多模型报告2

训练模型：

1. KNN回归模型

1.1 参数

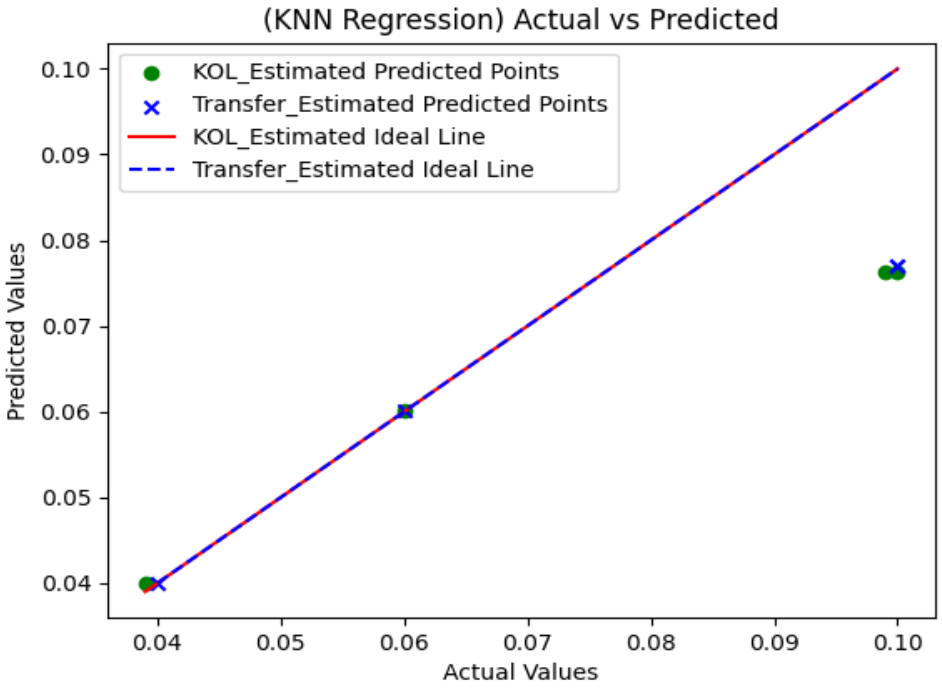
原始模型参数:
{'algorithm': 'auto', 'leaf_size': 30, 'metric': 'minkowski', 'metric_params': None, 'n_jobs': None, 'n_neighbors': 5, 'p': 2, 'weights': 'uniform'}

调参后模型参数:
{'algorithm': 'auto', 'leaf_size': 1, 'metric': 'minkowski', 'metric_params': None, 'n_jobs': None, 'n_neighbors': 5, 'p': 4, 'weights': 'distance'}

1.2 模型评分

原始模型评分: 0.41393605292172003
调参后模型评分: 0.604288437927436

1.3 模型预测结果可视化



2. 随机森林回归模型

2.1 参数

原始模型参数:

{'bootstrap': True, 'ccp_alpha': 0.0, 'criterion': 'squared_error', 'max_depth': None, 'max_features': 1.0, 'max_leaf_nodes': None, 'max_samples': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 100, 'n_jobs': None, 'oob_score': False, 'random_state': 42, 'verbose': 0, 'warm_start': False}

