



# Rethinking Illumination for Person Re-Identification: A Unified View

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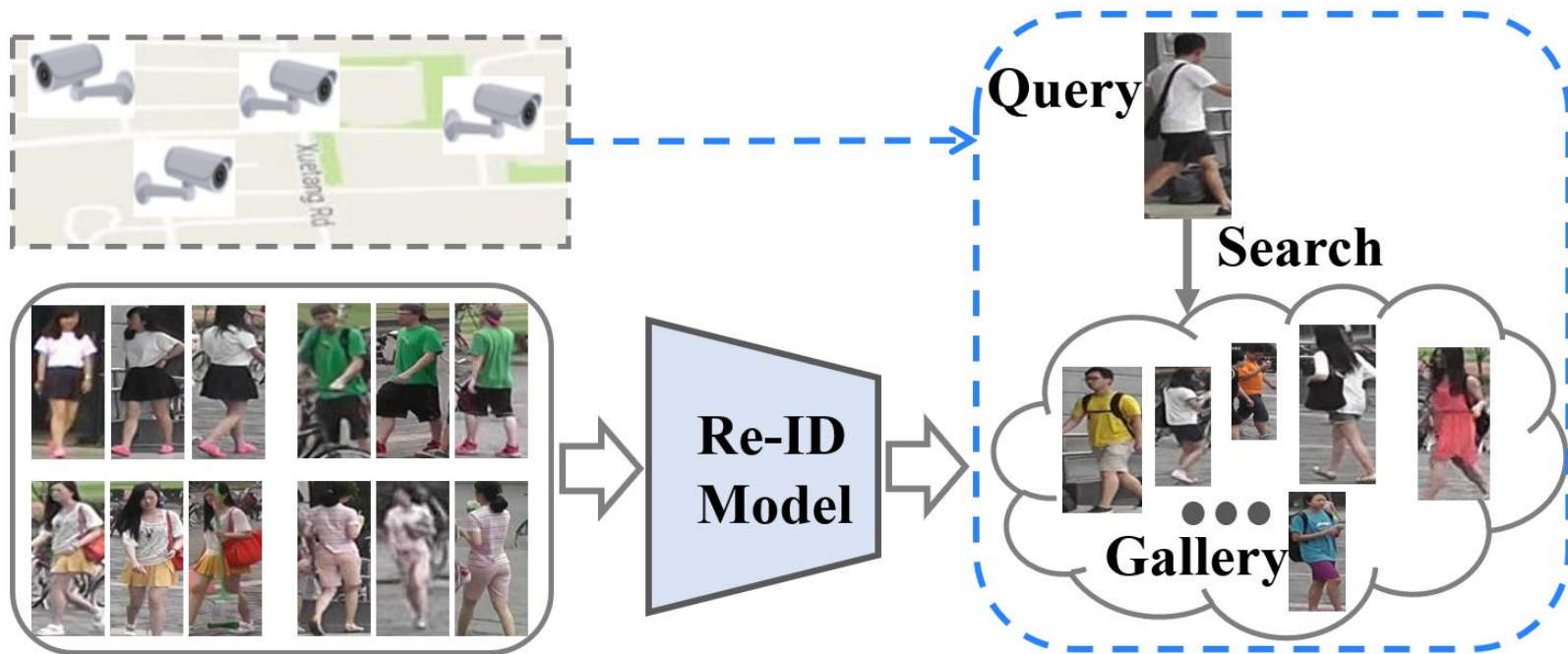


