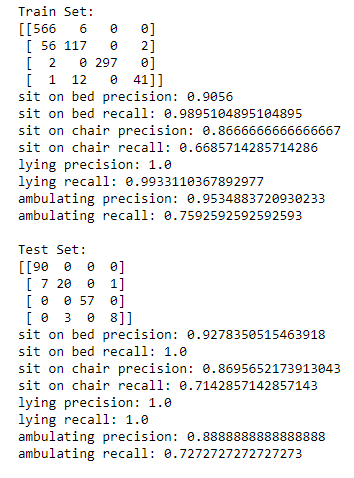
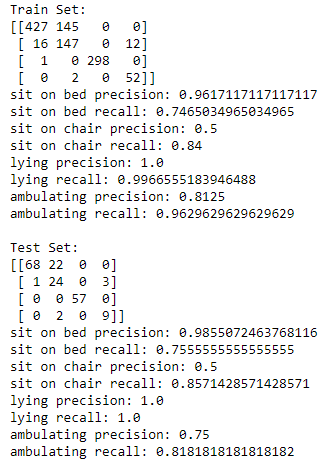
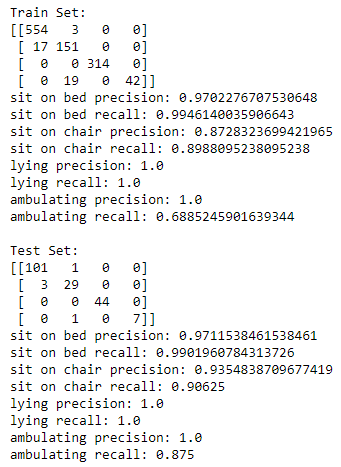
Single layer lstm 1000, 10 epoch



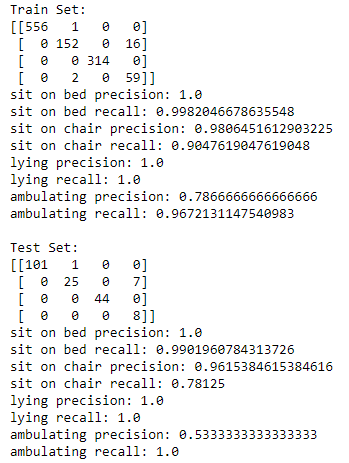
Double layer lstm 500,500, 10 epoch



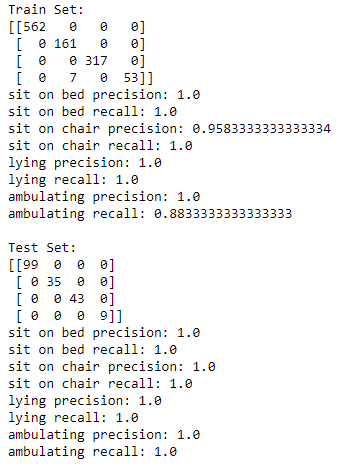
Double layer lstm 500,500, 20 epoch



Triple layer lstm 500,500,500 20 epoch



Triple layer lstm 500,500,500, 40 epoch



Alex Results

lstm\_model\_process\_1slookahead.h5

0.2steps|10s window |1s Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear

Train Set:

[[12232 51 70 138]

[ 6 10372 1 21]

[ 42 3 13642 8]

[ 49 80 28 2194]]

sit on bed precision: 0.9921323708329953

sit on bed recall: 0.9792650708510128

sit on chair precision: 0.9872453835903293

sit on chair recall: 0.9973076923076923

lying precision: 0.9927952841860127

lying recall: 0.9961299744432275

ambulating precision: 0.9292672596357475

ambulating recall: 0.9332199064227988

Test Set:

[[3597 11 17 42]

[ 0 2931 0 5]

[ 11 0 3853 8]

[ 9 12 5 624]]

sit on bed precision: 0.9944705557091512

sit on bed recall: 0.9809108262885192

sit on chair precision: 0.9922139471902505

sit on chair recall: 0.9982970027247956

lying precision: 0.9943225806451613

lying recall: 0.9950929752066116

ambulating precision: 0.9189985272459499

ambulating recall: 0.96

lstm\_model\_process\_clean\_labels\_1

0.2steps |10s window |clean |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear

Train Set:

[[5880 59 89 19]

[ 45 1754 24 15]

[ 95 27 5777 1]