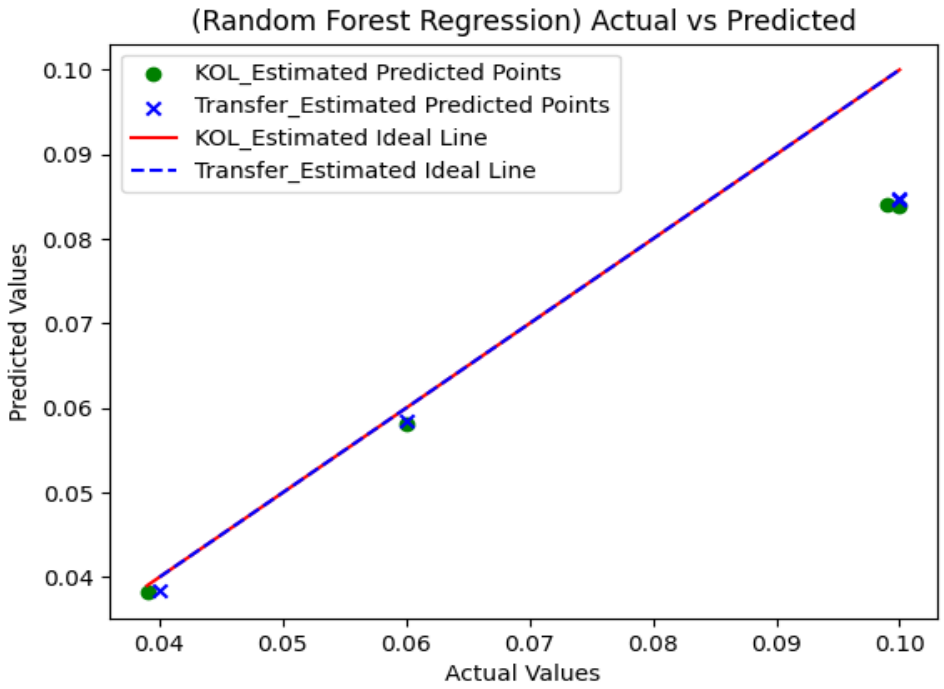
调参后模型参数:

{'bootstrap': True, 'ccp_alpha': 0.0, 'criterion': 'squared_error', 'max_depth': 80, 'max_features': 6, 'max_leaf_nodes': None, 'max_samples': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 1400, 'n_jobs': None, 'oob_score': False, 'random_state': None, 'verbose': 0, 'warm_start': False}

2.2 模型评分

原始模型评分: 0.8125992608926446
调参后模型评分: 0.8246009175402012

2.3 模型预测结果可视化



3. Adaboost回归_KOL_Estimated模型

3.1 参数

原始模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'squared_error', 'base_estimator__max_depth': 4, 'base_estimator__max_features': None, 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 2, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(max_depth=4), 'learning_rate': 1.0, 'loss': 'linear', 'n_estimators': 100, 'random_state': 42}

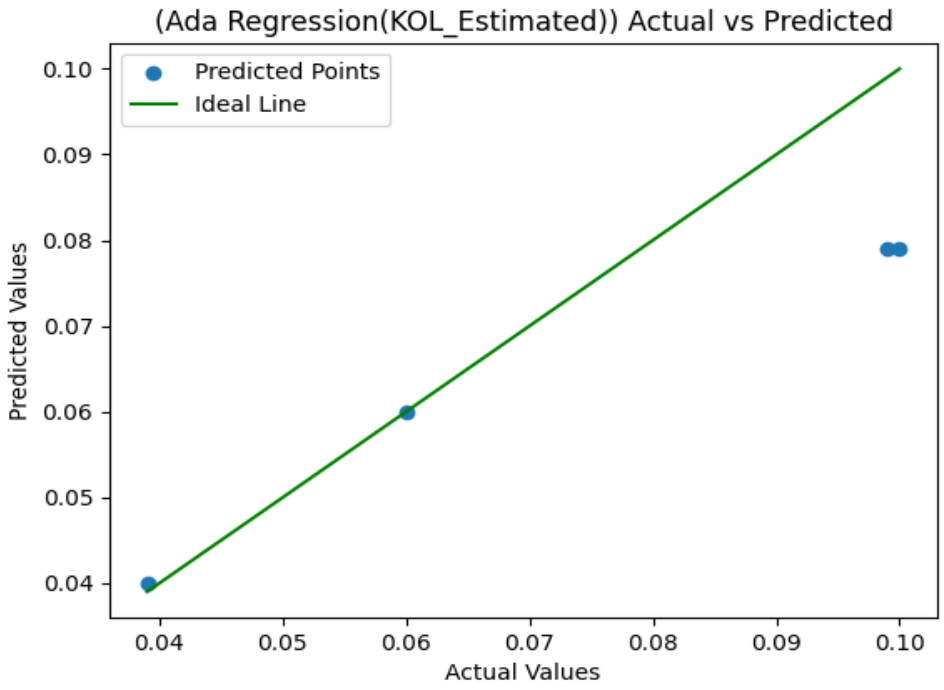
调参后模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'absolute_error', 'base_estimator__max_depth': 3, 'base_estimator__max_features': None, 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 5, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(criterion='absolute_error', max_depth=3, min_samples_split=5), 'learning_rate': 1, 'loss': 'exponential', 'n_estimators': 150, 'random_state': 42}

