

Supplementary materials for FineGym: A Hierarchical Video Dataset for Fine-grained Action Understanding

Dian Shao Yue Zhao Bo Dai Dahua Lin
CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong
{sd017, zy317, bdai, dhlin}@ie.cuhk.edu.hk

1. Experiments

1.1. Implementation details

TSN We use BNInception [5] as the backbone network for TSN [10]. The number of input segments is set to be 3 by default. The model weights are initialized from those pre-trained on ImageNet [2]. The dropout is set to be 0.8. For the spatial-stream(*i.e.* RGB), the model is trained for 80 epochs, starting at an initial learning rate of 0.001. The learning rate is reduced to its $\frac{1}{10}$ every 30 epochs. For the temporal-stream(*i.e.* Flow), the model is trained for 200 epochs, start at an initial learning rate of 0.002. The learning rate is then reduced to its $\frac{1}{10}$ every 80 epochs.

TRN We use BNInception [5] as the backbone network for TRN [13] as well. The training schedule is similar to that of TSN stated above. We also report the performance of multi-scale TRN, denoted by TRNms.

TSM We use ResNet-50 [4] as the backbone network of the TSM [7]. The number of input segments is set to be 3 by default. The model is trained for 100 epochs with learning rate decreased by 0.1 at every 40 epochs. Other training schedule is similar to that of TSN.

ActionVLAD The underlying network of ActionVLAD is based on VGG-16 [8]. 10 frames are uniformly sampled from the video as input. The number of the VLAD clusters is set to be 64. We follow the two-step procedure as stated in [3]. In the first step, we initialize the VLAD cluster centers by clustering pre-extracted features using K-Means, and then set the centers fixed to train the linear classifier with a learning rate of 0.01. In the second step, we jointly finetune both the linear classifier and the ActionVLAD cluster centers with a learning rate of 10^{-4} . During both steps, the layers before conv5_1 are frozen to avoid overfitting. We empirically find that the number of training iterations, especially that in the second step, is important for final performance. Therefore, the first step lasts 20 epochs and the second lasts 80 epochs.

I3D We use a 3D ConvNet based on ResNet-50 [4]. The input is a video clip with 8 frames, sampled from 16 consecutive frames with a stride of 2. The model is initialized by

two types: (1) inflating the 2D convolutional kernels from an ImageNet-pretrained model to its 3D counterpart; (2) directly utilizing the model weights of a 3D ConvNet trained on Kinetics-400 [6] (denoted as **I3D***). The dropout is set to be 0.5. The model is trained for 100 epochs, starting at an initial learning rate of 0.001. The learning rate is reduced to its $\frac{1}{10}$ every 40 epochs.

Non-local I3D Following [11], we add non-local module with Gaussian embedding at the blocks of res3b, res3d, res4b, res4d, res4f. The rest of the settings follow those of I3D. Particularly, We denote the ImageNet-pretrained model to be **NL I3D** and the Kinetics-pretrained model to be **NL I3D***.

ST-GCN We first obtain the coordinates of human keypoints in each frame using Cascade R-CNN [1] and HR-Net [9] as the human detector and pose estimator respectively. Afterwards, ST-GCN [12] is trained on top. The training setting is similar to original one, except that the training epochs are increased five times.

1.2. Confusion matrices

We present the confusion matrices of different methods, *i.e.* TSN, TRN, I3D, and ST-GCN (all fine-tuned from ImageNet pre-trained weights) on two sets, *i.e.* FX-S1 and UB-S1 in Figure 1 and Figure 2. The category names within each set are enumerated in Table 1 and Table 2 for reference. We observe that current methods do not perform well in distinguishing between complex temporal dynamics, such as the degree of rotation (*i.e.* number of turns).

2. Dataset

2.1. Dataset overview

Our *FineGym* dataset is fine-grained both semantically and temporally. For semantic hierarchy, the categorical labels are organized according to a three-level hierarchy, namely events, sets, and elements. For temporal structure, all action instances of interest in each video are identified and decomposed into sub-actions. We refer the readers to the first part of 4252_demo.mp4 for illustration.

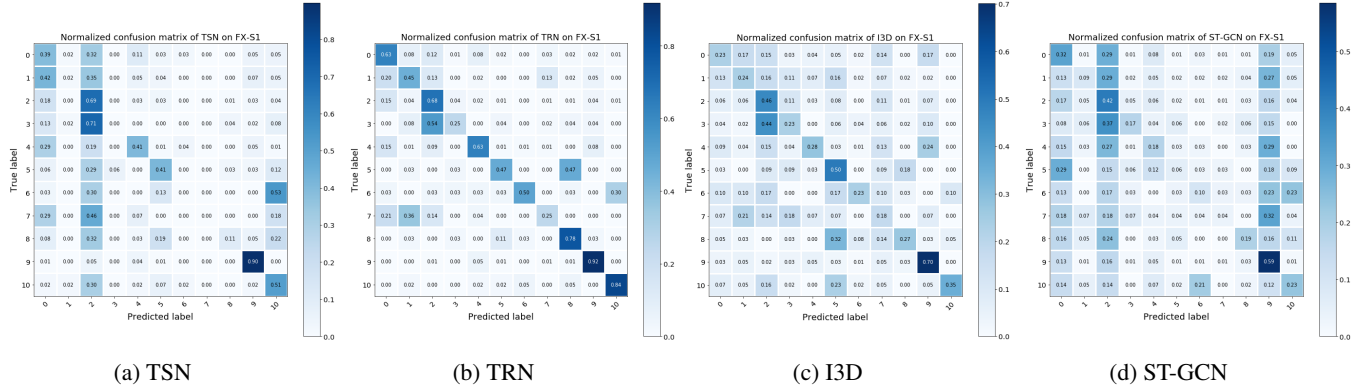


Figure 1: Normalized confusion matrix of different methods on FX-S1 (*Leap-jump-hop in Floor Exercise*).

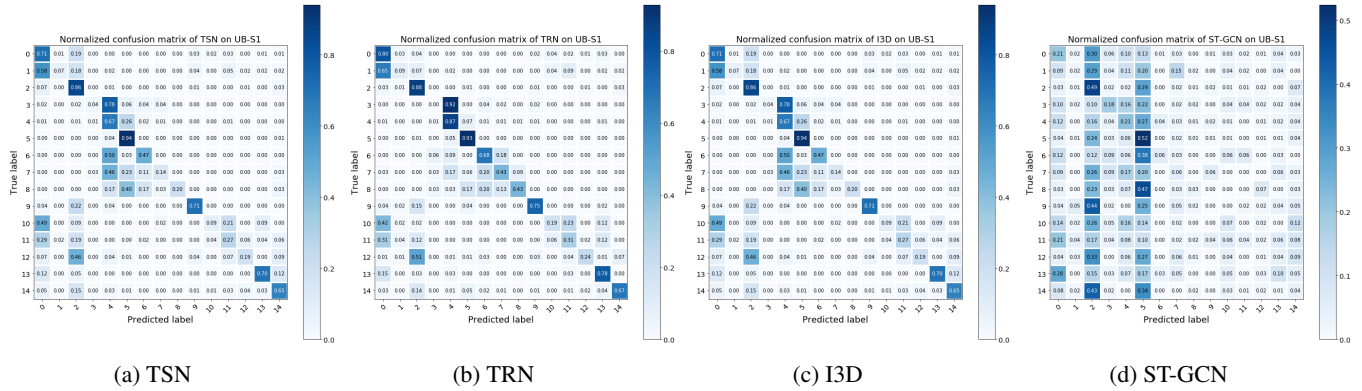


Figure 2: Normalized confusion matrix of different methods on UB-S1 (*The Circles in Uneven Bars*).

FX-S1 from <i>Gym99</i>	
Label ID	Category name
0	Switch leap with 0.5 turn
1	Switch leap with 1 turn
2	Split leap with 1 turn
3	Split leap with 1.5 turn
4	Switch leap
5	Split Jump with 1 turn
6	Split jump
7	Johnson with additional 0.5 turn
8	Straddle pike or side split jump with 1 turn
9	Switch leap to ring position
10	Stag jump

Table 1: Categories of FX-S1 (*leap-jump-hop in floor exercise*) from *Gym99*. “Johnson” denotes “*leap forward with leg change and 0.25 turn to side split position*”.

