**Log from generation of nod, shake, tilt 4comb segmented datasets**

(print outputs generated by the script datasets\_scripts/4comb/generate\_4comb\_dataset.ipynb)

**1.) A1 augmentation: horizontal flip of 3 rotation features (all 8 combinations)**

Head gesture: nod

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

Augmentation params:

{'augment\_id': 1, 'horizontal\_flip\_feature\_types': [' pose\_Rx', ' pose\_Ry', ' pose\_Rz'], 'horizontal\_flip\_bin\_encodings': ['000', '010', '100', '110', '001', '011', '101', '111']}

vra1 dataset:

33 train subjects

6 val subjects

6 test subjects

X\_train 1072896

Y\_train 1072896

train\_len 264

X\_val 25857

Y\_val 25857

val\_len 6

X\_test 24784

Y\_test 24784

test\_len 6

sewa dataset:

193 train subjects

41 val subjects

41 test subjects

X\_train 2771528

Y\_train 2771528

train\_len 3304

X\_val 63623

Y\_val 63623

val\_len 81

X\_test 74601

Y\_test 74601

test\_len 89

hatice2010 dataset [nodshake]:

6 train subjects

1 val subjects

1 test subjects

hatice2010 dataset [other]:

5 train subjects

1 val subjects

1 test subjects

X\_train 2925184

Y\_train 2925184

train\_len 6912

X\_val 64549

Y\_val 64549

val\_len 109

X\_test 77327

Y\_test 77327

test\_len 151

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 4375712

Y\_train 4375712

train\_len 7136

X\_val 85629

Y\_val 85629

val\_len 114

X\_test 102945

Y\_test 102945

test\_len 156

X\_train (4375712, 32, 12)

Y\_train (4375712, 32, 1)

train\_len (7136,)

X\_val (85629, 32, 12)

Y\_val (85629, 32, 1)

val\_len (114,)

X\_test (102945, 32, 12)

Y\_test (102945, 32, 1)

test\_len (156,)

train:val:test = 4375712:85629:102945 = 0.9586848852153437:0.018760656102619337:0.022554458682037017

Number of train examples per class: (array([0., 1.]), array([3914496, 461216]))

Number of val examples per class: (array([0., 1.]), array([78291, 7338]))

Number of test examples per class: (array([0., 1.]), array([93707, 9238]))

Total time taken: 1826.8670070171356 s

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Head gesture: shake

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

Augmentation params:

{'augment\_id': 1, 'horizontal\_flip\_feature\_types': [' pose\_Rx', ' pose\_Ry', ' pose\_Rz'], 'horizontal\_flip\_bin\_encodings': ['000', '010', '100', '110', '001', '011', '101', '111']}

sewa dataset:

193 train subjects

41 val subjects

41 test subjects

X\_train 1698632

Y\_train 1698632

train\_len 3040

X\_val 37766

Y\_val 37766

val\_len 75

X\_test 49817

Y\_test 49817

test\_len 83

hatice2010 dataset [nodshake]:

6 train subjects

1 val subjects

1 test subjects

hatice2010 dataset [other]:

5 train subjects

1 val subjects

1 test subjects

X\_train 1852288

Y\_train 1852288

train\_len 6648

X\_val 38692

Y\_val 38692

val\_len 103

X\_test 52543

Y\_test 52543

test\_len 145

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 3302816

Y\_train 3302816

train\_len 6872

X\_val 59772

Y\_val 59772

val\_len 108

X\_test 78161

Y\_test 78161

test\_len 150

X\_train (3302816, 32, 12)

Y\_train (3302816, 32, 1)

train\_len (6872,)

X\_val (59772, 32, 12)

Y\_val (59772, 32, 1)

val\_len (108,)

X\_test (78161, 32, 12)

Y\_test (78161, 32, 1)

test\_len (150,)

train:val:test = 3302816:59772:78161 = 0.9599119261532881:0.01737179898911545:0.022716274857596412

Number of train examples per class: (array([0., 1.]), array([3120168, 182648]))

Number of val examples per class: (array([0., 1.]), array([58287, 1485]))

Number of test examples per class: (array([0., 1.]), array([72484, 5677]))

Total time taken: 1483.7619051933289 s

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Head gesture: tilt

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

Augmentation params:

{'augment\_id': 1, 'horizontal\_flip\_feature\_types': [' pose\_Rx', ' pose\_Ry', ' pose\_Rz'], 'horizontal\_flip\_bin\_encodings': ['000', '010', '100', '110', '001', '011', '101', '111']}

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 1450528

Y\_train 1450528

train\_len 224

X\_val 21080

Y\_val 21080

val\_len 5

X\_test 25618

Y\_test 25618

test\_len 5

X\_train (1450528, 32, 12)

Y\_train (1450528, 32, 1)

train\_len (224,)

X\_val (21080, 32, 12)

Y\_val (21080, 32, 1)

val\_len (5,)

X\_test (25618, 32, 12)

Y\_test (25618, 32, 1)

test\_len (5,)

train:val:test = 1450528:21080:25618 = 0.9688103198849072:0.01407937078303476:0.017110309332058087