3.2 模型评分

原始模型评分: 0.6905549430356486
调参后模型评分: 0.6905549430356486

3.3 模型预测结果可视化



4. Adaboost回归_Transfer_Estimated模型

4.1 参数

原始模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'squared_error', 'base_estimator__max_depth': 4, 'base_estimator__max_features': None, 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 2, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(max_depth=4), 'learning_rate': 1.0, 'loss': 'linear', 'n_estimators': 100, 'random_state': 42}

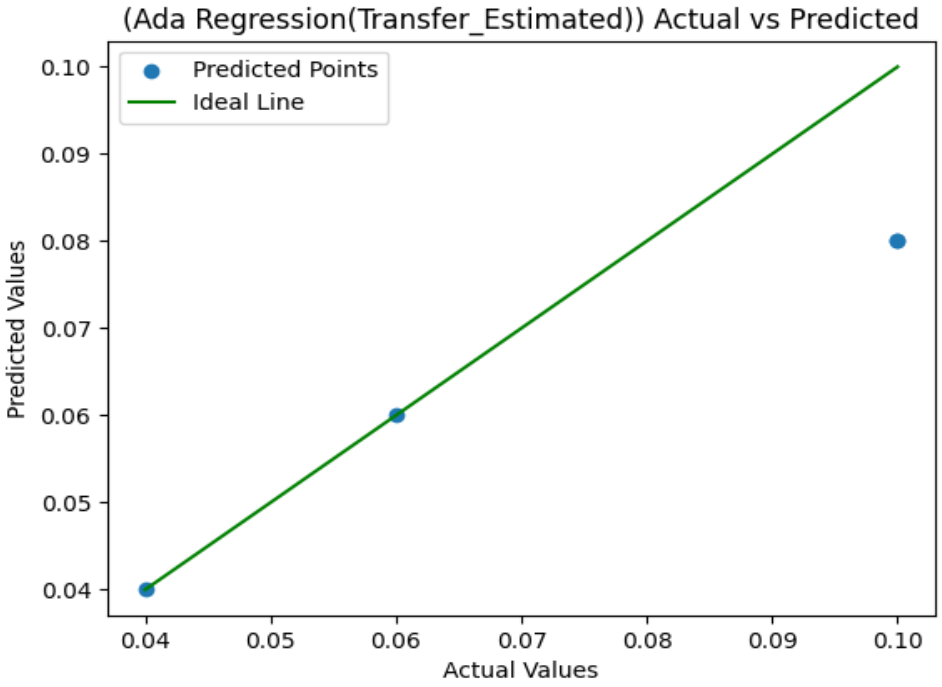
调参后模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'squared_error', 'base_estimator__max_depth': 3, 'base_estimator__max_features': 'sqrt', 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 2, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(max_depth=3, max_features='sqrt'), 'learning_rate': 1, 'loss': 'linear', 'n_estimators': 50, 'random_state': 42}

4.2 模型评分

原始模型评分: 0.7037037037037036
调参后模型评分: 0.7037037037037036

4.3 模型预测结果可视化



5. GBRT回归_KOL_Estimated模型

5.1 参数

原始模型参数:

{'alpha': 0.9, 'ccp_alpha': 0.0, 'criterion': 'friedman_mse', 'init': None, 'learning_rate': 0.1, 'loss': 'squared_error', 'max_depth': 3, 'max_features': None, 'max_leaf_nodes': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 100, 'n_iter_no_change': None, 'random_state': 42, 'subsample': 1.0, 'tol': 0.0001, 'validation_fraction': 0.1, 'verbose': 0, 'warm_start': False}

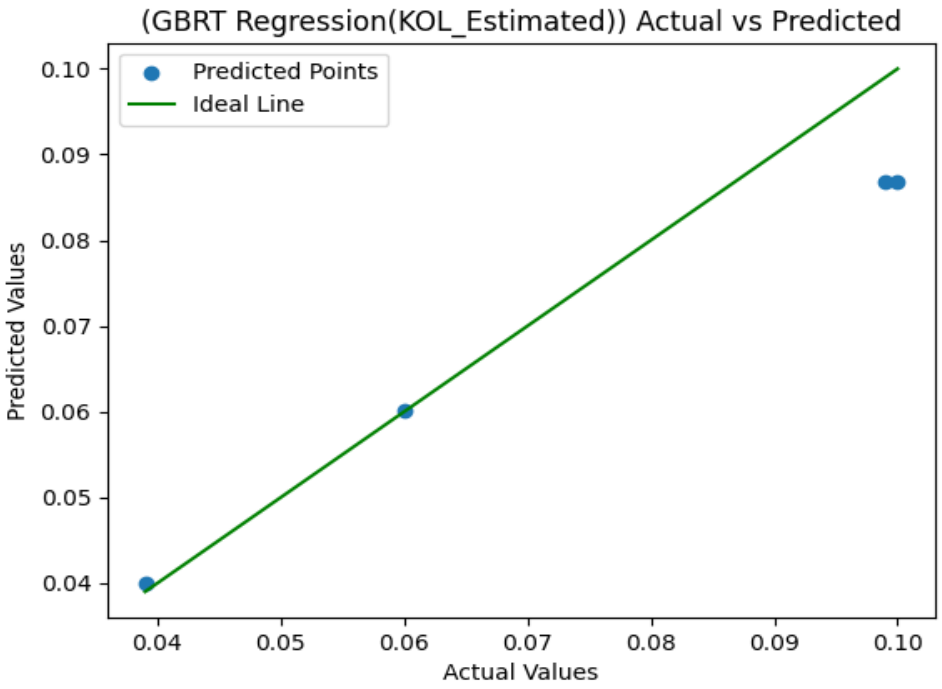
调参后模型参数:

{'alpha': 0.5, 'ccp_alpha': 0.0, 'criterion': 'squared_error', 'init': None, 'learning_rate': 0.1, 'loss': 'squared_error', 'max_depth': 3, 'max_features': 'sqrt', 'max_leaf_nodes': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 200, 'n_iter_no_change': None, 'random_state': 42, 'subsample': 1.0, 'tol': 0.0001, 'validation_fraction': 0.1, 'verbose': 0, 'warm_start': False}

5.2 模型评分

原始模型评分: 0.863282951648415
调参后模型评分: 0.8815930783210573

5.3 模型预测结果可视化



6. GBRT回归_Transfer_Estimated模型

6.1 参数

原始模型参数:

{'alpha': 0.9, 'ccp_alpha': 0.0, 'criterion': 'friedman_mse', 'init': None, 'learning_rate': 0.1, 'loss': 'squared_error', 'max_depth': 3, 'max_features': None, 'max_leaf_nodes': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 100, 'n_iter_no_change': None, 'random_state': 42, 'subsample': 1.0, 'tol': 0.0001, 'validation_fraction': 0.1, 'verbose': 0, 'warm_start': False}