UB-S1 from <i>Gym99</i>	
Label ID	Category name
0	Pike sole circle bwd with 1.5 turn to hstd
1	Pike sole circle bwd with 0.5 turn to hstd
2	Pike sole circle bwd to hstd
3	Giant circle bwd with 1 turn to hstd
4	Giant circle bwd with 0.5 turn to hstd
5	Giant circle bwd
6	Giant circle fwd with 1 turn on one arm to hstd
7	Giant circle fwd with 0.5 turn to hstd
8	Giant circle fwd
9	Clear hip circle bwd to hstd
10	Clear pike circle bwd with 1 turn to hstd
11	Clear pike circle bwd with 0.5 turn to hstd
12	Clear pike circle bwd to hstd
13	Stalder bwd with 1 turn to hstd
14	Stalder bwd to hstd

Table 2: Categories of UB-S1 (*the-circles in floor exercise*) from *Gym99*. “bwd”, “fwd” and “hstd” are abbreviations of backward, forward and handstand respectively.

2.2. Dataset statistics

We present the histogram of element classes in *FineGym* and its subsets (*Gym288* and *Gym99*) in Figure 3. We can

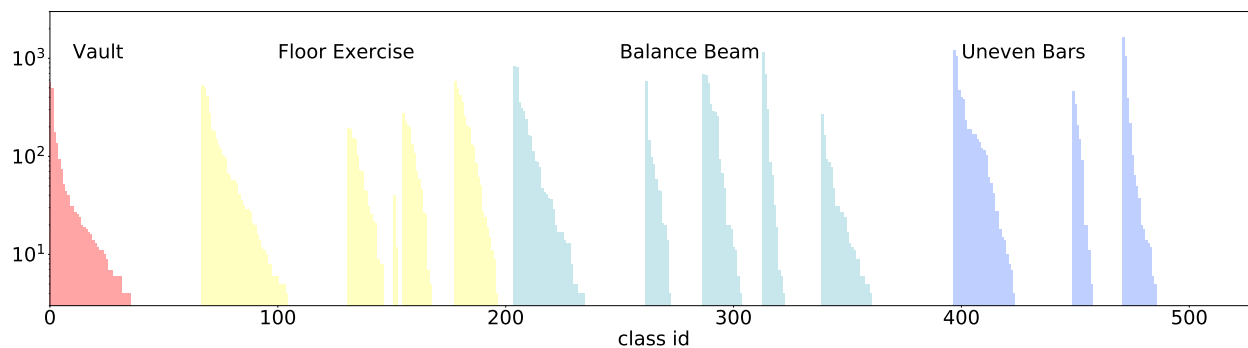
see that the *FineGym* is naturally long-tailed while *Gym99* is relatively balanced.

2.3. Details of decision-trees

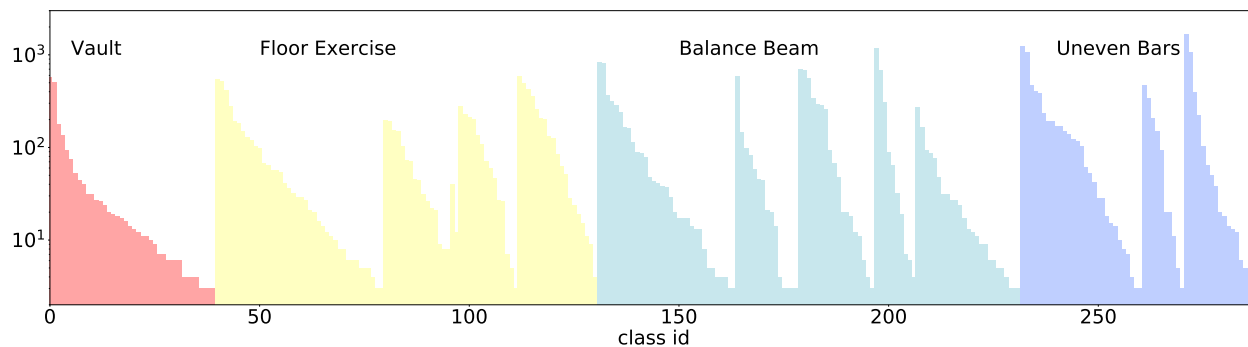
In Listing 1, we present a full decision tree of UB-S1 in text format. The procedure runs as follows: given a video clip, we start from Q1 and decide whether the answer is yes or no. Different answers yield to different questions to follow. Traveling through the decision tree, the procedure ends at a leaf node, denoted by C_{xx} , which is the final element label. We also present a demo video in the second part of 4252_demo.mp4 to visualize the procedure.

2.4. List of FineGym Sub-Action Classes

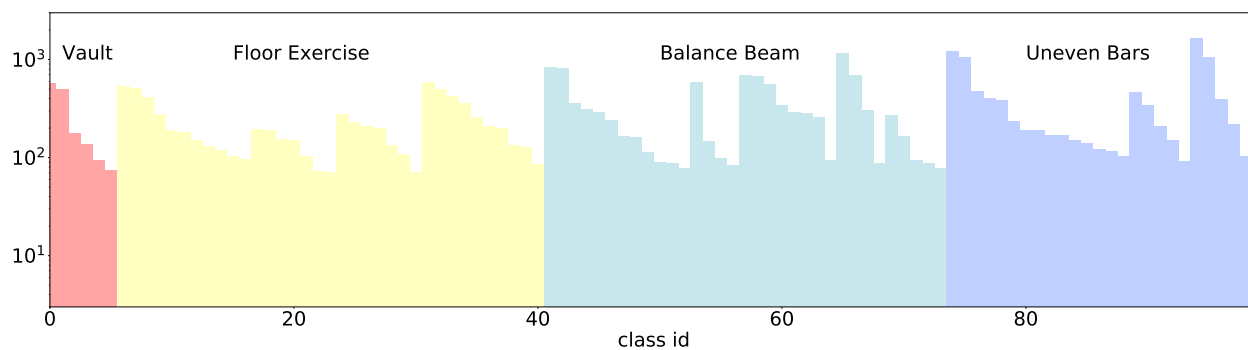
In Table 3, we present the category name for all classes in the *FineGym* dataset. We also provide the class id of each category in the subsets *Gym288* and *Gym99* respectively.



(a) All classes



(b) *Gym288*



(c) *Gym99*

Figure 3: Frequency of element classes in (a) *FineGym* as well as its subset: (b) *Gym288* and (c) *Gym99* w.r.t. sub-action instances.