[ 61 39 7 593]]

sit on bed precision: 0.9669462259496794

sit on bed recall: 0.9723829998346287

sit on chair precision: 0.9334752527940394

sit on chair recall: 0.9542981501632208

lying precision: 0.979650669832118

lying recall: 0.9791525423728814

ambulating precision: 0.9442675159235668

ambulating recall: 0.8471428571428572

Test Set:

[[1629 23 47 15]

[ 15 491 7 4]

[ 50 11 1650 4]

[ 22 18 2 151]]

sit on bed precision: 0.9493006993006993

sit on bed recall: 0.9504084014002334

sit on chair precision: 0.9042357274401474

sit on chair recall: 0.9497098646034816

lying precision: 0.9671746776084408

lying recall: 0.9620991253644315

ambulating precision: 0.867816091954023

ambulating recall: 0.7823834196891192

0.1steps |10s window |clean|50%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear

Train Set:

[[2490 1 20 8]

[ 19 709 1 4]

[ 13 3 2429 0]

[ 38 58 10 201]]

sit on bed precision: 0.97265625

sit on bed recall: 0.9884874950377134

sit on chair precision: 0.9195849546044098

sit on chair recall: 0.9672578444747613

lying precision: 0.9873983739837399

lying recall: 0.9934560327198364

ambulating precision: 0.9436619718309859

ambulating recall: 0.6547231270358306

Test Set:

[[724 2 6 4]

[ 11 206 0 3]

[ 3 0 673 0]

[ 12 17 0 54]]

sit on bed precision: 0.9653333333333334

sit on bed recall: 0.9836956521739131

sit on chair precision: 0.9155555555555556

sit on chair recall: 0.9363636363636364

lying precision: 0.9911634756995582

lying recall: 0.9955621301775148

ambulating precision: 0.8852459016393442

ambulating recall: 0.6506024096385542

0.2steps |20s window |clean|60%|35 Epochs with es|[1,2,3,4,5,8,9]|Linear

loss: 0.0474 - acc: 0.9852 - val\_loss: 0.1052 - val\_acc: 0.9778

Train Set:

[[6022 2 31 20]

[ 26 1790 1 14]

[ 20 0 5854 1]

[ 25 19 13 647]]

sit on bed precision: 0.9883472837682586

sit on bed recall: 0.9912757201646091

sit on chair precision: 0.988404196576477

sit on chair recall: 0.977607864554888

lying precision: 0.9923715884048143

lying recall: 0.9964255319148936

ambulating precision: 0.9486803519061584

ambulating recall: 0.9190340909090909

Test Set:

[[1653 4 20 14]

[ 19 530 0 9]

[ 16 0 1696 2]

[ 20 6 3 147]]

sit on bed precision: 0.9677985948477752

sit on bed recall: 0.9775280898876404

sit on chair precision: 0.9814814814814815

sit on chair recall: 0.9498207885304659

lying precision: 0.9866201279813845

lying recall: 0.9894982497082847

ambulating precision: 0.8546511627906976

ambulating recall: 0.8352272727272727

Model Params: LSTM\_30\_0.3\_60\_[1, 2, 3, 4, 5, 8, 9]\_linear

Train Set:

[[5196 11 20 37]

[ 11 1221 7 15]

[ 42 0 5141 5]

[ 14 26 6 542]]

sit on bed precision: 0.9872696180885426

sit on bed recall: 0.9870820668693009

sit on chair precision: 0.9705882352941176

sit on chair recall: 0.9736842105263158

lying precision: 0.9936219559335138

lying recall: 0.9909406322282189

ambulating precision: 0.9048414023372288

ambulating recall: 0.9217687074829932

Test Set:

[[1405 14 18 19]

[ 12 333 4 15]

[ 19 0 1500 2]

[ 18 6 5 143]]

sit on bed precision: 0.9662998624484181

sit on bed recall: 0.9649725274725275

sit on chair precision: 0.943342776203966

sit on chair recall: 0.9148351648351648

lying precision: 0.9823182711198428

lying recall: 0.9861932938856016

ambulating precision: 0.7988826815642458

ambulating recall: 0.8313953488372093

Model Params: LSTM\_15\_0.15\_60\_[1, 2, 3, 4, 5, 8, 9]\_linear

Train Set:

[[6328 32 55 26]

[ 22 2030 9 18]

[ 102 6 6980 10]