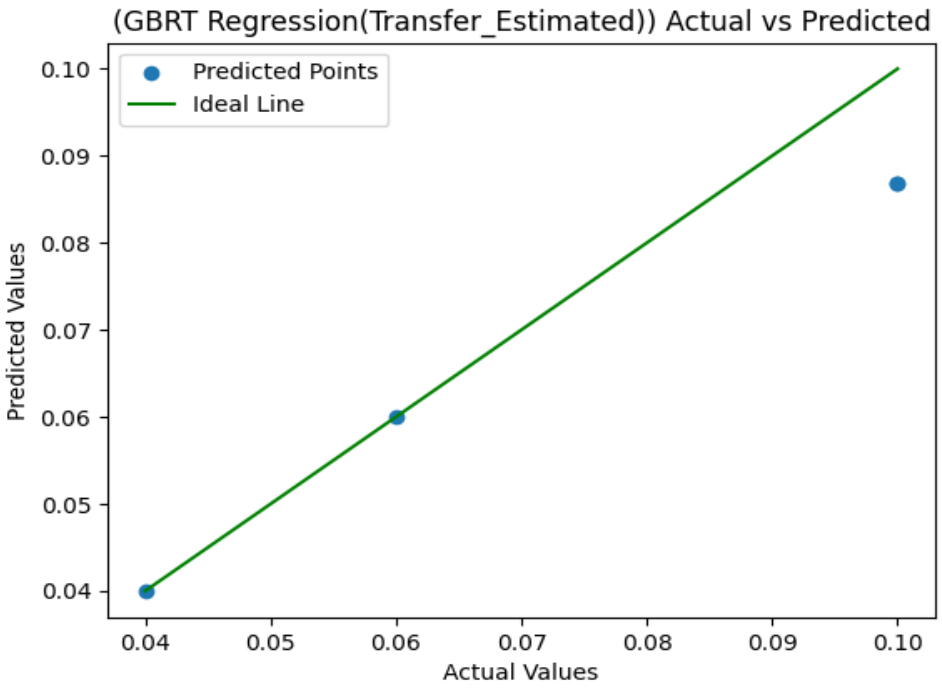
调参后模型参数:

{'alpha': 0.4, 'ccp_alpha': 0.0, 'criterion': 'squared_error', 'init': None, 'learning_rate': 0.1, 'loss': 'squared_error', 'max_depth': 3, 'max_features': 'sqrt', 'max_leaf_nodes': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 200, 'n_iter_no_change': None, 'random_state': 42, 'subsample': 1.0, 'tol': 0.0001, 'validation_fraction': 0.1, 'verbose': 0, 'warm_start': False}

6.2 模型评分

原始模型评分: 0.8219862059134245
调参后模型评分: 0.8716275515156842

6.3 模型预测结果可视化



7. Bagging回归模型

7.1 参数

原始模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'squared_error', 'base_estimator__max_depth': None, 'base_estimator__max_features': None, 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 2, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(), 'bootstrap': True, 'bootstrap_features': False, 'max_features': 1.0, 'max_samples': 1.0, 'n_estimators': 10, 'n_jobs': None, 'oob_score': False, 'random_state': 42, 'verbose': 0, 'warm_start': False}

