NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

Visual AI-enabled Ergonomic Risk Assessment for Worker Safety and Health at Industrial Workplaces

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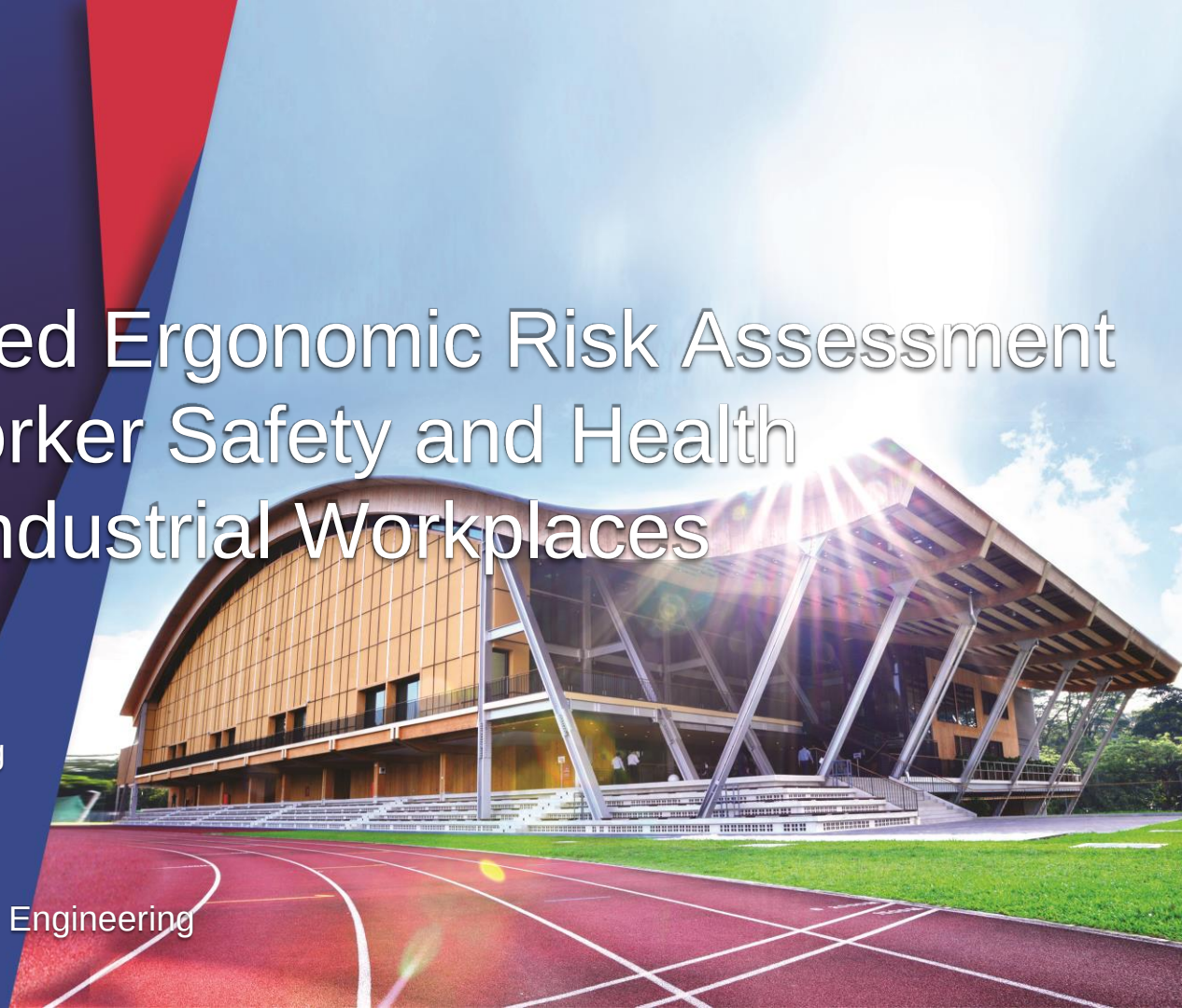
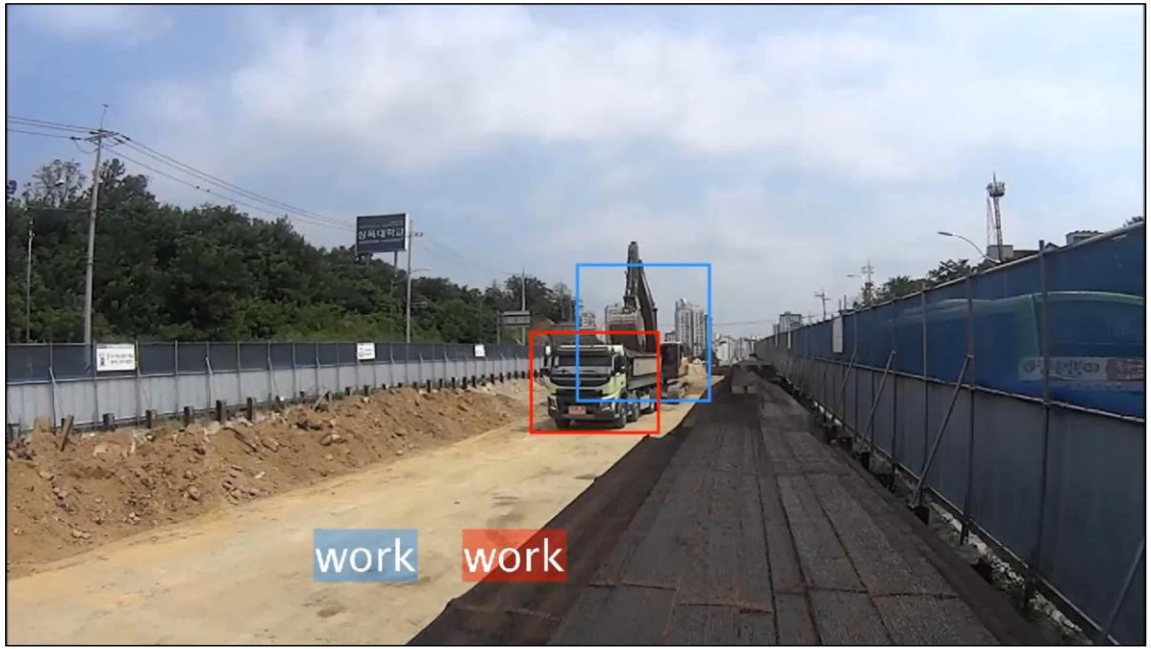