Q1: Toes touch the bar during circle (sole circle)? If yes, goto Q2; If no, goto Q13.
Q2: Two legs are together when toes on bar (pike sole circle)?
If yes, goto Q3; If no, goto Q11.
Q3: Circle backward? If yes, goto Q4; If no, goto Q8.
Q4: To handstand? If yes, goto Q5; If no, goto C5.
Q5: Either 1 turn or 1.5 turn ? If yes, goto Q6; If no, goto Q7.
Q6: 1.5 turn? If yes, goto C1; If no, go to C2.
Q7: 0.5 turn? If yes, goto C3; If no, go to C4.
Q8: To handstand? If yes, goto Q9; If no, goto C9.
Q9: 1 turn? If yes, goto C6; If no, goto Q10.
Q10: 0.5 turn? If yes, goto C7; If no, goto Q8.
Q11: End with toes on bar? If yes, goto Q12; If no, trigger warning.
Q12: Circle backward? If yes, goto C10; If no, goto C11.
Q13: Giant circle? If yes, goto Q14; If no, goto Q27.
Q14: Circle backward? If yes, goto Q15; If no, goto Q23.
Q15: With turn before handstand phase? If yes, goto Q16; If no, goto Q21.
Q16: Either 1.5 turn or 2 turn? If yes, goto Q17; If no, goto Q18.
Q17: 2 turn? If yes, goto C12; If no, goto C13.
Q18: Either 1 turn or hop 1 turn? If yes, goto Q19; If no, goto Q20.
Q19: Hop 1 turn? If yes, goto C14; If no, goto C15.
Q20: Turn on one arm? If yes, goto C16; If no, goto C17.
Q21: Start and finish in clear rear support? If yes, goto C18; If no, goto Q22.
Q22: Circle on one arm? If yes, goto C19; If no, goto C20.
Q23: With turn before handstand phase? If yes, goto Q24; If no, goto C25.
Q24: 1 turn (either on one arm or use both arms)? If yes, goto Q25; If no, goto Q26.
Q25: 1 turn on one arm? If yes, goto C21; If no, goto C22.
Q26: 1.5 turn? If yes, goto C23; If no, goto C24.
Q27: Either hip circle or clear hip circle? If yes, goto Q28; If no, goto Q35.
Q28: To handstand? If yes, goto Q29; If no, goto Q34.
Q29: Circle backward? If yes, goto Q30; If no, goto Q33.
Q30: Either 1 turn or 1.5 turn? If yes, goto Q31; If no, goto Q32.
Q31: 1.5 turn? If yes, goto C26; If no, goto C27.
Q32: 0.5 turn? If yes, goto C28; If no, goto C29.
Q33: Forward circle with 0.5 turn? If yes, goto C30; If no, goto C31.
Q34: Circle backward (to front support)? If yes, goto C32; If no, goto C33.
Q35: Pike circle (with two legs together)? If yes, goto Q36; If no, goto Q45.
Q36: Pike circle backward? If yes, goto Q37; If no, goto Q42.
Q37: With turn? If yes, goto Q38; If no, goto Q40.
Q38: 1.5 turn? If yes, goto C34; If no, goto Q39.
Q39: 1 turn? If yes, goto C35; If no, goto C36.
Q40: Circle starts from handstand phase? If yes, goto Q41; If no, goto C39.
Q41: To handstand? If yes, goto C37; If no, goto C38.
Q42: With turn? If yes, goto Q43; If no, goto Q44.
Q43: 1 turn? If yes, goto C40; If no, goto C41.
Q44: To handstand (also start from handstand)? If yes, goto C42; If no, goto C43.
Q45: Straddle circle (with legs wide apart)? If yes, goto Q46; If no, trigger warning.
Q46: Circle backward? If yes, goto Q47; If no, go to Q51.
Q47: With turn? If yes, goto Q48; If no, go to Q50.
Q48: 1.5 turn? If yes, goto C44; If no, go to Q49.
Q49: 1 turn? If yes, goto C45; If no, go to Q46.
Q50: To handstand? If yes, goto C47; If no, go to C48.
Q51: With turn? If yes, goto Q52; If no, go to Q53.
Q52: 1 turn? If yes, goto C49; If no, go to C50.
Q53: To handstand? If yes, goto C51; If no, go to C52.

C1: Pike sole circle backward with 1.5 turn to handstand; code: 5.508; DV: 0.5.
C2: Pike sole circle backward with 1 turn to handstand; code: 5.408; DV: 0.4.
C3: Pike sole circle backward with 0.5 turn to handstand; code: 5.308; DV: 0.3.
C4: Pike sole circle backward to handstand; code: 5.308; DV: 0.3.
C5: Pike sole circle backward (end with toes-on-bar); code: 5.108; DV: 0.1.
C6: Pike sole circle forward with 1 turn to handstand; code: 5.405; DV: 0.4.
C7: Pike sole circle forward with 0.5 turn to handstand; code: 5.305; DV: 0.3.
C8: Pike sole circle forward to handstand; code: 5.305; DV: 0.3.
C9: Pike sole circle forward (end with toes-on-bar); code: 5.105; DV: 0.1.
C10: Straddle sole circle backward (end with toes-on-bar); code: 5.108; DV: 0.1.
C11: Straddle sole circle forward (end with toes-on-bar); code: 5.105; DV: 0.1.
C12: Giant circle backward with 2 turn to handstand; code: 3.401; DV: 0.4.
C13: Giant circle backward with 1.5 turn to handstand; code: 3.401; DV: 0.4.
C14: Giant circle backward with hop 1 turn to handstand; code: 3.401; DV: 0.4.
C15: Giant circle backward with 1 turn to handstand; code: 3.301; DV: 0.3.
C16: Giant circle backward on one arm with 0.5 turn to handstand; code: 3.201; DV: 0.2
C17: Giant circle backward with 0.5 turn to handstand; code: 3.201; DV: 0.2.
C18: Clear rear pike support with legs together, full circle swing backward to finish in clear rear support; code: 5.302; DV: 0.3.
C19: Giant circle backward on one arm; code: 3.201; DV: 0.2.
C20: Giant circle backward; code: 3.201; DV: 0.2.
C21: Giant circle forward with 1 turn on one arm to handstand; code: 3.506; DV: 0.5.
C22: Giant circle forward with 1 turn to handstand; code: 3.306; DV: 0.3.
C23: Giant circle forward to handstand with 1.5 turn before handstand phase; code: 3.506; DV : 0.5.
C24: Giant circle forward with 0.5 turn to handstand; code: 3.206; DV: 0.2.
C25: Giant circle forward; code: 3.206; DV: 0.2.
C26: Clear hip circle backward with 1.5 turn to handstand; code: 2.505; DV: 0.5.
C27: Clear hip circle backward with 1 turn to handstand; code: 2.405; DV: 0.4.
C28: Clear hip circle backward with 0.5 turn to handstand; code: 2.305; ; DV: 0.3
C29: Clear hip circle backward to handstand; code: 2.305; DV: 0.3.
C30: Clear hip circle forward with 0.5 turn to handstand phase; code: 2.404; ; DV: 0.4.
C31: Clear hip circle forward to handstand; code: 2.404; DV: 0.4.
C32: Hip circle backward--hips touching bar; code: 2.105; ; DV: 0.1.
C33: Hip circle forward--hips touching bar; code: 2.104; ; DV: 0.1.
C34: Clear pike circle backward with 1.5 turn to handstand; code: 4.507; ; DV: 0.5.
C35: Clear pike circle backward with 1 turn to handstand; code: 4.507; DV: 0.5.
C36: Clear pike circle backward with 0.5 turn to handstand; code: 4.407; DV: 0.4.
C37: Clear pike circle backward to handstand; code: 4.407; ; DV: 0.4.
C38: From handstand clear pike circle backward to rear inverted pike support; code: 4.407; DV: 0.4.
C39: Seat/pike circle backward to rear support; code: 4.107; DV: 0.1.
C40: Clear pike circle forward with 1 turn to handstand; code: 4.506; DV: 0.5.
C41: Clear pike circle forward with 0.5 turn to handstand; code: 4.406; DV: 0.4.
C42: Clear pike circle forward to handstand; code: 4.406; DV: 0.4.
C43: Seat/pike circle forward to rear support; code: 4.106; DV: 0.1.
C44: Stalder backward with 1.5 turn to handstand; code: 4.504; DV: 0.5.
C45: Stalder backward with 1 turn to handstand; code: 4.404; DV: 0.4.
C46: Stalder backward with 0.5 turn to handstand; code: 4.304; DV: 0.3
C47: Stalder backward to handstand; code: 4.304; DV: 0.3.
C48: Clear straddle circle backward to clear support; code: 4.104; DV: 0.1.
C49: Stalder forward with 1 turn to handstand; code: 4.401; DV: 0.4.
C50: Stalder forward with 0.5 turn to handstand; code: 4.301; DV: 0.3.
C51: Stalder forward to handstand; code: 4.301; DV: 0.3.
C52: Clear straddle circle forward to clear support; code: 4.101; DV: 0.1.

Listing 1: Details of the decision tree of UB-S1 (*The Circles in Uneven bars*) shown in text format.

