Optimization for a moving camera position at intersections

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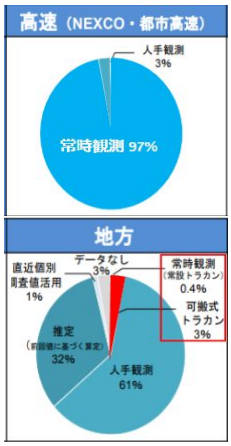
1. Introduction

- **Current status of traffic surveys automation**
  - **97%** of them in highways are automated
  - **3%** of them in general roads are done manually
  - Counting precision are low in **intersections**



Ref:[1]

- **Causes of inaccuracy in automation using cam**
  - Occlusions with cars
  - Measurement at night
  - **Effects of sunlight, headlights, etc.**

■日照等の影響

太陽光のフレアによる影響

ヘッドライトのフレアによる影響

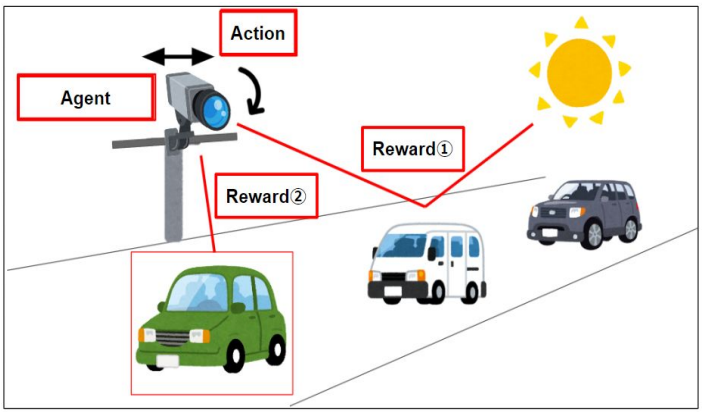
Ref:[2]

2. Purpose

Realizing an automatic traffic volume measurement system that is robust to the effects of sunlight over time, such as backlighting and shadows.

3. Method

The images acquired from a movable camera installed at an intersection are automatically measured by object recognition and tracking.
Reinforcement learning is planned to use to optimize the motion of the moving camera.



- **Elements of Reinforcement learning**

Agent: A moving camera

Action: Left/right movement, up/down tilt

Reward①: Backlight intensity (histogram)

Reward②: Level of confidence of detector

4. Experiment

- Compare precision in this two situations
  - Camera location decided by the method
  - Camera location decided by human

References

[1] MLIT, Issues of data collection for traffic census, https://www.mlit.go.jp/road/ir/ir-council/ict/pdf01/03.pdf
[2] MLIT, Analysis of camera images for constant observation, https://www.mlit.go.jp/road/ir/ir-council/ict/pdf04/04.pdf