IEEE  
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SOCIETY



# Introduction: Person Re-ID

- Retrieve a specific person in a large gallery





Dataset engine

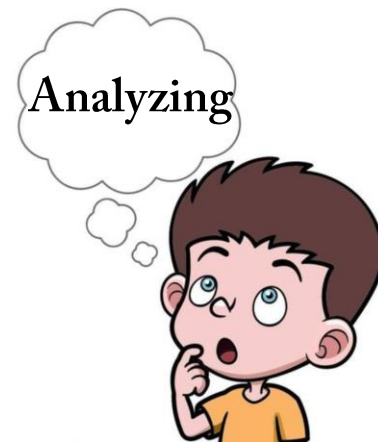


Person identities



Weather/Illumination

# How visual factors affect re-ID system ?





# Our SynPerson dataset

**A Identities**



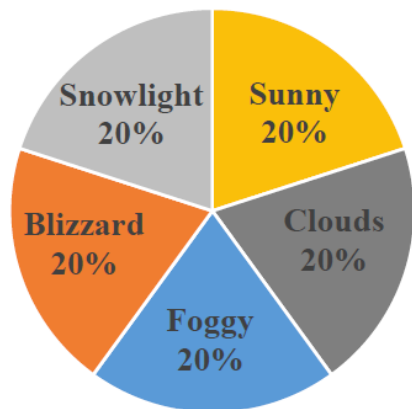