Class ID	Class name	# in Gym99	# in Gym288
0	(VT) Round-off, flic-flac with 0.5 turn on – straight salto fwd with 1.5 twist off	-	0
1	(VT) Round-off, flic-flac with 0.5 turn on – straight salto fwd with 0.5 twist off	0	1
2	(VT) Round-off, flic-flac with 0.5 turn on – straight salto fwd with 1 twist off	-	2
3	(VT) Round-off, flic-flac with 0.5 turn on – straight salto fwd with 2 twist off	-	3
4	(VT) Round-off, flic-flac with 0.5 turn on – straight salto fwd off	-	-
5	(VT) Round-off, flic-flac with 0.5 turn on – half twist to piked salto bwd off	-	4
6	(VT) Round-off, flic-flac with 0.5 turn on – piked salto fwd with 1.5 twist off	-	-
7	(VT) Round-off, flic-flac with 0.5 turn on – piked salto fwd with 0.5 twist off	-	5
8	(VT) Round-off, flic-flac with 0.5 turn on – piked salto fwd with 1 twist off	-	-
9	(VT) Round-off, flic-flac with 0.5 turn on – piked salto fwd off	-	6
10	(VT) Round-off, flic-flac with 0.5 turn on – tucked salto fwd with 1.5 twist off	-	-
11	(VT) Round-off, flic-flac with 0.5 turn on – tucked salto fwd with 0.5 twist off	-	7
12	(VT) Round-off, flic-flac with 0.5 turn on – tucked salto fwd with 1 twist off	-	-
13	(VT) Round-off, flic-flac with 0.5 turn on – tucked salto fwd off	-	-
14	(VT) Round-off, flic-flac with 0.75 turn on – straight salto bwd with 1 twist off	-	8
15	(VT) Round-off, flic-flac with 0.75 turn on – straight salto bwd off	-	-
16	(VT) Round-off, flic-flac with 0.75 turn on – piked salto bwd off	-	9
17	(VT) Round-off, flic-flac with 0.75 turn on – tucked salto bwd with 1 twist off	-	-
18	(VT) Round-off, flic-flac with 0.75 turn on – tucked salto bwd off	-	-
19	(VT) Round-off, flic-flac on – straight salto bwd with 2 twist off	1	10
20	(VT) Round-off, flic-flac on – straight salto bwd with 1 twist off	2	11
21	(VT) Round-off, flic-flac on – straight salto bwd with 1.5 twist off	3	12
22	(VT) Round-off, flic-flac on – straight salto bwd with 0.5 twist off	-	13
23	(VT) Round-off, flic-flac on – straight salto bwd with 2.5 twist off	4	14
24	(VT) Round-off, flic-flac on – straight salto bwd off	5	15
25	(VT) Round-off, flic-flac on – piked salto bwd off	-	16
26	(VT) Round-off, flic-flac on – tucked salto bwd with 1 twist	-	-
27	(VT) Round-off, flic-flac on – tucked salto bwd with 1.5 twist	-	-
28	(VT) Round-off, flic-flac on – tucked salto bwd with 0.5 twist	-	-
29	(VT) Round-off, flic-flac on – tucked salto bwd off	-	17
30	(VT) Tsukahara straight with double twist	-	18
31	(VT) Tsukahara straight with 1 twist	-	19
32	(VT) Tsukahara straight with 1.5 twist	-	20
33	(VT) Tsukahara straight with 0.5 twist	-	21
34	(VT) Tsukahara straight with 2.5 twist	-	-
35	(VT) Tsukahara straight salto	-	22
36	(VT) Tsukahara straight without salto	-	23
37	(VT) Tsukahara piked	-	24
38	(VT) Tsukahara tucked with 1 twist	-	25
39	(VT) Tsukahara tucked with 1.5 twist	-	-
40	(VT) Tsukahara tucked with 0.5 twist	-	-
41	(VT) Tsukahara tucked	-	26
42	(VT) Handspring half twist on, half twist off	-	-
43	(VT) Handspring full twist on, full twist off	-	-
44	(VT) Handspring full twist on	-	-
45	(VT) Handspring fwd on – straight salto fwd with 1.5 twist off	-	27
46	(VT) Handspring fwd on – straight salto fwd with 0.5 twist off	-	28
47	(VT) Handspring fwd on – straight salto fwd with 1 twist off	-	29
48	(VT) Handspring fwd on – straight salto fwd off	-	-
49	(VT) Handspring fwd on - 0.5 twist to piked salto backward off	-	-
50	(VT) Handspring fwd on – piked salto fwd with 1.5 twist off	-	-
51	(VT) Handspring fwd on – piked salto fwd with 0.5 twist off	-	30
52	(VT) Handspring fwd on – piked salto fwd with 1 twist off	-	31
53	(VT) Handspring fwd on – piked salto fwd off	-	32
54	(VT) Handspring fwd on - 0.5 twist to tucked salto backward off	-	-
55	(VT) Handspring fwd on – tucked salto fwd with 1.5 twist off	-	-
56	(VT) Handspring fwd on – tucked salto fwd with 0.5 twist off	-	33
57	(VT) Handspring fwd on – tucked salto fwd with 1 twist off	-	34
58	(VT) Handspring fwd on – tucked double salto fwd off	-	35
59	(VT) Handspring fwd on – tucked salto fwd off	-	36
60	(VT) Handspring forward on, 0.5 twist off	-	37
61	(VT) Handspring forward on, 2 twist off	-	-
62	(VT) Handspring forward on, 1 twist off	-	38
63	(VT) Handspring forward on	-	39
64	(VT) Yamashita with half twist off	-	-
65	(VT) Yamashita with full twist off	-	-
66	(VT) Yamashita-piked to straight without salto off	-	-
67	(FX) Switch leap with 0.5 turn	6	40
68	(FX) Switch leap with 1 turn	7	41
69	(FX) Fouette Hop with leg change to cross split to land on one foot	-	-
70	(FX) Split leap with 0.5 turn	-	42
71	(FX) Split leap with 1 turn to land in split sit position	-	-
72	(FX) Split leap with 1 turn	8	43
73	(FX) Split leap with 1.5 turn or more	9	44
74	(FX) Leap fwd with leg change to cross split (Switch leap)	10	45
75	(FX) Split leap fwd	-	46
76	(FX) Tuck jump with separation of legs to cross split during flight phase	-	-
77	(FX) Split Jump with 1 turn	11	47
78	(FX) Split Jump with 0.5 turn	-	48
79	(FX) Split Jump with 1.5 turn	-	49
80	(FX) Sissone: leg separation 180° on the diagonal to the floor, take off two feet, land on one foot	-	50
81	(FX) Split jump (leg separation 180°)	12	51
82	(FX) Johnson with additional 1 turn	-	-
83	(FX) Johnson with additional 0.5 Turn	13	52
84	(FX) Leap fwd with 0.25 turn into straddle pike position with 1 turn	-	-
85	(FX) Switch leap with 0.25 turn to side split or to straddle pike position (Johnson)	-	53
86	(FX) Leap fwd with 0.25 turn into straddle pike or side split position	-	-
87	(FX) Straddle pike or side split jump with 1 turn landing in front lying support	-	-
88	(FX) Straddle pike or side split jump with 1 turn	14	54
89	(FX) Straddle pike or side split jump with 0.5 turn landing in front lying support	-	-
90	(FX) Straddle pike or side split jump with 0.5 turn	-	55
91	(FX) Straddle pike or side split jump with 1.5 turn	-	-
92	(FX) Straddle pike jump or side split jump landing in front lying support	-	-
93	(FX) Straddle pike jump or side split jump	-	56
94	(FX) Stag ring jump: rear foot at head height, body arched and head dropped bwd	-	57
95	(FX) Switch leap to ring position with 1 turn	-	58
96	(FX) Switch leap to ring position	15	59