Our Previous Research:
Visual AI for Construction Digitalisation



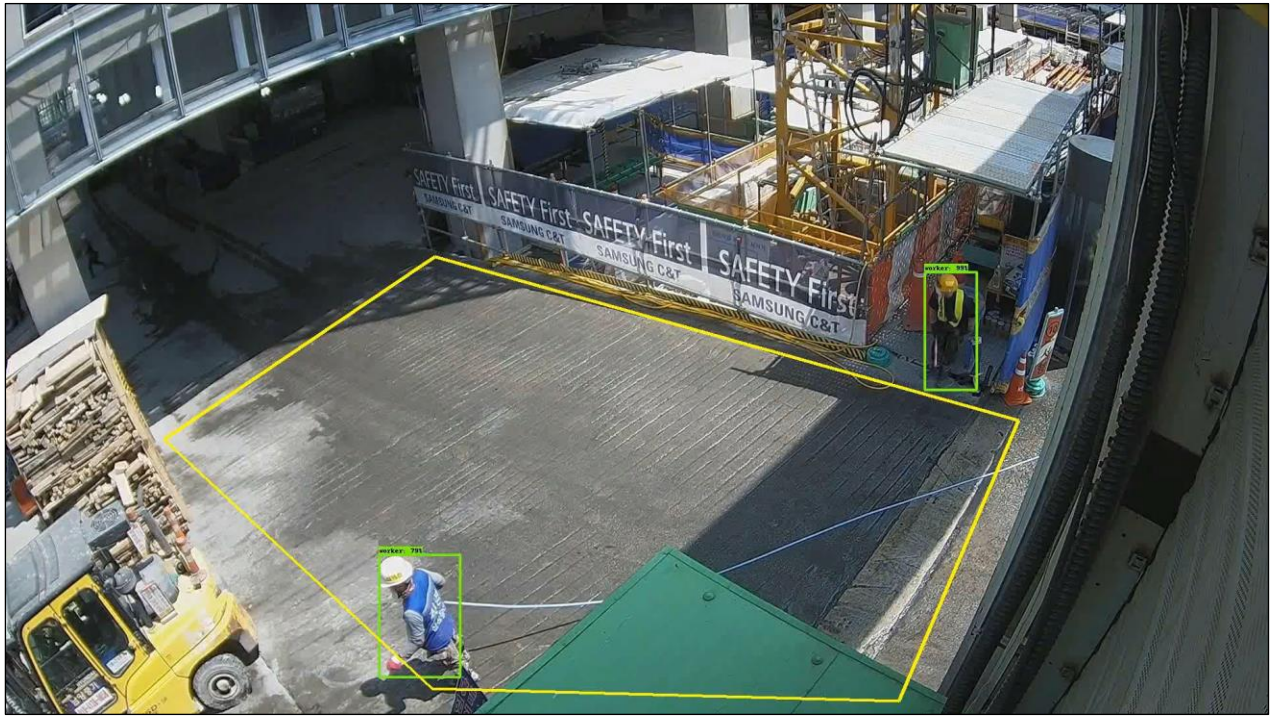
We can understand what are actually happening at industrial workplaces