Number of train examples per class: (array([0., 1.]), array([1378848, 71680]))

Number of val examples per class: (array([0., 1.]), array([20264, 816]))

Number of test examples per class: (array([0., 1.]), array([24584, 1034]))

Total time taken: 126.89953947067261 s

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**2.) Without augmentations**

Head gesture: nod

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

vra1 dataset:

33 train subjects

6 val subjects

6 test subjects

X\_train 134112

Y\_train 134112

train\_len 33

X\_val 25857

Y\_val 25857

val\_len 6

X\_test 24784

Y\_test 24784

test\_len 6

sewa dataset:

193 train subjects

41 val subjects

41 test subjects

X\_train 346441

Y\_train 346441

train\_len 413

X\_val 63623

Y\_val 63623

val\_len 81

X\_test 74601

Y\_test 74601

test\_len 89

hatice2010 dataset [nodshake]:

6 train subjects

1 val subjects

1 test subjects

hatice2010 dataset [other]:

5 train subjects

1 val subjects

1 test subjects

X\_train 365648

Y\_train 365648

train\_len 864

X\_val 64549

Y\_val 64549

val\_len 109

X\_test 77327

Y\_test 77327

test\_len 151

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 546964

Y\_train 546964

train\_len 892

X\_val 85629

Y\_val 85629

val\_len 114

X\_test 102945

Y\_test 102945

test\_len 156

X\_train (546964, 32, 12)

Y\_train (546964, 32, 1)

train\_len (892,)

X\_val (85629, 32, 12)

Y\_val (85629, 32, 1)

val\_len (114,)

X\_test (102945, 32, 12)

Y\_test (102945, 32, 1)

test\_len (156,)

train:val = 546964:85629:102945 = 0.7436243946607789:0.1164168268668648:0.1399587784723563

Number of train examples per class: (array([0., 1.]), array([489312, 57652]))

Number of val examples per class: (array([0., 1.]), array([78291, 7338]))

Number of test examples per class: (array([0., 1.]), array([93707, 9238]))

Total time taken: 256.4142873287201 s

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Head gesture: shake

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

sewa dataset:

193 train subjects

41 val subjects

41 test subjects

X\_train 212329

Y\_train 212329

train\_len 380

X\_val 37766

Y\_val 37766

val\_len 75

X\_test 49817

Y\_test 49817

test\_len 83

hatice2010 dataset [nodshake]:

6 train subjects

1 val subjects

1 test subjects

hatice2010 dataset [other]:

5 train subjects

1 val subjects

1 test subjects

X\_train 231536

Y\_train 231536

train\_len 831

X\_val 38692

Y\_val 38692

val\_len 103

X\_test 52543

Y\_test 52543

test\_len 145

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 412852

Y\_train 412852

train\_len 859

X\_val 59772

Y\_val 59772

val\_len 108

X\_test 78161

Y\_test 78161

test\_len 150

X\_train (412852, 32, 12)

Y\_train (412852, 32, 1)

train\_len (859,)

X\_val (59772, 32, 12)

Y\_val (59772, 32, 1)

val\_len (108,)

X\_test (78161, 32, 12)

Y\_test (78161, 32, 1)

test\_len (150,)

train:val = 412852:59772:78161 = 0.7495701589549462:0.10852147389634793:0.14190836714870594

Number of train examples per class: (array([0., 1.]), array([390021, 22831]))

Number of val examples per class: (array([0., 1.]), array([58287, 1485]))

Number of test examples per class: (array([0., 1.]), array([72484, 5677]))

Total time taken: 189.57718133926392 s

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Head gesture: tilt

Window size: 32

Val size: 0.15 Test size: 0.15

Selected features:

['diff\_ pose\_Tx', 'diff\_ pose\_Ty', 'diff\_ pose\_Tz', 'diff2\_ pose\_Tx', 'diff2\_ pose\_Ty', 'diff2\_ pose\_Tz', 'diff\_ pose\_Rx', 'diff\_ pose\_Ry', 'diff\_ pose\_Rz', 'diff2\_ pose\_Rx', 'diff2\_ pose\_Ry', 'diff2\_ pose\_Rz']

nvb dataset:

28 train subjects

5 val subjects

5 test subjects

X\_train 181316

Y\_train 181316

train\_len 28

X\_val 21080

Y\_val 21080

val\_len 5

X\_test 25618

Y\_test 25618

test\_len 5

X\_train (181316, 32, 12)

Y\_train (181316, 32, 1)

train\_len (28,)

X\_val (21080, 32, 12)

Y\_val (21080, 32, 1)

val\_len (5,)

X\_test (25618, 32, 12)

Y\_test (25618, 32, 1)

test\_len (5,)

train:val = 181316:21080:25618 = 0.7951967861622532:0.09245046356802653:0.11235275026972028

Number of train examples per class: (array([0., 1.]), array([172356, 8960]))

Number of val examples per class: (array([0., 1.]), array([20264, 816]))

Number of test examples per class: (array([0., 1.]), array([24584, 1034]))

Total time taken: 41.85125756263733 s

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