[ 29 25 10 695]]

sit on bed precision: 0.9763925320166641

sit on bed recall: 0.9824561403508771

sit on chair precision: 0.9698996655518395

sit on chair recall: 0.9764309764309764

lying precision: 0.989509498157074

lying recall: 0.9833755987602142

ambulating precision: 0.9279038718291055

ambulating recall: 0.9156785243741765

Test Set:

[[1759 11 29 15]

[ 15 555 5 9]

[ 49 3 2021 3]

[ 15 12 6 172]]

sit on bed precision: 0.9570184983677911

sit on bed recall: 0.9696802646085998

sit on chair precision: 0.955249569707401

sit on chair recall: 0.9503424657534246

lying precision: 0.9805919456574479

lying recall: 0.9735067437379576

ambulating precision: 0.864321608040201

ambulating recall: 0.8390243902439024

Model Params: LSTM\_15\_0.1\_60\_[1, 2, 3, 4, 5, 8, 9]\_linear

loss: 0.0679 - acc: 0.9786 - val\_loss: 0.0906 - val\_acc: 0.9784

Train Set:

[[6702 10 33 32]

[ 4 2222 0 3]

[ 68 0 8543 2]

[ 26 41 9 794]]

sit on bed precision: 0.9855882352941177

sit on bed recall: 0.9889331562638336

sit on chair precision: 0.9775626924769028

sit on chair recall: 0.996859578286227

lying precision: 0.9951077460687245

lying recall: 0.9918727504934401

ambulating precision: 0.9554753309265944

ambulating recall: 0.9126436781609195

Test Set:

[[1864 15 27 17]

[ 14 603 1 10]

[ 41 2 2454 0]

[ 18 13 7 197]]

sit on bed precision: 0.9623128549303046

sit on bed recall: 0.96931877275091

sit on chair precision: 0.95260663507109

sit on chair recall: 0.9601910828025477

lying precision: 0.9859381277621535

lying recall: 0.9827793352022427

ambulating precision: 0.8794642857142857

ambulating recall: 0.8382978723404255

Model Params: LSTM\_15\_0.1\_60\_[2, 4, 5, 8, 9]\_linear

Train Set:

[[6757 8 55 27]

[ 11 2177 0 25]

[ 99 2 8483 1]

[ 63 72 12 697]]

sit on bed precision: 0.975036075036075

sit on bed recall: 0.9868555571783263

sit on chair precision: 0.963700752545374

sit on chair recall: 0.9837324898328061

lying precision: 0.9921637426900585

lying recall: 0.9881188118811881

ambulating precision: 0.9293333333333333

ambulating recall: 0.8258293838862559

Test Set:

[[1880 9 41 12]

[ 12 621 0 8]

[ 56 1 2404 1]

[ 35 21 5 177]]

sit on bed precision: 0.9480584972264247

sit on bed recall: 0.9680741503604532

sit on chair precision: 0.9524539877300614

sit on chair recall: 0.968798751950078

lying precision: 0.9812244897959184

lying recall: 0.9764419171405362

ambulating precision: 0.8939393939393939

ambulating recall: 0.7436974789915967

Model Params: LSTM\_15\_0.1\_60\_[1, 2, 3, 4, 5]\_linear

Train Set:

[[6662 3 73 31]

[ 15 2236 1 9]

[ 11 1 8591 1]

[ 41 22 14 778]]

sit on bed precision: 0.9900430970426513

sit on bed recall: 0.984192642931009

sit on chair precision: 0.9885057471264368

sit on chair recall: 0.9889429455992923

lying precision: 0.9898605830164765

lying recall: 0.9984890748489075

ambulating precision: 0.9499389499389499

ambulating recall: 0.9099415204678363

Test Set:

[[1892 5 28 14]

[ 12 568 1 6]

[ 10 0 2511 0]

[ 15 21 7 193]]

sit on bed precision: 0.9808190772420944

sit on bed recall: 0.9757607013924704

sit on chair precision: 0.9562289562289562

sit on chair recall: 0.9676320272572402

lying precision: 0.9858657243816255

lying recall: 0.996033320111067

ambulating precision: 0.9061032863849765

ambulating recall: 0.8177966101694916

Model Params: LSTM\_15\_0.1\_100\_[1, 2, 3, 4, 5]\_linear

Train Set:

[[10115 14 76 19]

[ 12 3013 2 16]

[ 42 3 17731 5]

