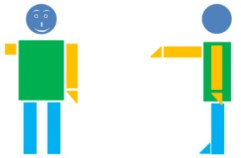
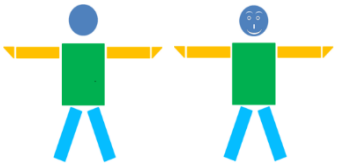
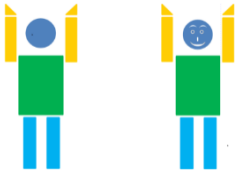
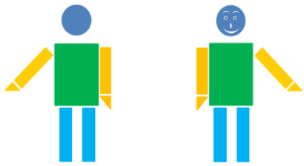
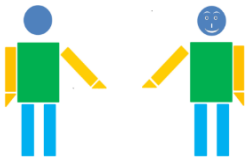
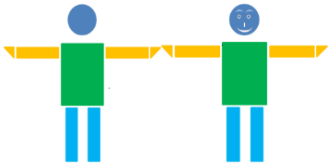
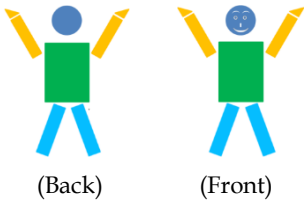
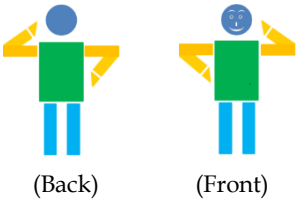
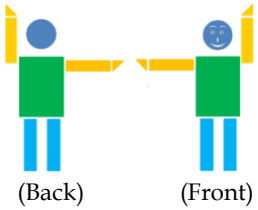
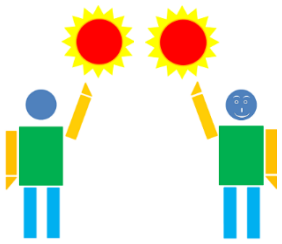
Supplementary Material

ID	Alphabets	Examples	Postures	Rules for recognition
P1	• (Dot)	冰 外 立	 (Front) (Side)	|(CShoulder.Z–RWrist.Z)–LOA|≤0.15 AND *LegsClosed*
P2	— (Horizontal line)	天 下 表	 (Back) (Front)	*LeftArmStraight* AND *LeftArmHorizontalLeft* AND *RightArmStraight* AND *RightArmHorizontalRight* AND *LegsOpen*
P3	| (Vertical line)	上 丁 中	 (Back) (Front)	(*LeftArmStraight* AND *LeftArmVerticalUp* AND *RightArmStraight* AND *RightArmVerticalUp* AND *LegsClosed*) OR (*TopOutofView* AND ∠((LElbow–LShoulder), (+Y))<15° AND ∠((RElbow–RShoulder), (+Y))<15° AND *LegsClosed*)
P4	／ (Left-falling)	千 才 川 充	 (Back) (Front)	*LeftArmStraight* AND ∠((LWrist–CShoulder), (Spine–CShoulder))∈[40°60°] AND *RightArmStraight* AND *RightArmVerticalDown* AND *LegsClosed*
P5	＼ (Right-falling)	大 代 建	 (Back) (Front)	*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightArmStraight* AND ∠((RWrist–CShoulder), Spine–CShoulder))∈[40° 60°] AND *LegsClosed*
P6	＋ (Plus)	孩 法 寸	 (Back) (Front)	*LeftArmStraight* AND *LeftArmHorizontalLeft* AND *RightArmStraight* AND *RightArmHorizontalRight* AND *LegsClosed*
P7	✗ (Cross)	文 犯 存 戈	 (Back) (Front)	*LeftArmStraight* AND ∠((LWrist–LShoulder), (+Y))∈[40° 60°] AND *RightArmStraight* AND ∠((RWrist–RShoulder), (+Y))∈[40° 60°] AND *LegsOpen*
P8	ㄣ (Curve)	角 陳 氣 及	 (Back) (Front)	*LeftWristAboveLeftShoulder* AND ∠((LWrist–LElbow), (LShoulder–LElbow))∈[40° 60°] AND *RightWristBelowRightShoulder* AND ∠((RWrist–RElbow), (RShoulder–RElbow))∈[40° 60°] AND *LegsClosed*
P9	ㄴ (Angle)	色 母 還	 (Back) (Front)	*LeftArmStraight* AND *LeftArmVerticalUp* AND *RightArmStraight* AND *RightArmHorizontalRight* AND *LegsClosed*