97	(FX) Split leap with 1 turn or more to ring position	-	60
98	(FX) Split ring leap	-	61
99	(FX) Ring jump	-	62
100	(FX) Split ring jump with 0.5 turn	-	-
101	(FX) Split jump with 1 turn or more to ring position	-	63
102	(FX) Split ring jump	-	-
103	(FX) Stag jump with 0.5 turn	-	64
104	(FX) Stag jump	16	65
105	(FX) Tuck hop or jump with 2 turn landing in front lying support	-	-
106	(FX) Tuck hop or jump with 1 turn	-	66
107	(FX) Tuck hop or jump with 2 turn	-	67
108	(FX) Stretched hop or jump with 1 turn	-	68
109	(FX) Stretched hop or jump with 1 turn	-	-
110	(FX) Pike jump with 1 turn	-	69
111	(FX) Pike jump	-	-
112	(FX) Sheep jump: Jump with upper back arch and head release with feet almost touching head	-	70
113	(FX) Wolf hop or jump with 1 turn landing in front lying support	-	-
114	(FX) Wolf hop or jump with 1 turn	-	71
115	(FX) Wolf hop or jump with 2 turn	-	-
116	(FX) Stride leap fwd with change of legs to wolf position	-	72
117	(FX) Wolf hop or jump: Hop or Jump with one leg bent and the other extended straight, fwd above horizontal with knees together	-	73
118	(FX) Straddle pike or side split jump landing in front lying support with 0.5 turn	-	-
119	(FX) Straddle pike or side split jump landing in front lying support with 1 turn	-	-
120	(FX) Straddle pike or side split jump landing in front lying support	-	74
121	(FX) Hop with 1 turn to straddle and land in front lying support	-	-
122	(FX) Hop with 1.5 turn in horizontal plane to land in front lying support	-	-
123	(FX) Cat leap with 1 turn: Leap with alternate leg change with 1 turn	-	-
124	(FX) Cat leap with 2 turn: Leap with alternate leg change with 2 turn	-	75
125	(FX) Cat leap: Leap with alternate leg change	-	76
126	(FX) Fouetté-hop to land in arabesque	-	-
127	(FX) Hop with 0.5 turn, free leg extended above horizontal throughout	-	77
128	(FX) Hop with 1 turn, free leg extended above horizontal throughout	-	78
129	(FX) Butterfly fwd: torso parallel to floor, slightly arched, legs straddled and feet above hip height during flight	-	79
130	(FX) Butterfly bwd: torso parallel to floor, slightly arched, legs straddled and feet above hip height during flight	-	-
131	(FX) Illusion 1 turn through standing split	-	80
132	(FX) Illusion 2 turn through standing split	-	-
133	(FX) 3 turn with free leg held upward in 180 degree split position throughout turn	-	81
134	(FX) 2 turn with free leg held upward in 180 degree split position throughout turn	17	82
135	(FX) 1 turn with free leg held upward in 180 degree split position throughout turn	-	83
136	(FX) 3 turn in tuck stand on one leg, free leg straight throughout turn	-	84
137	(FX) 2 turn in tuck stand on one leg, free leg straight throughout turn	18	85
138	(FX) 2 turn in tuck stand on one leg, free leg bent	-	-
139	(FX) 1 turn in tuck stand on one leg, free leg optional	-	86
140	(FX) 2 spin or more on back in kip position, hip-leg < closed	-	-
141	(FX) 1 spin or less on back in kip position, hip-leg < closed	-	87
142	(FX) 1 turn with leg held backward and upward	-	-
143	(FX) 2 turn in back attitude, knee of free leg at horizontal throughout turn	-	88
144	(FX) 1 turn in back attitude, knee of free leg at horizontal throughout turn	-	89
145	(FX) 4 turn on one leg, free leg optional below horizontal	-	90
146	(FX) 3 turn on one leg, free leg optional below horizontal	19	91
147	(FX) 2 turn on one leg, free leg optional below horizontal	20	92
148	(FX) 1 turn on one leg, free leg optional below horizontal	21	93
149	(FX) 2 turn or more with heel of free leg fwd at horizontal throughout turn	22	94
150	(FX) 1 turn with heel of free leg fwd at horizontal throughout turn	23	95
151	(FX) Salto swd piked, take-off fwd from one or both legs	-	96
152	(FX) Salto swd piked, take-off fwd from one or both legs	-	-
153	(FX) Aerial round-off	-	-
154	(FX) Aerial cartwheel	-	97
155	(FX) Arabian double salto tucked with 0.5 twist	-	-
156	(FX) Arabian double salto tucked	24	98
157	(FX) Arabian salto tucked	-	-
158	(FX) Double salto fwd tucked with 0.5 twist	-	99
159	(FX) Double salto fwd tucked	-	100
160	(FX) Salto fwd tucked with 1 twist	-	-
161	(FX) Salto fwd tucked with 1.5 twist	-	-
162	(FX) Salto fwd tucked with 0.5 twist	-	-
163	(FX) Salto fwd tucked	25	101
164	(FX) Arabian double salto piked	-	102
165	(FX) Arabian salto piked	-	-
166	(FX) Double salto fwd piked	-	103
167	(FX) Salto fwd piked with 0.5 twist	-	-
168	(FX) Salto fwd piked	-	104
169	(FX) Aerial walkover fwd	26	105
170	(FX) Arabian double salto stretched	-	-
171	(FX) Salto fwd stretched with 2 twist	27	106
172	(FX) Salto fwd stretched with 1 twist	28	107
173	(FX) Salto fwd stretched with 2.5 twist	-	-
174	(FX) Salto fwd stretched with 1.5 twist	29	108
175	(FX) Salto fwd stretched with 0.5 twist	-	109
176	(FX) Salto fwd stretched, feet land successively	-	110
177	(FX) Salto fwd stretched, feet land together	30	111
178	(FX) Double salto bwd stretched with 2 twist	-	112
179	(FX) Double salto bwd stretched with 1 twist	-	113
180	(FX) Double salto bwd stretched with 0.5 twist	-	114
181	(FX) Double salto bwd stretched	31	115
182	(FX) Salto bwd stretched with 3 twist	32	116
183	(FX) Salto bwd stretched with 2 twist	33	117
184	(FX) Salto bwd stretched with 1 twist	-	118
185	(FX) Salto bwd stretched	-	119
186	(FX) Salto bwd stretched with 3.5 twist	-	120
187	(FX) Salto bwd stretched with 2.5 twist	34	121
188	(FX) Salto bwd stretched with 1.5 twist	35	122
189	(FX) Salto bwd stretched with 0.5 twist	-	123
190	(FX) Double salto bwd tucked with 3 twist	-	-
191	(FX) Double salto bwd tucked with 2 twist	36	124
192	(FX) Double salto bwd tucked with 1 twist	37	125
193	(FX) Double salto bwd tucked with 2.5 twist	-	-
194	(FX) Double salto bwd tucked with 1.5 twist	-	-