[ 77 53 18 1068]]

sit on bed precision: 0.9872145227405817

sit on bed recall: 0.9893388106416275

sit on chair precision: 0.9772948426856958

sit on chair recall: 0.9901413079198159

lying precision: 0.994614909968026

lying recall: 0.9971880096732467

ambulating precision: 0.9638989169675091

ambulating recall: 0.8782894736842105

Test Set:

[[2726 13 42 10]

[ 17 862 0 7]

[ 31 5 5114 3]

[ 38 28 8 314]]

sit on bed precision: 0.9694167852062588

sit on bed recall: 0.9767108563238982

sit on chair precision: 0.9493392070484582

sit on chair recall: 0.9729119638826185

lying precision: 0.9903175832687839

lying recall: 0.9924315932466524

ambulating precision: 0.9401197604790419

ambulating recall: 0.8092783505154639

Model Params: LSTM\_15\_0.1\_100\_[1, 2, 3, 4, 5, 8, 9]\_linear

Train Set:

[[ 9942 19 82 32]

[ 7 3044 2 10]

[ 27 3 17864 4]

[ 47 39 20 1122]]

sit on bed precision: 0.9919185872493266

sit on bed recall: 0.9867990074441687

sit on chair precision: 0.980354267310789

sit on chair recall: 0.9937969311132876

lying precision: 0.9942119323241317

lying recall: 0.9981003464074198

ambulating precision: 0.9606164383561644

ambulating recall: 0.9136807817589576

Test Set:

[[2832 13 35 20]

[ 16 864 0 14]

[ 17 4 5031 7]

[ 35 23 15 292]]

sit on bed precision: 0.976551724137931

sit on bed recall: 0.976551724137931

sit on chair precision: 0.9557522123893806

sit on chair recall: 0.9664429530201343

lying precision: 0.9901594174375123

lying recall: 0.9944653093496738

ambulating precision: 0.8768768768768769

ambulating recall: 0.8

Model Params: LSTM\_15\_0.1\_60\_[1, 2, 3, 4, 5, 8, 9]\_linear

loss: 0.0679 - acc: 0.9786 - val\_loss: 0.0906 - val\_acc: 0.9784

Train Set:

[[6702 10 33 32]

[ 4 2222 0 3]

[ 68 0 8543 2]

[ 26 41 9 794]]

sit on bed precision: 0.9855882352941177

sit on bed recall: 0.9889331562638336

sit on chair precision: 0.9775626924769028

sit on chair recall: 0.996859578286227

lying precision: 0.9951077460687245

lying recall: 0.9918727504934401

ambulating precision: 0.9554753309265944

ambulating recall: 0.9126436781609195

Test Set:

[[1864 15 27 17]

[ 14 603 1 10]

[ 41 2 2454 0]

[ 18 13 7 197]]

sit on bed precision: 0.9623128549303046

sit on bed recall: 0.96931877275091

sit on chair precision: 0.95260663507109

sit on chair recall: 0.9601910828025477

lying precision: 0.9859381277621535

lying recall: 0.9827793352022427

ambulating precision: 0.8794642857142857

ambulating recall: 0.8382978723404255

Model Params: LSTM\_15\_0.1\_60\_[1, 2, 3, 4, 5, 8, 9, 10]\_linear

Train Set:

[[6692 53 17 89]

[ 21 2221 0 7]

[ 103 1 8376 103]

[ 32 27 7 740]]

sit on bed precision: 0.9772196261682243

sit on bed recall: 0.9767917092395271

sit on chair precision: 0.9648132059079062

sit on chair recall: 0.9875500222321032

lying precision: 0.9971428571428571

lying recall: 0.975882558545963

ambulating precision: 0.7880724174653887

ambulating recall: 0.9181141439205955

Test Set:

[[1820 24 7 35]

[ 15 624 0 10]

[ 48 1 2395 27]

[ 17 15 3 242]]

sit on bed precision: 0.9578947368421052

sit on bed recall: 0.9650053022269353

sit on chair precision: 0.9397590361445783

sit on chair recall: 0.9614791987673343

lying precision: 0.9958419958419958

lying recall: 0.9692432213678672

ambulating precision: 0.7707006369426752

ambulating recall: 0.8736462093862816

Model Params: LSTM\_15\_0.1\_100\_[1, 2, 3, 4, 5, 8, 9, 10]\_linear

Train Set:

[[10040 3 39 25]

[ 22 3029 2 12]

[ 265 2 17585 10]

[ 70 31 22 1107]]

sit on bed precision: 0.965663172068866

sit on bed recall: 0.9933709310378945

sit on chair precision: 0.9882544861337683

sit on chair recall: 0.9882544861337683

lying precision: 0.9964301903898459

lying recall: 0.9844922181166723

ambulating precision: 0.9592720970537262

ambulating recall: 0.9

Test Set:

[[2837 9 23 25]

[ 18 844 2 20]

[ 85 2 4989 10]

[ 32 25 12 285]]

sit on bed precision: 0.9545760430686406

sit on bed recall: 0.9803040774015204

sit on chair precision: 0.9590909090909091

sit on chair recall: 0.9547511312217195

lying precision: 0.9926382809391165

lying recall: 0.9809280377506882

ambulating precision: 0.8382352941176471

ambulating recall: 0.8050847457627118

|  |  |
| --- | --- |
| Test Params | Done |
| 0.2steps|10s window |1s Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | Yes |
| 0.2steps|10s window |2s Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | Pend |
| 0.2steps|10s window |3s Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | Pend |
| 0.2steps|10s window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | No |
| 0.2steps|5s window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | No |
| 0.2steps|15s window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear | No |
| 0.2steps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| 0.1steps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| 0.5steps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| Bsteps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| Bsteps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| Bsteps|Bs window |Bs Lookahead |60%|21 Epochs with es|[1,2,3,4,5,8,9]|Linear |  |
| Bsteps|Bs window |Bs Lookahead |%|21 Epochs with es|[4,5,8,9]|Linear |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Best Performing Network

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Network Type | Window Size | Interpolation Step | Interpolation Type | Features used | Filtering | Epochs Trained | Activity Filtering (%) |
| LSTM | 15 | 0.1s | Linear | [1, 2, 3, 4, 5, 8, 9] | None | 19 | 60 |

#################################PCA Decision tree###################################

DT

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | No | 90 |

array([0.93485593, 0.93244025, 0.94043373])

Train Set:

[[ 9307 74 472 204]

[ 78 2893 7 100]

[ 578 9 16140 81]

[ 212 86 74 813]]

sit on bed precision: 0.9146928746928747

sit on bed recall: 0.9254250770607537

sit on chair precision: 0.9448073154800783

sit on chair recall: 0.9398960363872645

lying precision: 0.9668723417001138

lying recall: 0.9602570204664446

ambulating precision: 0.6786310517529215

ambulating recall: 0.6860759493670886

Validation Set:

[[1204 36 178 55]

[ 40 384 2 18]

[ 194 3 2127 26]

[ 45 29 20 85]]

sit on bed precision: 0.8118678354686446

sit on bed recall: 0.8173794976238968

sit on chair precision: 0.8495575221238938

sit on chair recall: 0.8648648648648649

lying precision: 0.9140524280189085

lying recall: 0.9051063829787234

ambulating precision: 0.46195652173913043

ambulating recall: 0.4748603351955307

RandomForestClassifier(n\_estimators=100, max\_depth=10,random\_state=0)

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | No | 90 |

array([0.95181652, 0.9460293 , 0.95007229])

Train Set:

[[ 9554 69 419 15]

[ 93 2952 1 32]

[ 465 7 16333 3]

[ 281 97 96 711]]

sit on bed precision: 0.9192725873183873

sit on bed recall: 0.9499850850154121

sit on chair precision: 0.94464

sit on chair recall: 0.9590643274853801

lying precision: 0.9693750370941896

lying recall: 0.9717396477867682

ambulating precision: 0.9342969776609724

ambulating recall: 0.6

Validation Set:

[[1333 12 120 8]

[ 25 412 0 7]

[ 150 0 2200 0]

[ 58 23 18 80]]

sit on bed precision: 0.851213282247765

sit on bed recall: 0.9049558723693143

sit on chair precision: 0.9217002237136466

sit on chair recall: 0.9279279279279279

lying precision: 0.9409751924721984

lying recall: 0.9361702127659575

ambulating precision: 0.8421052631578947

ambulating recall: 0.44692737430167595

Dt

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 20 | 90 |

array([0.93640393, 0.94766769, 0.94563331])

Train Set:

[[ 9335 230 358 170]

[ 208 2787 25 66]

