Test result for 20mm:

MAE 0.009012538

MSE 0.00012531392

RMSE 0.01119437

R2 0.939611008422347

Test Result for 15mm

MAE 0.013676002

MSE 0.00041162246

RMSE 0.02028848

R2 0.9554840443753447

Test Result for 10mm

MAE 0.022519358

MSE 0.0010839341

RMSE 0.032923155

R2 0.9741128520764973

Test Result for 5mm

MAE 0.10536194

MSE 0.03019165

RMSE 0.17375745

R2 0.9501904112375013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MAE | MSE | RMSE | R2 |
| 5mm | 0.105361 | 0.030191 | 0.173757 | 0.950190 |
| 10mm | 0.022519 | 0.001084 | 0.032923 | 0.974112 |
| 15mm | 0.013676 | 0.000411 | 0.020288 | 0.955484 |
| 20mm | 0.009012 | 0.000125 | 0.011194 | 0.939611 |

Compare Test with Validation

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | MAE | | MSE | | RMSE | | R2 | |
|  | Test | Validation | Test | Validation | Test | Validation | Test | Validation |
| 5mm | 0.105361 | 0.104473 | 0.030191 | 0.031402 | 0.173757 | 0.177202 | 0.950190 | 0.949373 |
| 10mm | 0.022519 | 0.027176 | 0.001084 | 0.001818 | 0.032923 | 0.042635 | 0.974112 | 0.957927 |
| 15mm | 0.013676 | 0.017804 | 0.000411 | 0.000560 | 0.020288 | 0.023674 | 0.955484 | 0.928461 |
| 20mm | 0.009012 | 0.008112 | 0.000125 | 0.000121 | 0.011194 | 0.010994 | 0.939611 | 0.950547 |

MAE 0.023371596

MSE 0.001157425

RMSE 0.03402095

R2 0.9723576991051891

Compare Result

For 5mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MAE | MSE | RMSE | R2 |
| LSTM | 0.3067 | 0.1580 | 0.3963 | 0.9140 |
| SVM | 0.4569 | 0.3637 | 0.6005 | 0.8036 |
| GRU | 0.2566 | 0.1544 | 0.3930 | 0.9228 |
| CNN | 0.1053 | 0.0301 | 0.1737 | 0.9501 |

For 10mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MAE | MSE | RMSE | R2 |
| LSTM | 0.3002 | 0.1596 | 0.3981 | 0.8921 |
| SVM | 0.3592 | 0.2206 | 0.4688 | 0.8518 |
| GRU | 0.2573 | 0.1476 | 0.3842 | 0.9123 |
| CNN | 0.0225 | 0.0010 | 0.0329 | 0.9741 |

For 15mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MAE | MSE | RMSE | R2 |
| LSTM | 0.3129 | 0.1664 | 0.4071 | 0.8750 |
| SVM | 0.3239 | 0.1784 | 0.4215 | 0.8668 |
| GRU | 0.2613 | 0.1455 | 0.3814 | 0.9015 |
| CNN | 0.0136 | 0.0004 | 0.0202 | 0.9554 |

For 20mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MAE | MSE | RMSE | R2 |
| LSTM | 0.3028 | 0.1640 | 0.4043 | 0.8751 |
| SVM | 0.2925 | 0.1452 | 0.3796 | 0.8899 |
| GRU | 0.2957 | 0.1747 | 0.4179 | 0.8609 |
| CNN | 0.0090 | 0.0001 | 0.0111 | 0.9396 |

MAE:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 5mm | 10mm | 15mm | 20mm |
| LSTM | 0.3067 | 0.3002 | 0.3129 | 0.3028 |
| SVM | 0.4569 | 0.3592 | 0.3239 | 0.2925 |
| GRU | 0.2566 | 0.2573 | 0.2613 | 0.2957 |
| CNN | 0.1053 | 0.0225 | 0.0136 | 0.0090 |

MSE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 5mm | 10mm | 15mm | 20mm |
| LSTM | 0.1580 | 0.1596 | 0.1664 | 0.1640 |
| SVM | 0.3637 | 0.2206 | 0.1784 | 0.1452 |
| GRU | 0.1544 | 0.1476 | 0.1455 | 0.1747 |
| CNN | 0.0301 | 0.0010 | 0.0004 | 0.0001 |

RMSE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 5mm | 10mm | 15mm | 20mm |
| LSTM | 0.3963 | 0.3981 | 0.4071 | 0.4043 |
| SVM | 0.6005 | 0.4688 | 0.4215 | 0.3796 |
| GRU | 0.3930 | 0.3842 | 0.3814 | 0.4179 |
| CNN | 0.1737 | 0.0329 | 0.0202 | 0.0111 |

R2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 5mm | 10mm | 15mm | 20mm |
| LSTM | 0.9140 | 0.8921 | 0.8750 | 0.8751 |
| SVM | 0.8036 | 0.8518 | 0.8668 | 0.8899 |
| GRU | 0.9228 | 0.9123 | 0.9015 | 0.8609 |
| CNN | 0.9501 | 0.9741 | 0.9554 | 0.9396 |