195	(FX) Double salto bwd tucked	38	126
196	(FX) Salto bwd tucked 1 twist	-	-
197	(FX) Salto bwd tucked	-	127
198	(FX) Double salto bwd piked with 1 twist	39	128
199	(FX) Double salto bwd piked	40	129
200	(FX) salto bwd piked	-	-
201	(FX) Whip salto bwd with 1 twist	-	-
202	(FX) Whip salto bwd with 0.5 twist	-	-
203	(FX) Whip salto bwd	-	130
204	(BB) Side Yang-Bo: Yang-Bo in side position	-	-
205	(BB) Yang-Bo: Jump to cross over split with body arched and head dropped bwd	-	131
206	(BB) Sissone in side position	-	-
207	(BB) Sissone: leg separation 180 degree on the diagonal to the floor, take off two feet, land on one foot	41	132
208	(BB) Split jump with 0.5 turn in side position	42	133
209	(BB) Split jump with 0.5 turn	-	134
210	(BB) Split jump with 1 turn in side position	-	-
211	(BB) Split jump with 1 turn	-	135
212	(BB) Split jump in side position	-	-
213	(BB) Split jump	43	136
214	(BB) Straddle pike jump with 0.5 turn in side position	-	137
215	(BB) Straddle pike jump with 0.5 turn	-	138
216	(BB) Straddle pike jump with 1 turn in side position	-	-
217	(BB) Straddle pike jump with 1 turn	-	139
218	(BB) Straddle pike jump or side split jump, in side position	-	140
219	(BB) Straddle pike jump or side split jump	44	141
220	(BB) Stag-ring jump	-	142
221	(BB) Ring jump: rear foot at head height, body arched and head dropped bwd, 180 separation of legs	-	143
222	(BB) Split ring jump: ring jump with front leg horizontal to the floor	45	144
223	(BB) Switch Leap with 0.5 turn	46	145
224	(BB) Switch Leap with 1 turn	-	146
225	(BB) Foutte hop with leg change to cross split	-	-
226	(BB) Split leap with 0.5 turn	-	-
227	(BB) Split leap with 1 turn	-	147
228	(BB) Switch leap: leap forward with leg change, free leg swing to 45 to cross split	47	148
229	(BB) Stag Split leap fwd	-	149
230	(BB) Split leap fwd	48	150
231	(BB) Johnson with additional 0.5 turn	-	151
232	(BB) Johnson: leap forward with leg change and 0.25 turn to side split or straddle pike position	49	152
233	(BB) Leap with 0.25 turn into straddle pike position	-	-
234	(BB) Switch leap to ring position	50	153
235	(BB) Split ring leap	-	154
236	(BB) Tuck hop or jump with 1 turn in side position	-	-
237	(BB) Tuck hop or jump with 1 turn	-	155
238	(BB) Tuck hop or jump with 1.5 turn in side position	-	-
239	(BB) Tuck hop or jump with 1.5 turn	-	-
240	(BB) Tuck hop or jump with 0.5 turn in side position	-	-
241	(BB) Tuck hop or jump with 0.5 turn, hip and knee angle at 45	-	156
242	(BB) Tuck hop or jump with 0.75 turn, hip and knee angle at 45	-	-
243	(BB) Pike jump from cross position with 0.5 turn in side position	-	-
244	(BB) Pike jump from cross position with 0.5 turn	-	-
245	(BB) Pike jump with 1 turn in side position	-	-
246	(BB) Pike jump from cross position with 1 turn	-	-
247	(BB) Pike jump in side position	-	-
248	(BB) Pike jump from cross position	-	157
249	(BB) Stretched jump/hop with 1 turn	-	158
250	(BB) Stretched jump/hop with 1.5 turn	-	-
251	(BB) Sheep jump: jump with upper back arch and head release with feet to head height/closed Ring	51	159
252	(BB) Wolf hop or jump with 1 turn	-	160
253	(BB) Wolf hop or jump with 1.5 turn	-	-
254	(BB) Wolf hop or jump with 0.5 turn	-	161
255	(BB) Stride leap fwd with change of legs to wolf position, hip angle at 45	-	-
256	(BB) Wolf hop or jump: hip angle at 45, knees together	52	162
257	(BB) Cat leap with 0.5 turn	-	-
258	(BB) Cat leap with 1 turn	-	-
259	(BB) Cat leap: knees above horizontal alternately	-	163
260	(BB) Fouetté hop with 0.5 turn to land in arabesque, free leg above horizontal	-	-
261	(BB) Hop with 0.5 turn, free leg extended above horizontal throughout	-	-
262	(BB) 0.5 illusion turn through standing split	-	-
263	(BB) 1 illusion turn through standing split	-	164
264	(BB) 1.5 turn with free leg held upward in 180 split position throughout turn	-	165
265	(BB) 1 turn with free leg held upward in 180 split position throughout turn	-	166
266	(BB) 1.5 turn with heel of free leg fwd at horizontal throughout turn	-	167
267	(BB) 2 turn with heel of free leg fwd at horizontal throughout turn	-	168
268	(BB) 1 turn with heel of free leg fwd at horizontal throughout turn	53	169
269	(BB) 3 turn on one leg, free leg optional below horizontal	-	-
270	(BB) 2 turn on one leg, free leg optional below horizontal	54	170
271	(BB) 1.5 turn on one leg, free leg optional below horizontal	-	171
272	(BB) 1 turn on one leg, free leg optional below horizontal	55	172
273	(BB) 1 turn pirouette with free leg held bwd with both hands	-	-
274	(BB) 1.5 turn on one leg, thigh of free leg at horizontal, bwd upward throughout turn	-	-
275	(BB) 1 turn on one leg, thigh of free leg at horizontal, bwd upward throughout turn	-	173
276	(BB) 2.5 turn in tuck stand on one leg	-	174
277	(BB) 1.5 turn in tuck stand on one leg	-	175
278	(BB) 3 turn in tuck stand on one leg	-	176
279	(BB) 2 turn in tuck stand on one leg	56	177
280	(BB) 1 turn in tuck stand on one leg	-	178
281	(BB) 1 turn in knee arabesque, hand support alternate	-	-
282	(BB) 2 turn in knee arabesque, hand support alternate	-	-
283	(BB) 1 turn in knee arabesque, hand support alternate	-	-
284	(BB) 1.5 turn in prone position, alternate support of hands permitted	-	-
285	(BB) 1 turn in prone position, alternate support of hands permitted	-	-
286	(BB) 1.25 turn on back in kip position, hip-leg angle closed	-	-
287	(BB) Gainer salto bwd tucked	-	-
288	(BB) Jump fwd with 0.5 twist and salto bwd tucked	-	179
289	(BB) Salto bwd tucked with 1 twist	57	180
290	(BB) Salto bwd tucked	58	181
291	(BB) Gainer salto bwd piked	-	-
292	(BB) Jump fwd with 0.5 twist – salto bwd piked	-	-

293	(BB) Salto bwd piked	-	182
294	(BB) Gainer salto bwd stretched, step out	-	183
295	(BB) Salto bwd stretched, step out, feet land successively	59	184
296	(BB) Salto bwd straight with 1 twist	-	185
297	(BB) Salto bwd straight with legs together	60	186
298	(BB) Free aerial Cartwheel in side position	-	-
299	(BB) Salto swd tucked with 0.5 turn take off from one leg to side stand	-	187
300	(BB) Salto swd tucked, take off from one leg to side stand	61	188
301	(BB) Free aerial cartwheel landing in side position	-	189
302	(BB) Free aerial round-off tucked, take off from 2 feet	-	-
303	(BB) Free aerial round-off piked, take off from 2 feet	-	-
304	(BB) Free aerial round-off	-	190
305	(BB) Free aerial cartwheel with leg change	-	-
306	(BB) Free aerial cartwheel landing in cross position	62	191
307	(BB) Arabian salto tucked-take-off bwd with 0.5 twist, salto fwd	-	192
308	(BB) Salto fwd tucked with 0.5 twist to cross stand	-	-
309	(BB) Salto fwd tucked to cross stand	63	193
310	(BB) Salto fwd piked to cross stand	-	194
311	(BB) Salto fwd tucked, take-off from one leg to stand on one or two feet	-	195
312	(BB) Free aerial walkover fwd, landing on one or both feet	64	196
313	(BB) Gainer flic-flac, with piking and stretching of hips in flight phase and swing down to cross straddle sit	-	-
314	(BB) Gainer flic-flac, with high flight phase, swing down to cross straddle sit	-	-
315	(BB) Flic-flac, with piking and stretching of hips in flight phase and swing down to cross straddle sit	-	-
316	(BB) Flic-flac with 1 twist, swing down to cross straddle sit	-	197
317	(BB) Flic-flac, swing down to cross straddle sit	-	198
318	(BB) Flic-flac from side position with 1 twist to hip circle bwd	-	-
319	(BB) Flic-flac from side position with hip circle bwd	-	-
320	(BB) Flic-flac from side position to front support	-	-
321	(BB) Flic-flac from side position with 0.5 twist to side hstd lower to optional end position	-	-
322	(BB) Flic-flac with step-out from side position	-	-
323	(BB) Gainer flic-flac with 0.25 twist to hstd - 2 sec. - lower to optional end position	-	-
324	(BB) Gainer flic-flac with min.0.75 twist before hand support	-	-
325	(BB) Gainer flic-flac also with support on one arm	-	199
326	(BB) Flic-flac with 0.75 twist to side hstd - 2 sec. - lower to optional end position	-	200
327	(BB) Flic-flac with 0.25 twist to hstd - 2 sec. - lower to optional end position	-	-
328	(BB) Flic-flac with 0.5 twist to hstd - 2 sec. - lower to optional end position	-	-
329	(BB) Flic-flac with min. 0.75 twist before hand support	-	201
330	(BB) Jump bwd - flic-flac take-off with 0.5 twist through hstd to tic-toc	-	-
331	(BB) Jump bwd - flic-flac take-off with 0.5 twist through hstd to walkover fwd	65	202
332	(BB) Jump bwd - flic-flac take-off with 0.5 twist to handspring fwd land on 2 feet	-	-
333	(BB) Flic-flac with 0.5 twist after hand support	-	-
334	(BB) Flic-flac to land on both feet	66	203
335	(BB) Flic-flac with step-out, also with support on one arm	67	204
336	(BB) Round-off	68	205
337	(BB) Handspring fwd with leg change in flight phase	-	-
338	(BB) Handspring fwd with flight to land on one or both legs, also with support on one arm	-	206
339	(BB) Arabian double salto fwd tucked	-	207
340	(BB) Double salto fwd tucked	-	-
341	(BB) Arabian salto tucked: Jump bwd, with 0.5 twist, salto fwd tucked	-	-
342	(BB) Stretched jump fwd with 1 twist and salto fwd tucked	-	-
343	(BB) Salto fwd tucked with 1 twist	-	208
344	(BB) Salto fwd tucked with 0.5 twist	-	-
345	(BB) Salto fwd tucked	-	209
346	(BB) Arabian salto piked: Jump bwd, with 0.5 twist, salto fwd piked	-	-
347	(BB) Stretched jump fwd with 1 twist and salto fwd piked	-	-
348	(BB) Salto fwd piked with 0.5 twist	-	-
349	(BB) Salto fwd piked	-	210
350	(BB) Salto fwd stretched with 1.5 twist	-	211
351	(BB) Salto fwd stretched with 0.5 twist	-	-
352	(BB) Salto fwd stretched with 2 twist	-	-
353	(BB) Salto fwd stretched with 1 twist	-	212
354	(BB) Stretched jump fwd with 1 twist and salto fwd stretched	-	-
355	(BB) Salto fwd stretched	-	213
356	(BB) Double salto bwd tucked with 1 twist	-	214
357	(BB) Double salto bwd tucked	69	215
358	(BB) Salto bwd tucked with 1 twist	-	216
359	(BB) Salto bwd tucked	70	217
360	(BB) Salto bwd tucked with 1.5 twist	-	218
361	(BB) Salto bwd tucked with 0.5 twist	-	-
362	(BB) Double salto bwd piked with 1 twist	-	-
363	(BB) Double salto bwd piked	71	219
364	(BB) Salto bwd piked	-	-
365	(BB) Salto bwd piked with 0.5 twist	-	-
366	(BB) Salto bwd stretched with 3 twist	-	220
367	(BB) Salto bwd stretched with 2 twist	72	221
368	(BB) Salto bwd stretched with 1 twist	-	222
369	(BB) Salto bwd stretched	-	223
370	(BB) Salto bwd stretched with 2.5 twist	73	224
371	(BB) Salto bwd stretched with 1.5 twist	-	225
372	(BB) Salto bwd stretched with 0.5 twist	-	226
373	(BB) Gainer salto tucked with 1 twist to side of beam	-	-
374	(BB) Gainer salto bwd tucked with 2 twist to side of beam	-	-
375	(BB) Gainer salto tucked to side of beam	-	-
376	(BB) Gainer salto tucked to side of beam with 0.5 twist	-	-
377	(BB) Gainer salto bwd tucked with 1.5 to side of beam	-	-
378	(BB) Gainer salto piked to side of beam	-	-
379	(BB) Gainer salto piked to side of beam with 0.5 twist	-	-
380	(BB) Gainer salto bwd stretched with 3 twist to side of beam	-	-
381	(BB) Gainer salto bwd stretched with 2 twist to side of beam	-	-
382	(BB) Gainer salto bwd stretched with 1 twist to side of beam	-	227
383	(BB) Gainer salto stretched to side of beam	-	-
384	(BB) Gainer salto bwd stretched with 2.5 twist to side of beam	-	-
385	(BB) Gainer salto bwd stretched with 1.5 to side of beam	-	-
386	(BB) Gainer salto stretched to side of beam with 0.5 twist	-	-
387	(BB) Gainer salto tucked with 1 twist at end of beam	-	-
388	(BB) Gainer salto tucked at end of beam	-	228
389	(BB) Gainer salto piked at end of beam	-	229
390	(BB) Gainer salto stretched with 1 twist at end of beam	-	230

