

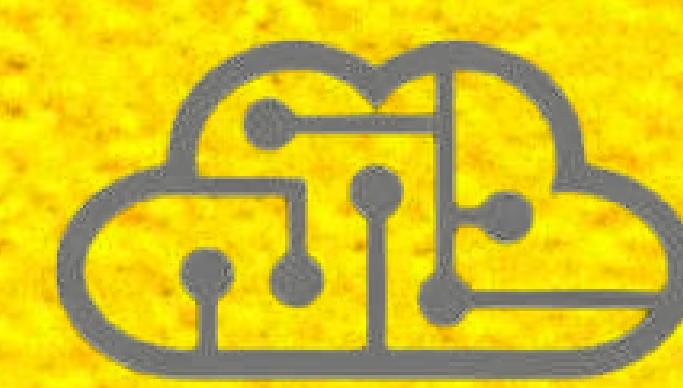
# HOW HUMAN POSE ESTIMATION WORKS?





## WHAT IS POSE ESTIMATION?


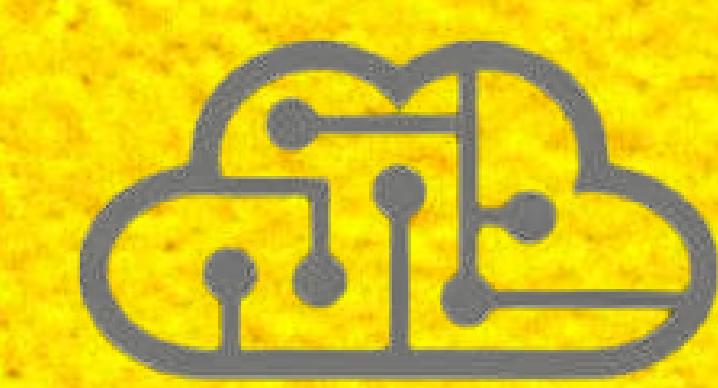
- Simply put, pose estimation is the localization of human joints in either images or videos.
- 2D Pose Estimation - Estimate a 2D pose ( $x,y$ ) coordinates for each joint from a RGB image.
- 3D Pose Estimation - Estimate a 3D pose ( $x,y,z$ ) coordinates a RGB image.



# HOW DOES IT WORK?



- Pose Estimation manipulates specific joints within the human body. These joints are known as “keypoints” within the pose estimation system.
- These models construct the keypoints and connecting levers through spatial arrangements between parts that allow for parameterization of the angles and joint position as vectors.
- The keypoints are typically labeled and connected at the end.

