



Use of Computer Vision to Improve Construction Safety

The Housing & Development Board (HDB) is Singapore's public housing authority. We plan and develop Singapore's housing estates; building homes and transforming towns to create a quality living environment for all. We provide various commercial, recreational, and social amenities in our towns for our residents' convenience.



"AISG has provided a great avenue for agencies to kick-start AI projects to provide solutions for automated inspection at construction sites. Their co-funding for the project through the 100E programme and the execution framework provided has been invaluable. AISG's assistance has been end-to-end and comprehensive, starting from the proper identification, engagement & evaluation of AI researchers, structuring the terms for the project as well as providing a good administrative structure."

Joseph Chan

Senior Engineer, Building Research Institute (BRI)

BACKGROUND

- Falling from height is one of Singapore's most common causes for fatal injuries at workplace and crane-related fatalities
- Two unsafe scenarios were identified to be detected from CCTV cameras:
 - Workers working near unbarricaded open edge of construction floor
 - Workers under lifted load

BUSINESS CHALLENGE

How can AI help provide automated and reliable round-the-clock supervision on construction sites and a faster alerting mechanism for identification of unsafe situations?

AI SOLUTION DEPLOYED

Computer vision was used to help monitor the sites. Cutting edge deep-learning technology was developed to identify (i) construction workers (ii) lifted pre-casted loads (iii) the 3-dimensional position of area under a lifted load from a 2-dimensional image, and (iv) unbarricaded open edges on construction sites. Automated alerts would then be sent to site supervisors when the two unsafe scenarios were detected. In particular, unique algorithms were designed for the latter 2 use cases.

OUTCOMES



An MVP to detect two construction unsafe scenarios was deployed and trialed at 4 construction sites



Computer vision was applied onto existing CCTV system, reducing the reliance on manual safety supervision thus allowing more consistency and accuracy



Safety culture improved as workers are more mindful that there is a smart camera surveillance system