Workers' Unsafe Behaviour Monitoring

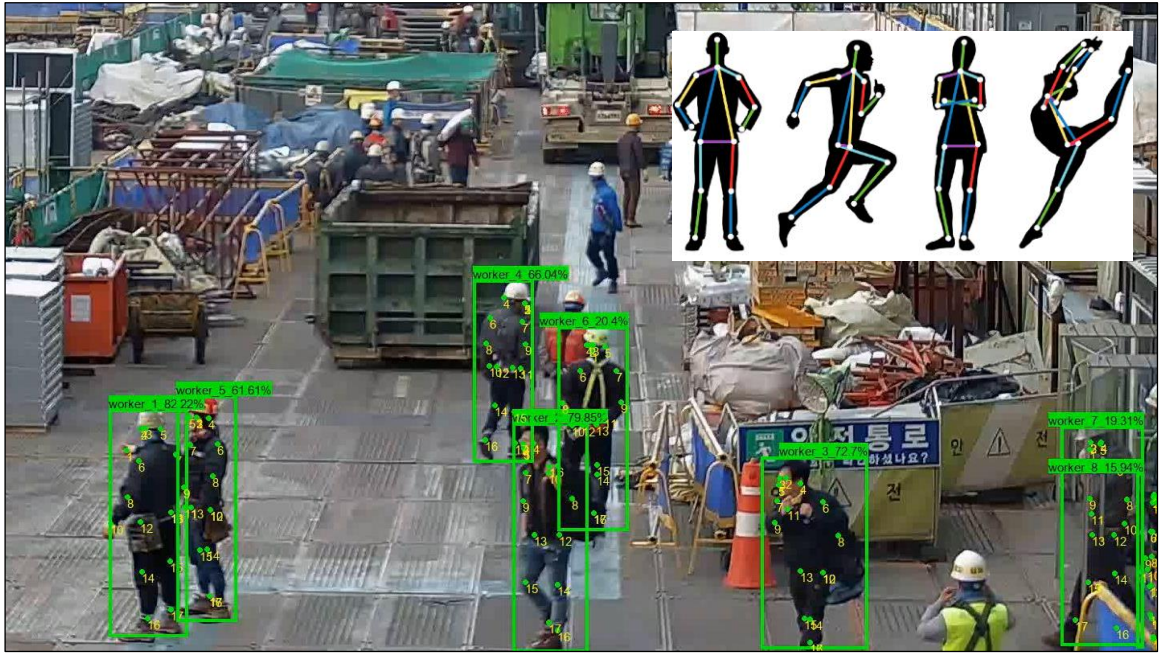
PPE-wearing Detection
(e.g., helmet, vest, etc.)

Unsafe Behaviour Monitoring

Access to Dangerous Zones Detection
(e.g., struck-by)



Pose Estimation & Ergonomic Assessment



Pose-informed Ergonomic Assessment
(e.g., REBA, RULA, OWAS, etc.)