391	(BB) Gainer salto stretched with legs together at end of the beam	-	231
392	(BB) Aerial cartwheel into salto bwd tucked	-	-
393	(BB) Aerial walkover fwd with 1.5 twist	-	-
394	(BB) Aerial walkover fwd with 0.5 twist	-	-
395	(BB) Aerial walkover fwd with 1 twist	-	-
396	(BB) Aerial walkover fwd	-	-
397	(UB) Pike sole circle backward with 1.5 turn to hstd	-	232
398	(UB) Pike sole circle backward with 1.5 turn to hstd	74	233
399	(UB) Pike sole circle backward with 0.5 turn to hstd	75	234
400	(UB) Pike sole circle bwd to handstand	76	235
401	(UB) Pike sole circle bwd (end with toes-on-bar)	-	-
402	(UB) Pike sole circle forward in with 1 turn to hstd	-	-
403	(UB) Pike sole circle fwd with 0.5 turn to hstd	-	236
404	(UB) Pike sole circle forward to handstand	-	-
405	(UB) Pike sole circle forward (end with toes-on-bar)	-	-
406	(UB) Straddle sole circle backward (end with toes-on-bar)	-	-
407	(UB) Straddle sole circle forward (end with toes-on-bar)	-	-
408	(UB) Giant circle bwd with 2 turn to hstd	-	-
409	(UB) Giant circle bwd with 1.5 turn to hstd	-	237
410	(UB) Giant circle bwd with hop 1 turn to hstd	-	238
411	(UB) Giant circle bwd with 1 turn to hstd	77	239
412	(UB) Giant circle bwd on one arm with 0.5 turn to hstd	-	-
413	(UB) Giant circle bwd with 0.5 turn to hstd	78	240
414	(UB) Clear rear pike support with legs together, full circle swing backward to finish in clear rear support	-	-
415	(UB) Giant circle bwd on one arm	-	-
416	(UB) Giant circle bwd	79	241
417	(UB) Giant circle fwd with 1 turn on one arm before to hstd	80	242
418	(UB) Giant circle fwd with 1 turn to hstd	-	243
419	(UB) Giant circle forward to handstand with 1.5 turn before handstand phase	-	244
420	(UB) Giant circle fwd with 0.5 turn to hstd	81	245
421	(UB) Giant circle fwd	82	246
422	(UB) Clear hip circle bwd with 1.5 turn to hstd	-	-
423	(UB) Clear hip circle bwd with 1 turn to hstd	-	247
424	(UB) Clear hip circle bwd with 0.5 turn to hstd	-	248
425	(UB) Clear hip circle bwd to hstd	83	249
426	(UB) Clear hip circle forward with 0.5 turn to handstand phase	-	250
427	(UB) Clear hip circle fwd to hstd	-	251
428	(UB) Hip circle bwd–hips touching bar	-	-
429	(UB) Hip circle fwd–hips touching bar	-	-
430	(UB) Clear pike circle bwd with 1.5 turn to hstd	-	-
431	(UB) Clear pike circle bwd with 1 turn to hstd	84	252
432	(UB) Clear pike circle bwd with 0.5 turn to hstd	85	253
433	(UB) Clear pike circle bwd to hstd	86	254
434	(UB) From hstd clear pike circle bwd to rear inverted pike support	-	-
435	(UB) Rear support – seat/pike circle bwd to rear support	-	-
436	(UB) Clear pike circle fwd with 1 turn to hstd	-	-
437	(UB) Clear pike circle fwd with 0.5 turn to hstd	-	-
438	(UB) Clear pike circle fwd to hstd	-	255
439	(UB) Rear support – seat/pike circle fwd to rear support	-	-
440	(UB) Stalder bwd with 1.5 turn to hstd	-	-
441	(UB) Stalder bwd with 1 turn to hstd	87	256
442	(UB) Stalder bwd with 0.5 turn to hstd	-	257
443	(UB) Stalder bwd to hstd	88	258
444	(UB) Clear straddle circle bwd to clear support	-	-
445	(UB) Stalder fwd with 1 turn to hstd	-	-
446	(UB) Stalder fwd with 0.5 turn to hstd	-	259
447	(UB) Stalder fwd to hstd	-	260
448	(UB) Clear straddle circle fwd to clear support	-	-
449	(UB) Stoop, straddle vault and 0.5 turn over HB to hang	-	-
450	(UB) (Swing bwd) with 0.5 turn and straddle flight bwd over HB to catch HB	-	261
451	(UB) 0.5 turn to counter straddle in flight over HB to hang	-	-
452	(UB) Counter straddle (reverse hecht over HB) with 0.5 turn to hang	-	262
453	(UB) Counter straddle (reverse hecht over HB) to hang	89	263
454	(UB) Stoop, pike vault and 0.5 turn over HB to hang	-	-
455	(UB) (Swing fwd with 0.5 turn) Pike vault over HB to hang	-	-
456	(UB) counter piked- reverse hecht over HB to hang	90	264
457	(UB) (Swing bwd) salto fwd tucked over HB to hang on HB	-	-
458	(UB) (Pike sole circle bwd) Counter stretched (reverse hecht) in layout position over HB to hang	-	265
459	(UB) (Swing forward or underswing with support of feet) Counter salto fwd straddled to catch on HB	-	-
460	(UB) (Swing fwd) 0.5 turn and salto fwd straddled	-	-
461	(UB) (Swing bwd) Salto fwd straddled with 0.5 turn to hang on HB	-	-
462	(UB) (Swing bwd or front support) Salto fwd straddled to hang on HB	91	266
463	(UB) (Swing bwd) 1 turn to hang on HB	-	-
464	(UB) (Underswing on HB or LB) 1.5 turn to hang	-	-
465	(UB) (Swing bwd) Salto fwd piked to hang on HB	92	267
466	(UB) (Swing fwd or hip circle backward) Salto bwd with 0.5 turn piked to hang on HB	93	268
467	(UB) (Swing bwd) Salto fwd tucked to hang on HB	-	-
468	(UB) (Swing bwd) Salto fwd stretched to hang on HB	-	269
469	(UB) (Swing fwd) Salto bwd stretched with 1.5 turn to hang on HB	-	-
470	(UB) (Swing fwd) Salto bwd stretched with 0.5 turn to hang on HB	-	270
471	(UB) Transition flight from high bar to low bar	94	271
472	(UB) Transition flight from low bar to high bar	95	272
473	(UB) Hip circle bwd on LB or HB, also clear – hecht with 0.5 turn to salto fwd	-	-
474	(UB) Hip circle bwd on LB or HB, also clear – hecht with 1 turn to salto fwd	-	-
475	(UB) Hip circle bwd on LB or HB, also clear – hecht with salto bwd tucked	-	-
476	(UB) Hip circle bwd on LB or HB, also clear – hecht with 1 turn	-	-
477	(UB) Hip circle bwd on LB or HB, also clear – hecht	-	-
478	(UB) Double salto bwd tucked with 1.5 turn	-	273
479	(UB) Salto tucked with 0.5 turn, into salto fwd tucked	-	274
480	(UB) Double salto bwd tucked with 2 turn	-	275
481	(UB) Double salto bwd tucked with 1 turn	96	276
482	(UB) Triple salto bwd tucked	-	-
483	(UB) Double salto bwd tucked	-	277
484	(UB) Double salto fwd tucked	97	278
485	(UB) Salto fwd with 0.5 turn into salto bwd tucked	-	279
486	(UB) Double salto fwd tucked with 0.5 turn	-	280
487	(UB) 0.5 turn to salto bwd tucked with 1 twist	-	-
488	(UB) Salto fwd tucked with 1.5 turn	-	-