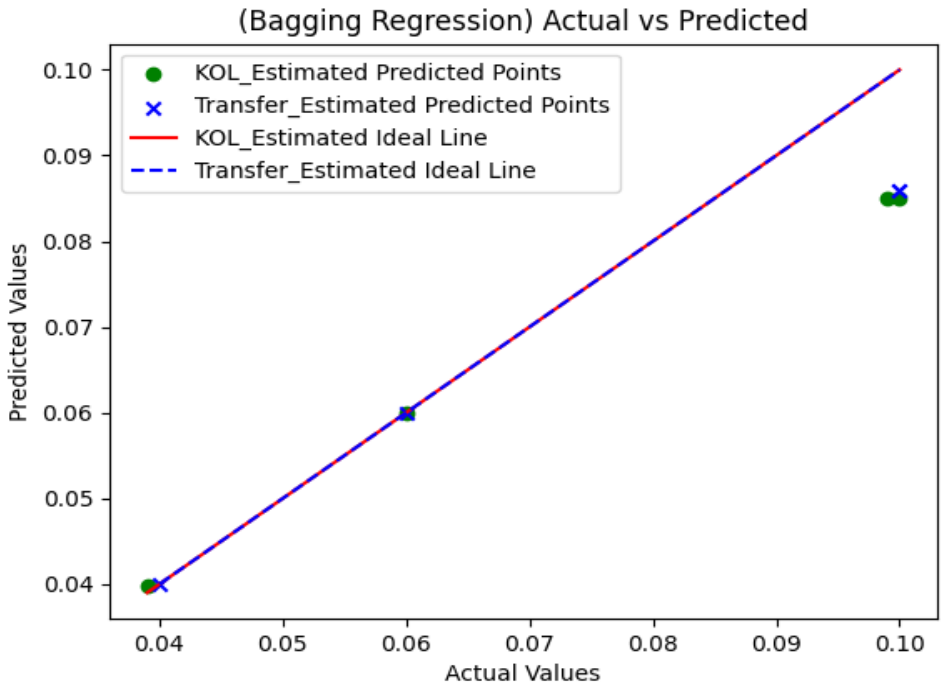
调参后模型参数:

{'base_estimator__ccp_alpha': 0.0, 'base_estimator__criterion': 'absolute_error', 'base_estimator__max_depth': None, 'base_estimator__max_features': None, 'base_estimator__max_leaf_nodes': None, 'base_estimator__min_impurity_decrease': 0.0, 'base_estimator__min_samples_leaf': 1, 'base_estimator__min_samples_split': 2, 'base_estimator__min_weight_fraction_leaf': 0.0, 'base_estimator__random_state': None, 'base_estimator__splitter': 'best', 'base_estimator': DecisionTreeRegressor(criterion='absolute_error'), 'bootstrap': False, 'bootstrap_features': True, 'max_features': 0.7, 'max_samples': 1.0, 'n_estimators': 250, 'n_jobs': None, 'oob_score': False, 'random_state': 42, 'verbose': 0, 'warm_start': False}

7.2 模型评分

原始模型评分: 0.8253219812977252
调参后模型评分: 0.8549686791620734

7.3 模型预测结果可视化



8. ExtraTree回归模型

8.1 参数

原始模型参数:

{'bootstrap': False, 'ccp_alpha': 0.0, 'criterion': 'squared_error', 'max_depth': None, 'max_features': 1.0, 'max_leaf_nodes': None, 'max_samples': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 100, 'n_jobs': None, 'oob_score': False, 'random_state': 42, 'verbose': 0, 'warm_start': False}

调参后模型参数:

