**< PE imputation using linear regression >**

Cross Validation

하나의 well을 test well로 두고 나머지 well로 train 하여 accuracy 측정

|  |  |
| --- | --- |
| Well Name | Accuracy |
| CHURCHMAN BIBLE | 0.5022892 |
| CROSS H CATTLE | 0.7243607 |
| LUKE G U | 0.5321503 |
| NEWBY | 0.371209 |
| NOLAN | 0.5028316 |
| SHANKLE | 0.5645484 |
| SHRIMPLIN | 0.2778908 |
| Average | 0.4964686 |



**< PE imputation using MLP >**

Cross Validation

Grid Search (Hidden layer sizes / Max Iter )

* MLP1





* MLP2





* MLP3





* MLP4 (Robust scaling)





* MLP5 (Robust scaling)





* MLP6 (**MSE**)



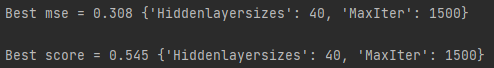


같은 parameter로 여러 번 반복





* MLP7



같은 parameter로 여러 번 반복







**< LSTM >**

1. Lstm\_output\_num = 10 / Epoch = 50 / batch\_size = 10



2. Lstm\_output\_num = 30 / Epoch = 70 / batch\_size = 10 / earlystopping (patience=5)



3. Lstm\_output\_num = 50 / Epoch = 500 / batch\_size = 5 / earlystopping (patience=10)



4. Lstm\_output\_num = 25 / Epoch = 100 / batch\_size = 8 / earlystopping (patience=7, verbose=1)



5. Gridsearch (Lstm\_output\_num = [10, 20, 30], batch\_size = [8,10,20], Epoch = 150 (earlystopping))

Best mse = 0.292 {'LON': 20, 'BS': 8, 'DR': 0.0, 'LR': 0.001}

Best R2 = 0.559 {'LON': 20, 'BS': 8, 'DR': 0.0, 'LR': 0.001}

LSTM2

|  |  |  |
| --- | --- | --- |
| Well Name | R2 | MSE |
| CHURCHMAN BIBLE | 0.5643 | 0.5189 |
| CROSS H CATTLE | 0.7063 | 0.1342 |
| LUKE G U | 0.6266 | 0.1971 |
| NEWBY | 0.3487 | 0.1791 |
| NOLAN | 0.5599 | 0.3382 |
| SHANKLE | 0.5524 | 0.2396 |
| SHRIMPLIN | 0.3842 | 0.5009 |
| Average | **0.5346** | 0.3011 |

**< LR by facies >**

facies별로 데이터를 나누고 각 데이터에서 train, test 8:2로 랜덤하게 나누어 test data에서의 MSE 평균 측정

(R2는 랜덤하게 추출했기 때문에 의미가 없지 않을까?)







