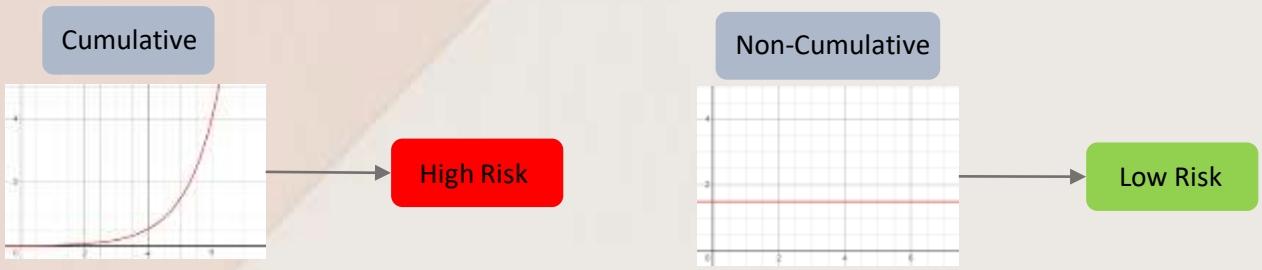
Vision-Based Ergonomic Cumulative Damage Assessment

Objectives

1. Understand the respective risk possibility of beginner and expert using cumulative damage risk assessment.
2. Understand the reliability of vision-based pose estimation compared to marker-based pose estimation.

Background

1. Non-cumulative risk assessment may classify a high-risk posture as low-risk posture by mistake.
2. Marker-based technique has more complex set up, but vision-based technique based only on image features



Marker-based

- Suit is required

Marker-less

- Suit is **not** required

Method

1. Repeat the Experiment of the Reference Paper
2. **VideoPose3D** 3D Pose Estimation
3. Cumulative Damage for **Low Back** and **Shoulder**
4. Risk Possibility

Expected Findings

1. Overall, more postures are classified as high-risk posture as the working time increases.
   For **low back**, the activities which need more bending of back are more likely classified as high-risk activities
   For **shoulder**, the activities which need higher raising of hand are more likely classified as high-risk activities
2. Pose estimation is not as accurate as the reference paper, but it is proved reliable enough

Data Needed

Data collected in the paper:

1. (Ryu et al. 2023) Ergonomic characteristics of expert masons
2. (Ryu et al. 2020) Relationships between body load and training, work methods, and work rate

***More Details：

Stress_and_Risk_Probability_Calculation.pptx