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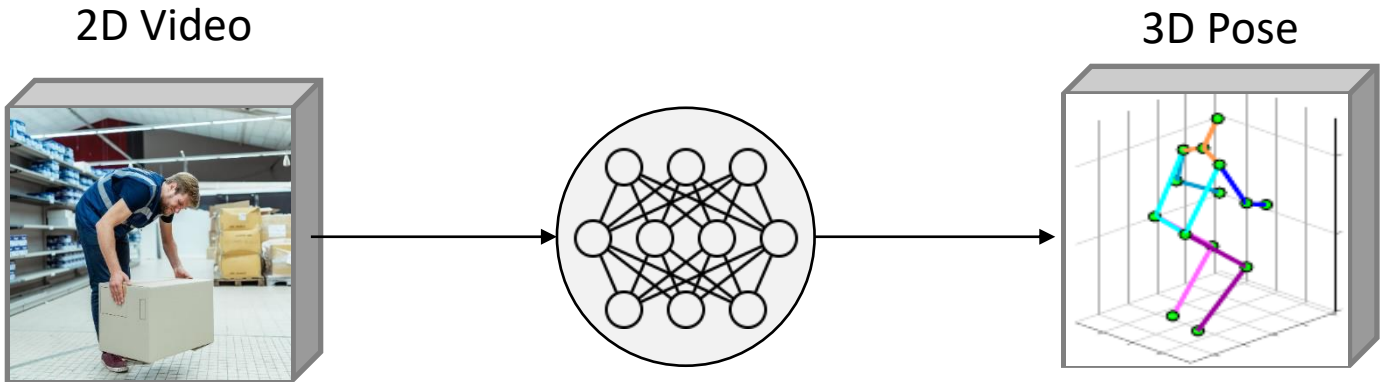
Objective 1:
To develop a visual AI that captures human poses from 2D digital images



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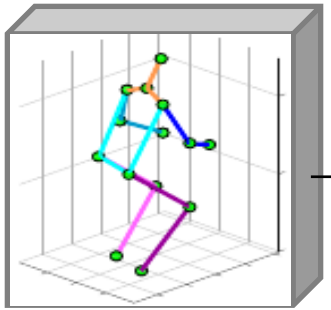
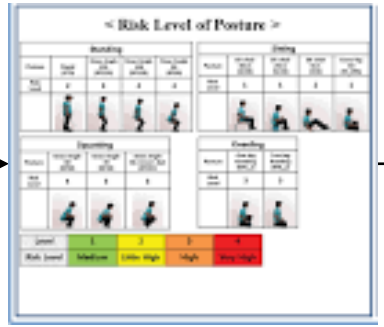
Objective 2:
To develop an algorithm that assesses ergonomic risks using the captured human poses

2D/3D Pose





Ergonomic Risks

(e.g., RULA, REBA, OWAS, etc.)

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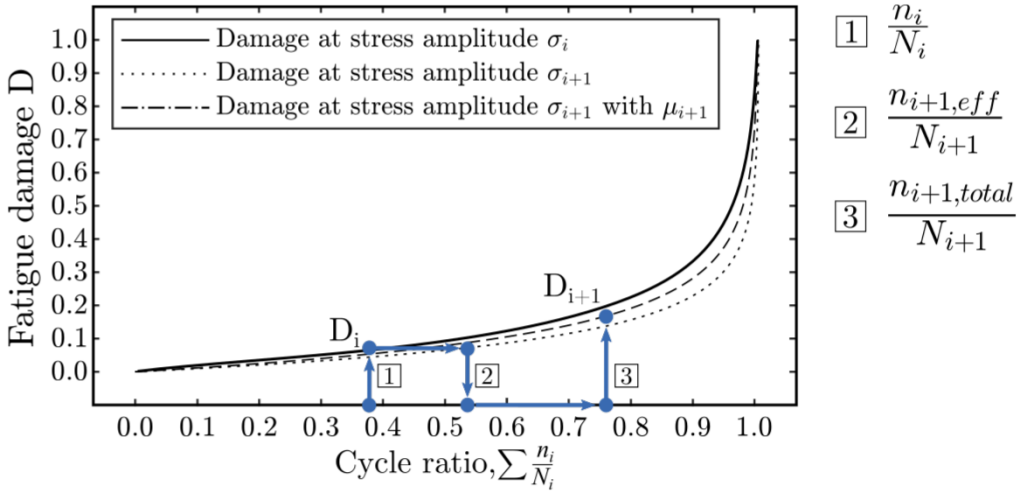
Objective 3: (if possible)

To apply a fatigue failure theory for a more accurate assessment



Discussion

- **3D human pose estimation algorithms**
  - Study state-of-the-art human pose estimation algorithms
  - Article 1, Article 2
  - Download GitHub and run it in your computer environment (if you want, you can develop from scratch)
  - If possible, we can further improve an algorithm (e.g., physical constraints)

Discussion

- **Theoretical background**
  - Ergonomic risk assessment tools: REBA, RULA, OWAS, etc.
  - Fatigue failure theory (in the context of ergonomic risk assessment)

- **Weekly or bi-weekly meeting**
  - Development or theoretical background?
  - In-person or online? (Let's have a lunch together soon☺)