8. Human Pose Estimation

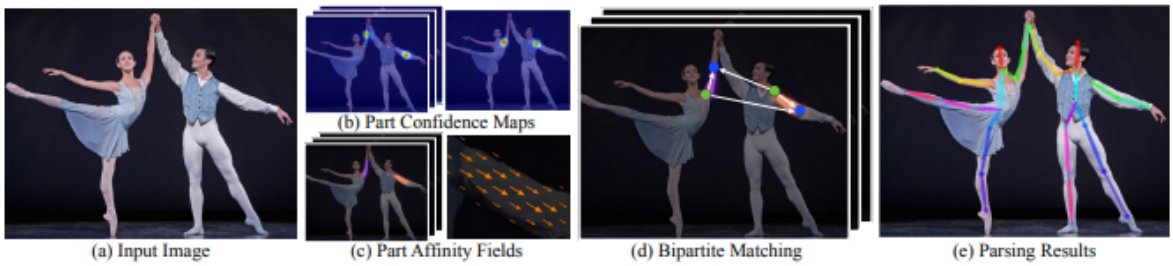
8. Human Posture Estimation

Source code path:
/home/pi/project_demo/07.AI_Visual_Recognition/detection/target_detection_USB.py

8.1. Overview

Human Posture Estimation estimates human posture by correctly linking the key points of the human body detected in the image. The key points of the human body usually correspond to joints with a certain degree of freedom on the human body, such as the neck, shoulder, elbow, wrist, waist, knee, ankle, etc., as shown in the figure below.

8.2, Principle



Input an image, extract features through the convolutional network, get a set of feature maps, and then split into two forks, using the CNN network to extract Part Confidence Maps and Part Affinity Fields respectively;
After obtaining these two pieces of information, we use Bipartite Matching in graph theory to find Part Association, connect the joints of the same person, and due to the vector nature of PAF itself, the generated bipartite matching is very correct, and finally merged into a person's overall skeleton;
Finally, multi-person parsing is obtained based on PAFs—>Convert the multi-person parsing problem into a graphs problem—>Hungarian Algorithm (Hungarian algorithm)
(The Hungarian algorithm is the most common algorithm for partial graph matching. The core of the algorithm is to find augmenting paths. It is an algorithm that uses augmenting paths to find the maximum matching of bipartite graphs.)

8.3. Startup

Note: The following commands require vnc login to the car.

```
cd /home/pi/project_demo/07.AI_Visual_Recognition/detection
```

```
python target_detection_USB.py
```

After clicking the image frame, use the [f] key on the keyboard to switch target detection.

```
if action == ord('f') or action == ord('F'):state = not state  # 功能切换
```

Input picture

Output picture