Validation for 5mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fold | MAE | MSE | RMSE | R2 |
| 1 | 0.104361095 | 0.031411353 | 0.17723249 | 0.9493592940161799 |
| 2 | 0.101767786 | 0.031216087 | 0.17668074 | 0.9496740981404409 |
| 3 | 0.10368886 | 0.031244084 | 0.17675996 | 0.9496289607253967 |
| 4 | 0.104218155 | 0.03152024 | 0.17753941 | 0.9491837567747562 |
| 5 | 0.105652615 | 0.031403773 | 0.17721109 | 0.949371516989027 |
| 6 | 0.10400997 | 0.031106435 | 0.17637016 | 0.9498508782447367 |
| 7 | 0.10952458 | 0.03251418 | 0.1803169 | 0.9475813429995984 |
| 8 | 0.100924365 | 0.031725604 | 0.17811683 | 0.9488502034719193 |
| 9 | 0.10291215 | 0.03076978 | 0.17541318 | 0.950391234220445 |
| 10 | 0.107671745 | 0.031110736 | 0.17638236 | 0.9498415322869636 |
| Average | 0.1044731321 | 0.0314022272 | 0.177202312 | 0.9493732817869466 |
| Standard Deviation | 0.0008191859668137828 | 0.00014859083741385604 | 0.0004174676114989847 | 0.00023944891141408116 |

Validation for 10mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fold | MAE | MSE | RMSE | R2 |
| 1 | 0.02704904 | 0. 0018169429 | 0. 042625614 | 0. 9579522798159749 |
| 2 | 0.02688995 | 0.001783095 | 0.04222671 | 0. 9587355894036145 |
| 3 | 0.027962448 | 0.0018775656 | 0.043330885 | 0.9565493462786324 |
| 4 | 0.027388193 | 0.0018127341 | 0.042576216 | 0.9580496792847144 |
| 5 | 0.026507894 | 0.0017877843 | 0.042282198 | 0.958627068430083 |
| 6 | 0.026796604 | 0.0018061803 | 0.04249918 | 0.9582013438432526 |
| 7 | 0.026945813 | 0.0018038737 | 0.042472035 | 0.9582547270264083 |
| 8 | 0.02693676 | 0.0018411634 | 0.04290878 | 0.9573917676323372 |
| 9 | 0.028317217 | 0.0019024553 | 0.043617144 | 0.9559733503788355 |
| 10 | 0.02696745 | 0.0017484524 | 0.0418145 | 0.9595372876079212 |
| Average | 0.0271761369 | 0.0018180247 | 0.0426353262 | 0.9579272439701774 |
| Standard Deviation | 0.00017663105650060832 | 0.00014859083741385604 | 1.4357969695669991e-05 | 0.0003322724341607144 |

Validation for 15mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fold | MAE | MSE | RMSE | R2 |
| 1 | 0.017284608 | 0. 00052819337 | 0. 022982458 | 0. 9326213081354561 |
| 2 | 0. 017413503 | 0. 00052280416 | 0. 022864912 | 0. 9333087790790451 |
| 3 | 0. 018427745 | 0. 000613482 | 0. 024768569 | 0. 9217415099529563 |
| 4 | 0. 018379416 | 0. 0005956763 | 0. 024406482 | 0. 9240128817952293 |
| 5 | 0. 017352575 | 0. 0005413781 | 0. 023267534 | 0. 9309393989900588 |
| 6 | 0. 018341295 | 0. 00059447973 | 0. 024381954 | 0. 9241655206188074 |
| 7 | 0. 017328398 | 0. 0005427435 | 0. 023296855 | 0. 9307652265305845 |
| 8 | 0. 018304028 | 0. 00056393305 | 0. 023747275 | 0. 9280621934895185 |
| 9 | 0. 018031027 | 0. 00057639607 | 0. 02400825 | 0. 9264723519181376 |
| 10 | 0.017178822 | 0.00052972825 | 0.023015827 | 0.9325254872836113 |
| Average | 0.017804141700000005 | 0.0005608814530000001 | 0.0236740116 | 0.9284614657793405 |
| Standard Deviation | 0.00016844061450111206 | 1.030352577820018e-05 | 0.00021670257950057823 | 0.001317756152391701 |

Validation for 20mm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fold | MAE | MSE | RMSE | R2 |
| 1 | 0.007978464 | 0. 000133446 | 0. 011551883 | 0. 9455492842274187 |
| 2 | 0. 009161059 | 0. 00013073 | 0. 0114337215 | 0. 9466575225083778 |
| 3 | 0. 00881325 | 0. 00012039307 | 0. 010972378 | 0. 9508753468110867 |
| 4 | 0. 007934828 | 0. 00012185566 | 0. 011038825 | 0. 9502785577400493 |
| 5 | 0. 008498118 | 0. 00013661105 | 0. 011688073 | 0. 9442578358174003 |
| 6 | 0. 0076440196 | 0. 00010233594 | 0. 010116123 | 0. 9582433020050865 |
| 7 | 0. 007022226 | 0. 000103856706 | 0. 010191011 | 0. 9576227704262268 |
| 8 | 0. 008286227 | 0. 00012835687 | 0. 011329469 | 0. 9476258285651071 |
| 9 | 0.0076667094 | 0. 000106185624 | 0. 010304641 | 0. 9566724924996812 |
| 10 | 0. 008117117 | 0. 00012818261 | 0. 011321776 | 0. 9476969459260068 |
| Average | 0.0081122018 | 0.00012119535300000002 | 0.01099479005 | 0.9505479886526441 |
| Standard Deviation | 0.00019510290182588028 | 4.0296379930450905e-06 | 0.00018557562299706008 | 0.0016442355472529207 |