Small Sample Sizes

📊 Statistical Power Challenge

Limited samples reduce ability to detect true effects and increase risk of false discoveries

🔄 Cross-validation

K-fold, stratified, leave-one-out strategies for robust evaluation

👢 Bootstrap Methods

Resampling techniques to estimate uncertainty and confidence intervals

🎨 Data Augmentation

Generate synthetic samples while preserving statistical properties

🔀 Transfer Learning

Leverage pre-trained models from larger datasets or related domains

Regularization

Penalize model complexity to prevent overfitting on small datasets

Domain Priors

Incorporate biological knowledge to guide model learning