P10	(Arrow)	全 父 木 空	 (Back)	 (Front)	*LeftWristAboveLeftShoulder* AND ∠((LWrist–LElbow), (LShoulder–LElbow))∈[40° 60°] AND *RightWristAboveRightShoulder* AND ∠((RWrist–RElbow), (RShoulder–RElbow))∈[40° 60°] AND *LegsClosed*
P11	(Knob)	紋 女 矢 水	 (Back)	 (Front)	*LeftWristAboveLeftShoulder* AND∠ ((LWrist–LElbow), (LShoulder–LElbow))∈[40° 60°] AND *RightArmStraight* AND *RightArmVerticalDown* AND *LegsClosed*
P12	(Turn)	登 子 社 疋	 (Back)	 (Front)	*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightWristBelowRightShoulder* AND ∠((RWrist–RElbow), (RShoulder–RElbow))∈[40° 60°] AND *LegsClosed*
P13	(Hat)	月 字 朵	 (Back)	 (Front)	LWrist.Y>head.Y AND |LWrist.X–RWrist.X|<=0.15 AND RWrist.Y>head.Y AND *LegsClosed*
P14	(Weightlift)	山 廿 心	 (Back)	 (Front)	∠((LWrist–LElbow), (LShoulder –LElbow))∈[80° 100°] AND ∠((LWrist–LElbow), (+Y))<=15° AND ∠((RWrist–RElbow), (RShoulder–RElbow))∈[80° 100°] AND ∠((RWrist–RElbow), (+Y))<=15° AND *LegsClosed*
P15	(Corner)	成 戶	 (Back)	 (Front)	*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightArmStraight* AND *RightArmHorizontalRight* AND *LegsClosed*
P16	(Fold)	力 象 羽	 (Back)	 (Front)	*LeftArmStraight* AND *LeftArmHorizontalLeft* AND *RightArmStraight* AND *RightArmVerticalDown* AND *LegsClosed*
P17	(Mouth)	吉 束	 (Back)	 (Front)	*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightWristAboveRightShoulder* AND ∠((RWrist–RElbow), (RShoulder-RElbow))∈[15° 40°) AND *LegsClosed*
P18	(Eye)	貴 見	 (Back)	 (Front)	*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightWristAboveRightShoulder* AND ∠((RWrist–RElbow), (RShoulder-RElbow))∈[40° 60°] AND *LegsClosed*

P19	日 (Sun)	果輸	 (Back)	(Front)	(*LeftArmStraight* AND *LeftArmVerticalDown* AND *RightArmStraight* AND ∠((RWrist–RShoulder), (+Y))∈ [0° 30°] AND *LegsClosed*) OR (*TopOutofView* AND *LeftArmStraight* AND *LeftArmVerticalDown* AND ∠((RElbow–RShoulder), (+Y))∈[0° 30°] AND *LegsClosed*)

Notations:

1. joint.X(/.Y/.Z) represents the X/Y/Z coordinate of that joint
2. ∠(v1 v2) is calculated from the angle between vectors v1 and v2
3. LOL: length of leg
4. LOA: length of arm
5. +X/+Y/+Z denotes the positive direction of the X/Y/Z axis

Common rules:

1. *LeftArmStraight*: true if the joints LWrist LElbow LShoulder are on the same line
2. *RightArmStraight*: true if the joints RWrist RElbow RShoulder are on the same line
3. *LeftArmVerticalUp*: true if ∠((LWrist–LShoulder) (+Y))<=15°
4. *LeftArmVerticalDown*: true if ∠((LShoulder–LWrist) (+Y))<=15°
5. *RightArmVerticalUp*: true if ∠((RWrist–RShoulder) (+Y))<=15°
6. *RightArmVerticalDown*: true if ∠((RShoulder–RWrist) (+Y))<=15°
7. *LeftArmHorizontalLeft*: true if ∠((LShoulder–LWrist) (+X))<=15°
8. *RightArmHorizontalRight*: true if ∠((RWrist–RShoulder) (+X))<=15°
9. *LeftWristAboveLeftShoulder*: true if LWrist.Y>LShoulder.Y
10. *RightWristAboveRightShoulder*: true if RWrist.Y>RShoulder.Y
11. *RightWristBelowRightShoulder*: true if RWrist.Y<RShoulder.Y
12. *LegsOpen*: true if |LAnkle.X–RAnkle.X|>0.3*LOL
13. *LegsClosed*: true if |LAnkle.X–RAnkle.X|<=0.3*LOL
14. *TopOutofView*: true if the top of the human skeleton is out of Kinect's field of view

We have collected 120 trials for each of the 19 postures, the recognition accuracy of each posture is defined as the number of trials which have been correctly recognized divided by the total number of trials. The recognition accuracies for these 19 postures are shown in below. It is shown that for most of the postures, the recognition accuracies are very high (>95%), except for "Mouth" (P17) and "Eye" (P18). These 2 postures require the students to point to their mouths and eyes respectively, so the angles at the elbow in the 2 cases are quite similar, making them relatively hard to distinguish. On the other hand, there are variations for the same student while performing the same posture as well as variations across students, which will further affect the recognition accuracies.

The figure below shows a student who was trying to mimic the posture with our proposed method.