[ 326 23 16367 44]

[ 188 82 42 877]]

sit on bed precision: 0.9282092075171522

sit on bed recall: 0.9248984444664619

sit on chair precision: 0.8926969891095452

sit on chair recall: 0.9031108230719378

lying precision: 0.9746903287279657

lying recall: 0.9765513126491647

ambulating precision: 0.7579948141745895

ambulating recall: 0.7375946173254836

Validation Set:

[[1209 84 154 53]

[ 62 315 10 21]

[ 143 25 2149 27]

[ 38 16 22 118]]

sit on bed precision: 0.8326446280991735

sit on bed recall: 0.806

sit on chair precision: 0.7159090909090909

sit on chair recall: 0.7720588235294118

lying precision: 0.9203426124197002

lying recall: 0.9168088737201365

ambulating precision: 0.5388127853881278

ambulating recall: 0.6082474226804123

RandomForestClassifier(n\_estimators=100, max\_depth=10,random\_state=0)

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 20 | 90 |

Train Set:

[[ 9482 63 524 24]

[ 715 2342 8 21]

[ 804 4 15952 0]

[ 369 89 99 632]]

sit on bed precision: 0.8339489885664028

sit on bed recall: 0.9394629941543644

sit on chair precision: 0.9375500400320256

sit on chair recall: 0.7589112119248218

lying precision: 0.9619489838991738

lying recall: 0.9517899761336516

ambulating precision: 0.9335302806499262

ambulating recall: 0.5315391084945332

Validation Set:

[[1333 13 148 6]

[ 109 297 2 0]

[ 144 0 2199 1]

[ 53 11 24 106]]

sit on bed precision: 0.813300793166565

sit on bed recall: 0.8886666666666667

sit on chair precision: 0.9252336448598131

sit on chair recall: 0.7279411764705882

lying precision: 0.9266750948166877

lying recall: 0.9381399317406144

ambulating precision: 0.9380530973451328

ambulating recall: 0.5463917525773195

Dt

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 90 |

array([0.94228175, 0.94380723, 0.94477108])

Train Set:

[[ 9436 188 325 182]

[ 206 2723 16 98]

[ 322 35 16338 52]

[ 180 75 50 902]]

sit on bed precision: 0.930205047318612

sit on bed recall: 0.9313986773270161

sit on chair precision: 0.9013571665011586

sit on chair recall: 0.8948406178113704

lying precision: 0.9766274134736087

lying recall: 0.9755777154117156

ambulating precision: 0.7309562398703403

ambulating recall: 0.7473073736536868

Validation Set:

[[1193 57 141 55]

[ 53 378 9 15]

[ 119 14 2237 10]

[ 44 20 14 87]]

sit on bed precision: 0.8466997870830376

sit on bed recall: 0.8250345781466113

sit on chair precision: 0.8059701492537313

sit on chair recall: 0.8307692307692308

lying precision: 0.931695127030404

lying recall: 0.9399159663865546

ambulating precision: 0.5209580838323353

ambulating recall: 0.5272727272727272

RandomForestClassifier(n\_estimators=100, max\_depth=10,random\_state=0)

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 90 |

array([0.9209867 , 0.92443373, 0.92115663])

Train Set:

[[ 9581 80 441 29]

[ 627 2375 6 35]

[ 681 3 16060 3]

[ 357 101 59 690]]

sit on bed precision: 0.8519473590609995

sit on bed recall: 0.9457111834961998

sit on chair precision: 0.9280969128565846

sit on chair recall: 0.7804797896812357

lying precision: 0.9694555112881806

lying recall: 0.958977727354153

ambulating precision: 0.9114927344782034

ambulating recall: 0.5716652858326429

Validation Set:

[[1281 23 131 11]

[ 111 334 5 5]

[ 119 0 2260 1]

[ 65 13 14 73]]

sit on bed precision: 0.8128172588832487

sit on bed recall: 0.8858921161825726

sit on chair precision: 0.9027027027027027

sit on chair recall: 0.734065934065934

lying precision: 0.9377593360995851

lying recall: 0.9495798319327731

ambulating precision: 0.8111111111111111

ambulating recall: 0.44242424242424244

Dt

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 60 |

array([0.94792343, 0.94289422, 0.94968349])

Train Set:

[[6391 124 163 117]

[ 126 2001 15 47]

[ 169 14 8443 19]

