectral Density |
| SD | Standard Deviation |
| SFE | Stochastic Finite Element method |
| SVM | Support Vector Machines |
| TAN-TQI | Bayes-track Quality Index |
| TGC | Track Geometry Car |
| TQI | Track Quality Index |
| USP(s) | Under Sleeper Pad(s) |
| VTI | Vehicle-track Interaction |

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| **Symbol** | **Definition** |
| $$D\_{f}$$ | Deterioration factor |
| $$E\_{s}$$ | Young’s modulus of the subgrade |
| $$F\_{y}$$ | Yield force |
| $$S\_{1}$$ | Settlement at the end of the first load application |
| $$S\_{N}$$ | Accumulated settlement |
| $$k\_{s}$$ | Reaction modulus |
| $$p^{’}$$ | Mean effective stress |
| $$q\_{f}$$ | Deviatoric stress at failure |
| $$q\_{max}$$ | Maximum deviatoric stress |
| $$s\_{N}$$ | Settlement rate |
| $$s\_{u}$$ | Ultimate stress |
| $$s\_{y}$$ | Yield stress |
| $$ε\_{1}$$ | Strain at the end of the first load application |
| $$ε\_{Ν}$$ | Strain |
| $$σ\_{u}$$ | Ultimate (failure) vertical stress |
| $$σ\_{y}$$ | Yield stress |
| $$H$$ | Hardening stiffness |
| $$N$$ | Number of load cycles/Load cycle |
| $$T$$ | Variation track stiffness |
| $$q$$ | Deviatoric stress |