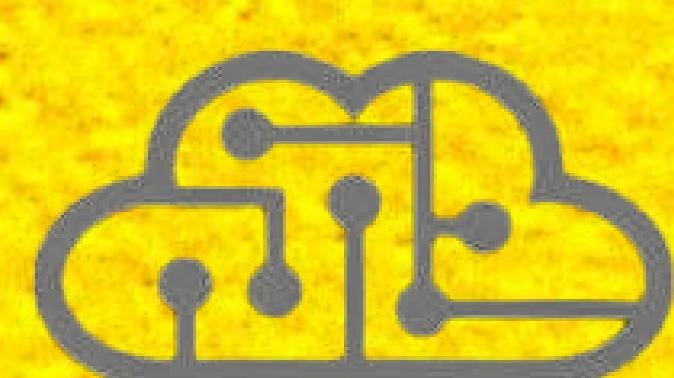


# PROJECT FLOW



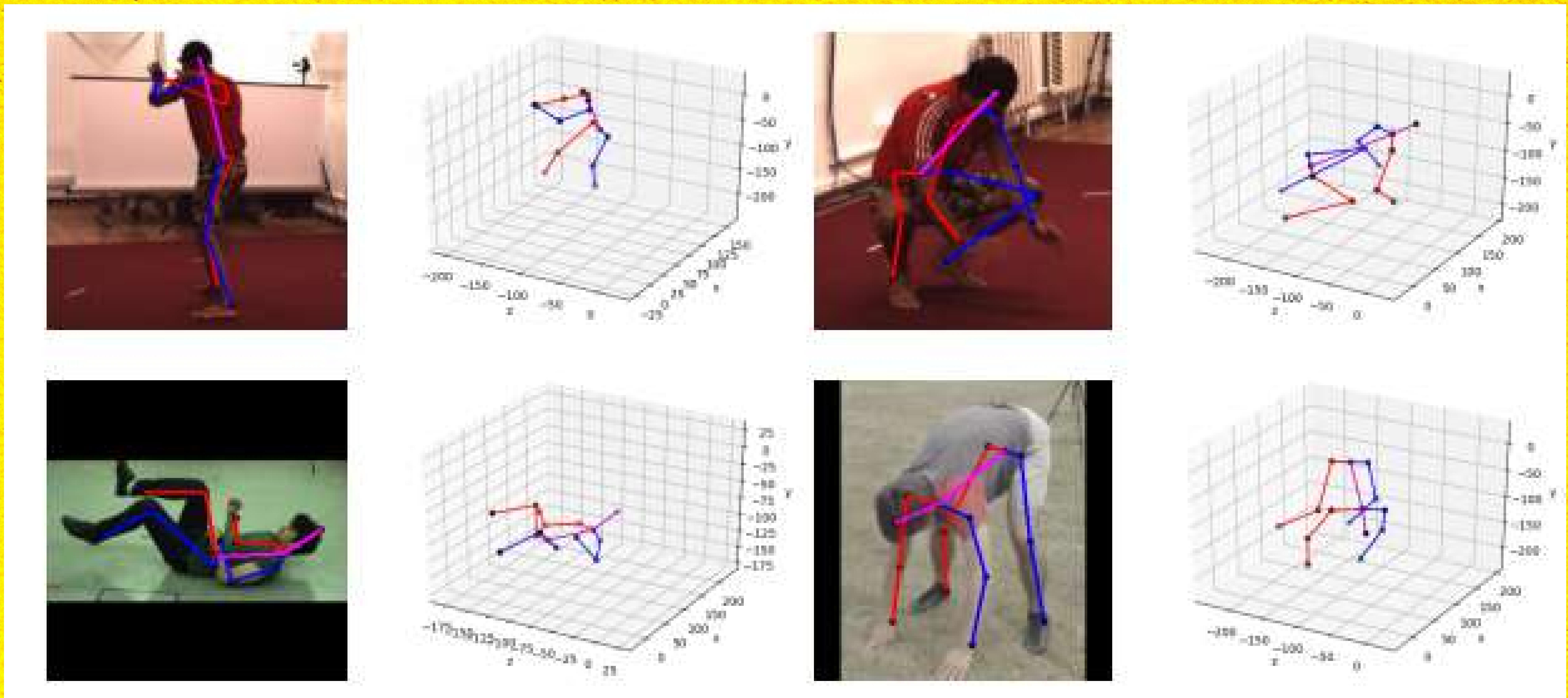
## 2D POSE ESTIMATION

- There are two major approaches of 2d pose estimation:
- Top-down: detect people first and execute a single-person pose estimation for all detections.
- Bottom-up: first detect body joints and then group them to get a person's pose.
- COCO and MPII datasets are mainly used for 2D benchmarks.



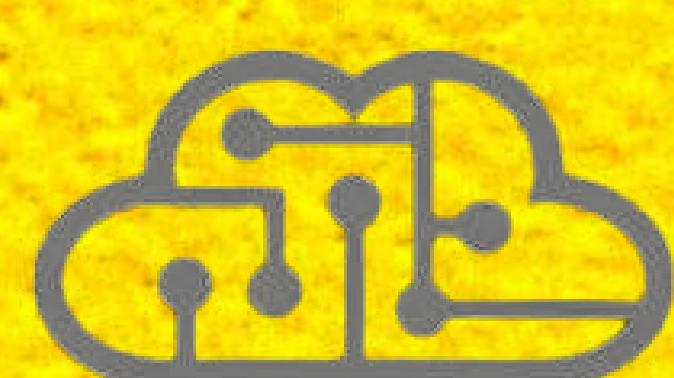
# DEEP LEARNING METHODS FOR 2D

- OpenPose
- DeepPose
- MultiPoseNet
- AlphaPose
- VIBE
- DeeperCut
- Mask RCNN
- DeepCut
- Convolutional Pose Machines
- PoseNet



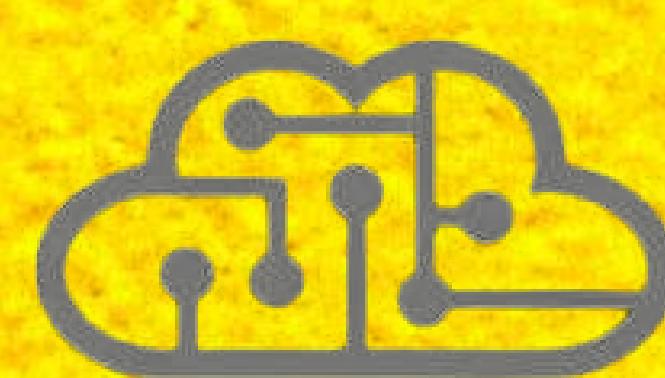
# 3D POSE ESTIMATION

- 3d pose estimation is the task of producing a 3D pose that matches the spatial position of the depicted person.
- It is a significantly more difficult problem than 2D Pose estimation. There are two approaches.
- First to estimate a 2D pose and then reconstruct a 3D pose. Or to regress a 3D pose directly.
- Multiple datasets like MOCAP systems, Human3.6, Panoptic, Campus, Shelf Dataset etc.



# DEEP LEARNING METHODS FOR 3D

- 3D Human Pose Estimation from Monocular Images with Deep Convolutional Neural Network
- 3D human pose estimation= 2D pose estimation + matching
- Towards 3D Human Pose Estimation in the Wild: a Weakly-supervised Approach
- A Simple Yet Effective Baseline for 3d Human Pose Estimation
- Integral Human Pose Regression
- Unsupervised Geometry-Aware Representation for 3D Human Pose Estimation



# APPLICATIONS OF POSE ESTIMATION

- Human activity and movement
- Augmented reality experiences
- Animation & Gaming
- Robotics
- Motion Capture
- Motion Tracking for Consoles
- Intelligent Driver Assist System
- MANY MORE....

# RESOURCES

CLICK THE LINKS TO GET RESOURCES

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- Find all resources here