489	(UB) 0.5 turn to salto bwd tucked	-	-
490	(UB) Salto fwd tucked with 1.5 turn	-	281
491	(UB) Salto fwd tucked with 1 turn	-	-
492	(UB) Salto fwd tucked	-	-
493	(UB) Salto bwd tucked with 0.5 turn	-	-
494	(UB) Salto bwd tucked with 1 turn	-	-
495	(UB) Salto bwd tucked	-	-
496	(UB) Salto fwd tucked with 1 turn	-	-
497	(UB) Salto fwd tucked with 0.5 turn	-	-
498	(UB) Salto fwd tucked	-	-
499	(UB) 0.5 turn to salto bwd piked	-	-
500	(UB) Salto fwd piked with 0.5 turn	-	-
501	(UB) Salto fwd piked with 1 turn	-	-
502	(UB) Salto fwd piked	-	-
503	(UB) 0.5 turn to double salto fwd piked	-	-
504	(UB) Double salto bwd piked with 1 turn in first or second salto	-	-
505	(UB) Double salto bwd piked	-	282
506	(UB) Swing fwd to salto bwd piked	-	-
507	(UB) From support on HB, salto bwd piked	-	-
508	(UB) Salto fwd piked	-	-
509	(UB) Double salto fwd piked with 0.5 turn	-	-
510	(UB) Salto bwd stretched with 0.5 turn – into salto fwd stretched	-	-
511	(UB) Salto bwd stretched with 2.5 turn	-	-
512	(UB) Salto bwd stretched with 1.5 turn	-	-
513	(UB) Salto bwd stretched with 0.5 turn	-	-
514	(UB) Double salto bwd stretched with 2 turn	-	283
515	(UB) Double salto bwd stretched with 1 turn	-	284
516	(UB) Double salto bwd stretched	98	285
517	(UB) Salto bwd stretched with 3 turn	-	-
518	(UB) Salto bwd stretched with 2 turn	-	286
519	(UB) Salto bwd stretched with 1 turn	-	-
520	(UB) Salto bwd stretched	-	287
521	(UB) Salto fwd stretched with 2 turn	-	-
522	(UB) Salto fwd stretched with 1 turn	-	-
523	(UB) Salto fwd stretched	-	-
524	(UB) 0.5 turn to salto bwd stretched	-	-
525	(UB) From support on HB, Salto fwd stretched with 0.5 turn	-	-
526	(UB) Salto fwd stretched with 1.5 turn	-	-
527	(UB) Swing bwd to salto fwd stretched with 0.5 turn	-	-
528	(UB) 0.5 turn to stand	-	-
529	(UB) 1 turn to stand	-	-

Table 3: List of all the element-level classes in *FineGym*. The relative class id in *Gym99* and *Gym288* is also provided.

References

- [1] Zhaowei Cai and Nuno Vasconcelos. Cascade r-cnn: Delving into high quality object detection. In *CVPR*, pages 6154–6162, 2018. [1](#)
- [2] Jia Deng, Wei Dong, Richard Socher, Li-Jia Li, Kai Li, and Li Fei-Fei. Imagenet: A large-scale hierarchical image database. In *CVPR*, pages 248–255. Ieee, 2009. [1](#)
- [3] Rohit Girdhar, Deva Ramanan, Abhinav Gupta, Josef Sivic, and Bryan Russell. Actionvlad: Learning spatio-temporal aggregation for action classification. In *CVPR*, pages 971–980, 2017. [1](#)
- [4] Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun. Deep residual learning for image recognition. In *CVPR*, pages 770–778, 2016. [1](#)
- [5] Sergey Ioffe and Christian Szegedy. Batch normalization: Accelerating deep network training by reducing internal covariate shift. *arXiv preprint arXiv:1502.03167*, 2015. [1](#)
- [6] Will Kay, Joao Carreira, Karen Simonyan, Brian Zhang, Chloe Hillier, Sudheendra Vijayanarasimhan, Fabio Viola, Tim Green, Trevor Back, Paul Natsev, et al. The kinetics human action video dataset. *arXiv preprint arXiv:1705.06950*, 2017. [1](#)
- [7] Ji Lin, Chuang Gan, and Song Han. Tsm: Temporal shift module for efficient video understanding. In *ICCV*, 2019. [1](#)
- [8] Karen Simonyan and Andrew Zisserman. Very deep convolutional networks for large-scale image recognition. *arXiv preprint arXiv:1409.1556*, 2014. [1](#)
- [9] Ke Sun, Bin Xiao, Dong Liu, and Jingdong Wang. Deep high-resolution representation learning for human pose estimation. *arXiv preprint arXiv:1902.09212*, 2019. [1](#)
- [10] Limin Wang, Yuanjun Xiong, Zhe Wang, Yu Qiao, Dahua Lin, Xiaoou Tang, and Luc Van Gool. Temporal segment networks for action recognition in videos. *IEEE transactions on pattern analysis and machine intelligence*, 2018. [1](#)
- [11] Xiaolong Wang, Ross Girshick, Abhinav Gupta, and Kaiming He. Non-local neural networks. In *CVPR*, pages 7794–7803, 2018. [1](#)
- [12] Sijie Yan, Yuanjun Xiong, and Dahua Lin. Spatial temporal graph convolutional networks for skeleton-based action recognition. In *Thirty-Second AAAI Conference on Artificial Intelligence*, 2018. [1](#)
- [13] Bolei Zhou, Alex Andonian, Aude Oliva, and Antonio Torralba. Temporal relational reasoning in videos. *ECCV*, 2018. [1](#)