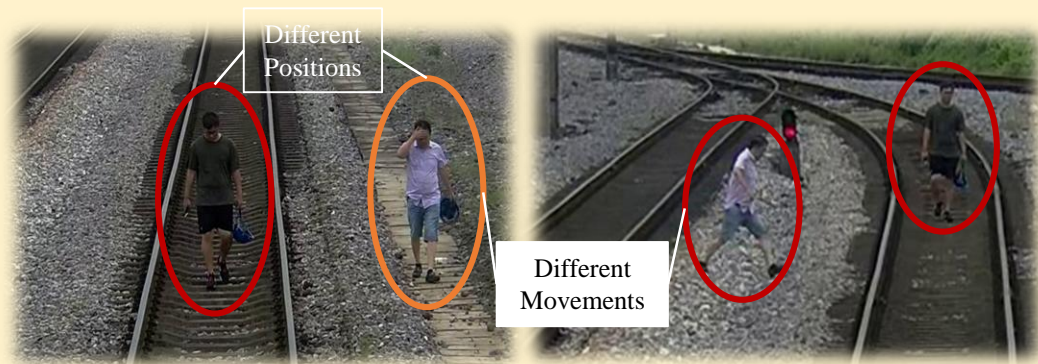


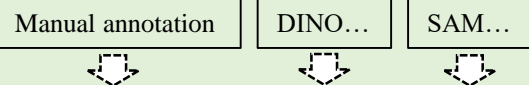
Task Definition

Threat levels

- **Severe Threat:** Objects located on the track or about to enter the track.
- **Potential Threat:** Objects on the ballast or about to enter the ballast area.
- **No Threat:** Objects outside the track and ballast zones.



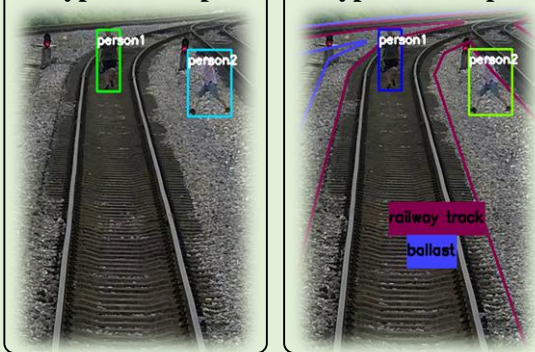
Visual Prompt



Visual Prompt Generation

Type-I Prompt

Type-II Prompt



Text Prompt

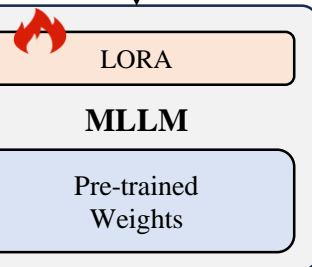
System prompt

Task definition

User Query

Question: What is the threat level of the object?

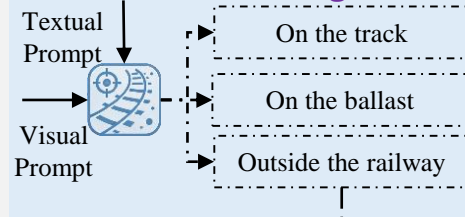
SFT



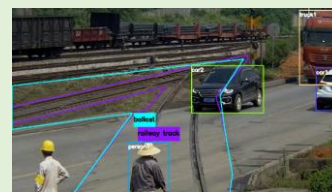
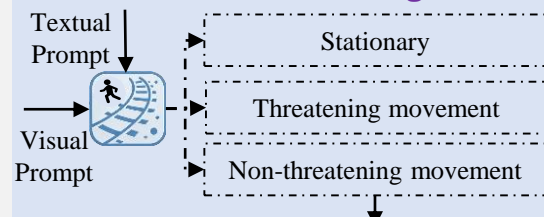
SFT

Joint Fine-Tuning

Position-aware Agent



Movement-aware Agent



- Car 1: No threat
- Car 2: Severe threat
- Person 1: Severe threat
- Truck 1: Potential threat

Prediction Results