# (a) Pre-training Data Generation

Model setup — PartMC-MOSAIC — Model output

90% Training group

5% Validation group

5% Testing group
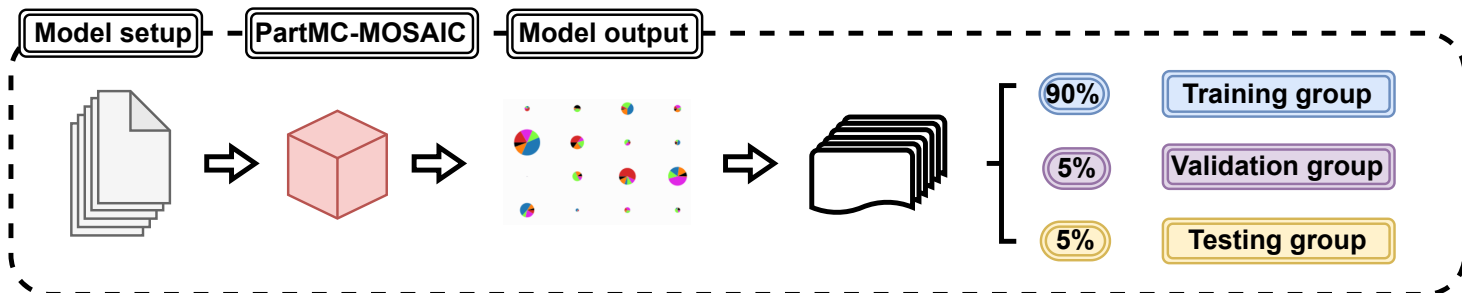
(b) Foundation Model Development

Training group

Hyperparameter Optimization

Input layer   Hidden layers   Output layer

Validation group

Pick the best model

R^2 MAPE   RMSE   MAE

Test the best model performance

Testing group

The foundation model
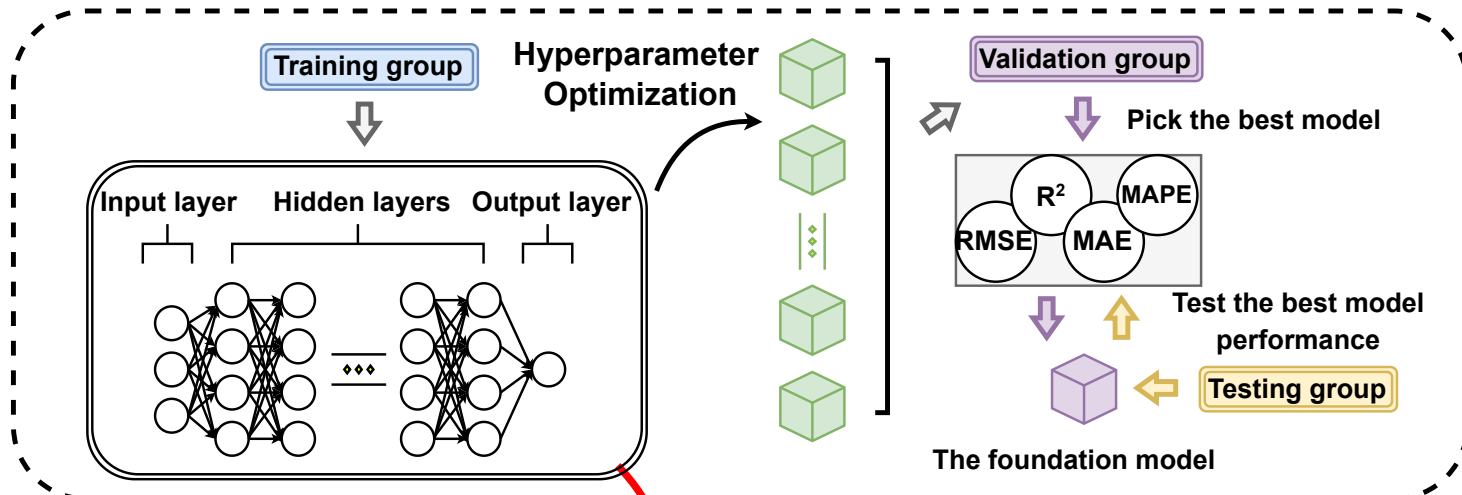
(c) Foundation Model Architecture

Input layer   Hidden layers   Output layer

Residual Block

Input

Linear transform + Activation function

Linear transform + Activation function

Linear transform

$+$

Activation function

Linear output
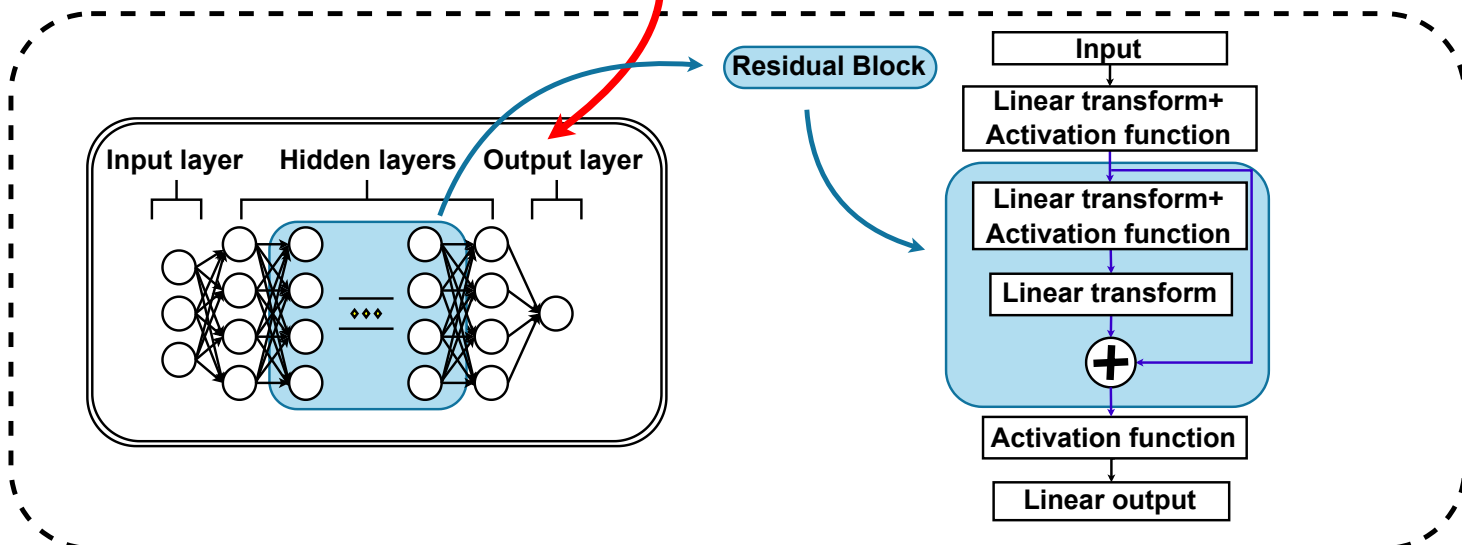
(d) Foundation Model Fine-tuning

Observational data split

Fine-tuning

50%   50%

Training group   Testing group

Time series observational data

Training group Data Size - 195

Testing group Data Size - 195

The foundation model

The new model

Process-guided knowledge