[ 128 48 25 659]]

sit on bed precision: 0.9379219254476079

sit on bed recall: 0.9405445180279617

sit on chair precision: 0.9149519890260631

sit on chair recall: 0.9141160347190498

lying precision: 0.9765209345362017

lying recall: 0.9766338924233661

ambulating precision: 0.7826603325415677

ambulating recall: 0.7662790697674419

Validation Set:

[[ 837 49 63 30]

[ 62 205 7 14]

[ 61 7 1180 9]

[ 25 22 9 61]]

sit on bed precision: 0.849746192893401

sit on bed recall: 0.8549540347293156

sit on chair precision: 0.7243816254416962

sit on chair recall: 0.7118055555555556

lying precision: 0.937251787132645

lying recall: 0.9387430389817024

ambulating precision: 0.5350877192982456

ambulating recall: 0.5213675213675214

RandomForestClassifier(n\_estimators=100, max\_depth=10,random\_state=0)

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (10,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 60 |

array([0.93818949, 0.9412719 , 0.9425418 ])

Train Set:

[[6515 135 189 18]

[ 254 1901 7 15]

[ 167 5 8429 2]

[ 224 63 18 547]]

sit on bed precision: 0.9099162011173184

sit on bed recall: 0.9501239609158524

sit on chair precision: 0.9035171102661597

sit on chair recall: 0.8732200275608636

lying precision: 0.9752400786763855

lying recall: 0.9797744972683947

ambulating precision: 0.9398625429553265

ambulating recall: 0.642018779342723

Validation Set:

[[ 857 31 47 12]

[ 58 260 1 1]

[ 56 0 1192 0]

[ 42 7 4 73]]

sit on bed precision: 0.8460019743336624

sit on bed recall: 0.9049630411826821

sit on chair precision: 0.87248322147651

sit on chair recall: 0.8125

lying precision: 0.9581993569131833

lying recall: 0.9551282051282052

ambulating precision: 0.8488372093023255

ambulating recall: 0.5793650793650794

Dt

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (5,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 60 |

array([0.93202466, 0.93477203, 0.93151574])

Train Set:

[[6190 165 281 139]

[ 127 2003 11 64]

[ 219 8 8384 26]

[ 149 37 28 658]]

sit on bed precision: 0.9259536275243081

sit on bed recall: 0.9136531365313653

sit on chair precision: 0.9051061906913692

sit on chair recall: 0.908390022675737

lying precision: 0.9632352941176471

lying recall: 0.9707074215584115

ambulating precision: 0.741826381059752

ambulating recall: 0.7545871559633027

Validation Set:

[[ 839 63 82 26]

[ 46 266 4 14]

[ 92 6 1096 8]

[ 20 10 5 64]]

sit on bed precision: 0.8415245737211635

sit on bed recall: 0.8306930693069307

sit on chair precision: 0.7710144927536232

sit on chair recall: 0.806060606060606

lying precision: 0.9233361415332771

lying recall: 0.9118136439267887

ambulating precision: 0.5714285714285714

ambulating recall: 0.6464646464646465

RandomForestClassifier(n\_estimators=100, max\_depth=10,random\_state=0)

|  |  |  |
| --- | --- | --- |
| Data | PCA | Activity Filtering |
| (5,0.1,ts\_features=[1,2,3,4,5,8,9], kind = 'linear') | 10 | 60 |

array([0.92310188, 0.92373844, 0.92567348])

Train Set:

[[6353 155 238 29]

[ 253 1929 1 22]

[ 384 3 8248 2]

[ 221 74 20 557]]

sit on bed precision: 0.8810151157953127

sit on bed recall: 0.9377121771217712

sit on chair precision: 0.8926422952336881

sit on chair recall: 0.8748299319727891

lying precision: 0.9695544845421418

lying recall: 0.954961213384277

ambulating precision: 0.9131147540983606

ambulating recall: 0.6387614678899083

Validation Set:

[[ 905 36 67 2]

[ 58 268 3 1]

[ 68 2 1132 0]

[ 27 14 5 53]]

sit on bed precision: 0.8553875236294896

sit on bed recall: 0.8960396039603961

sit on chair precision: 0.8375

sit on chair recall: 0.8121212121212121

lying precision: 0.9378624689312345

lying recall: 0.9417637271214643

ambulating precision: 0.9464285714285714

ambulating recall: 0.5353535353535354