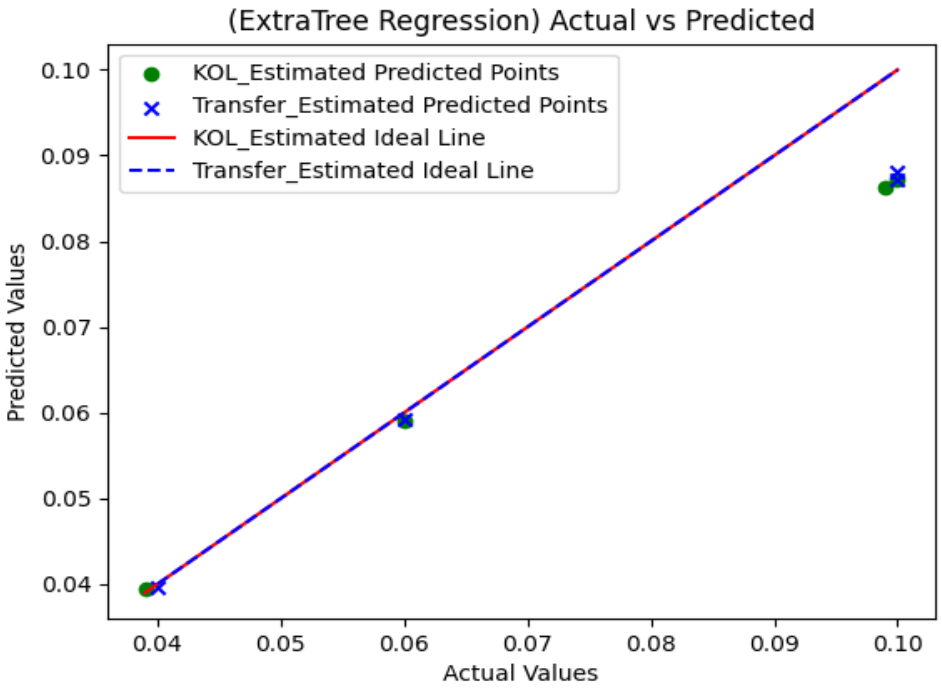
{'bootstrap': False, 'ccp_alpha': 0.0, 'criterion': 'absolute_error', 'max_depth': None, 'max_features': 1.0, 'max_leaf_nodes': None, 'max_samples': None, 'min_impurity_decrease': 0.0, 'min_samples_leaf': 1, 'min_samples_split': 2, 'min_weight_fraction_leaf': 0.0, 'n_estimators': 150, 'n_jobs': None, 'oob_score': False, 'random_state': 42, 'verbose': 0, 'warm_start': False}

8.2 模型评分

原始模型评分: 0.8778783025031645

调参后模型评分: 0.9043417570700685

8.3 模型预测结果可视化



平均均方误差与均方误差汇总

	调参前平均均方误差	调参后平均均方误差	调参前均方误差 KOL_Estimated	调参后均方误差 KOL_Estimated	调参前均方误差 Transfer_Estimated	调参后均方误差 Transfer_Estimated
KNN 回归	2.01082000e-04	1.87014675e-04	3.98260000e-04	2.70907502e-04	3.96000000e-04	2.65393904e-04
随机森林回归	1.69363250e-04	1.60899686e-04	1.29681850e-04	1.28215397e-04	1.24310000e-04	1.23266133e-04
Adaboost回归_KOL_Estimated	2.34550000e-04	2.74600000e-04	2.10500000e-04	2.10500000e-04	nan	nan
Adaboost回归_Transfer_Estimated	5.60000000e-04	4.60000000e-04	nan	nan	2.00000000e-04	2.00000000e-04
GBRT回归_KOL_Estimated	1.47088031e-04	1.34997491e-04	9.30017721e-05	8.05463085e-05	nan	nan
GBRT回归_Transfer_Estimated	1.06809344e-04	1.25917124e-04	nan	nan	1.20159311e-04	8.66514027e-05
Bagging回归	2.37263250e-04	1.85892568e-04	1.21755000e-04	1.04650850e-04	1.15000000e-04	9.80000000e-05
ExtraTree回归	1.04306660e-04	9.52786500e-05	8.54437250e-05	8.21942000e-05	8.00800000e-05	7.71600000e-05

模型评分汇总

	训练前评分	训练后评分
KNN 回归	4.13936053e-01	6.04288438e-01
随机森林回归	8.12599261e-01	8.14217035e-01
Adaboost回归_KOL_Estimated	6.90554943e-01	6.90554943e-01
Adaboost回归_Transfer_Estimated	7.03703704e-01	7.03703704e-01
GBRT回归_KOL_Estimated	8.63282952e-01	8.81593078e-01
GBRT回归_Transfer_Estimated	8.21986206e-01	8.71627552e-01
Bagging回归	8.25321981e-01	8.54968679e-01
ExtraTree回归	8.77878303e-01	9.04341757e-01

模型选择结论：

ExtraTree回归模型是最适合的模型。