**B Weathers**



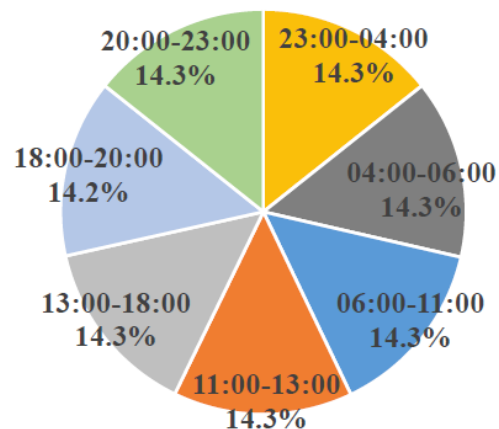
**C Illuminations**



# Our SynPerson dataset

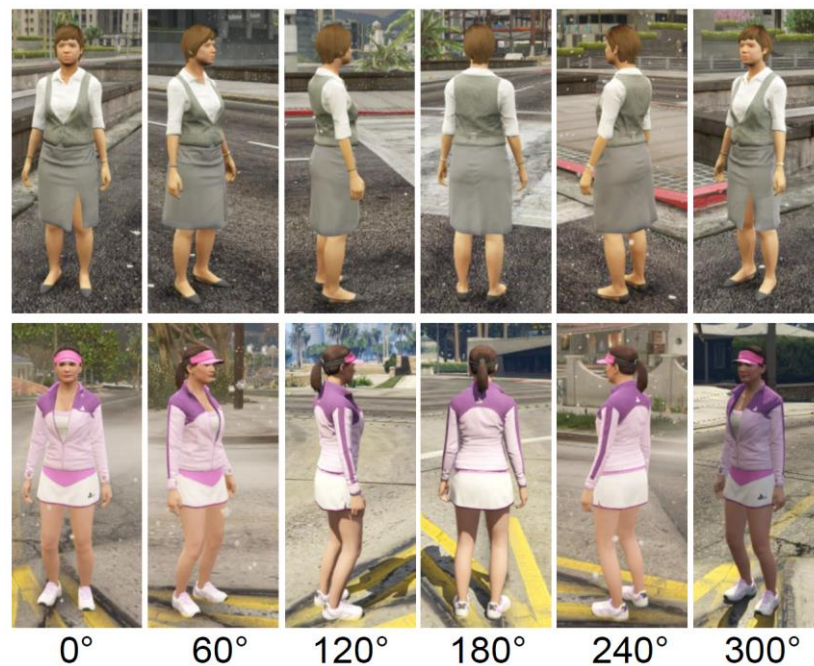


(1) weather



(2) illumination

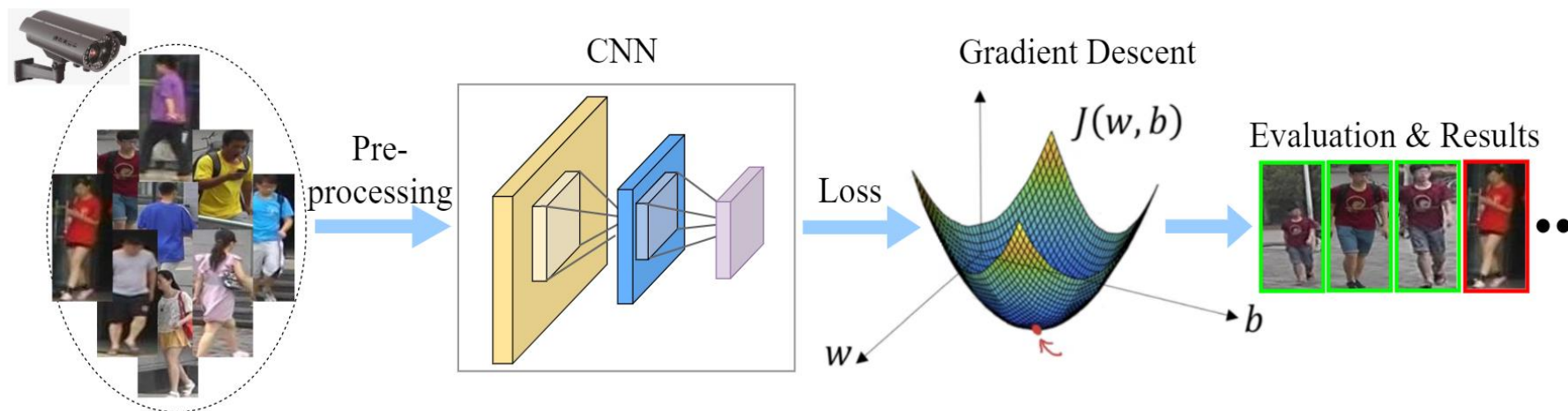
## Viewpoint



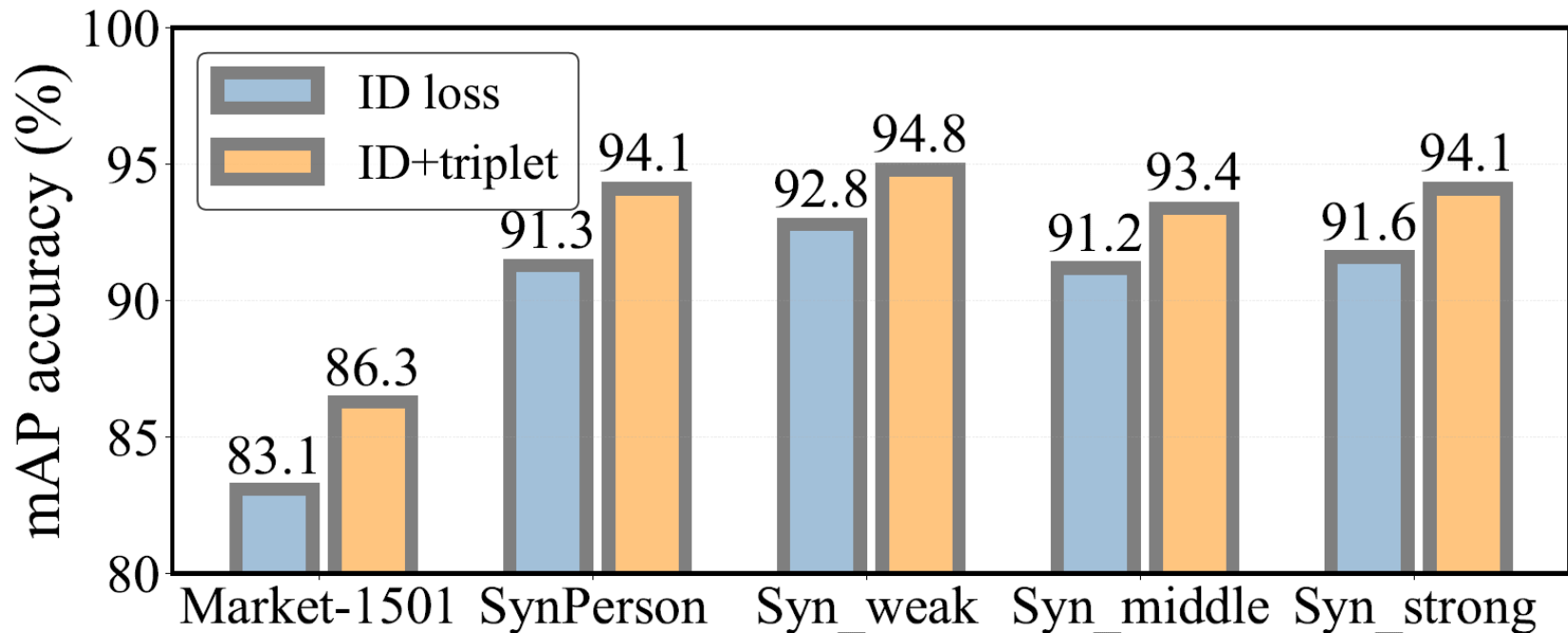
## Background



# Backbone



## Results



Performance of re-ID system on real-world datasets and SynPerson dataset with different loss functions

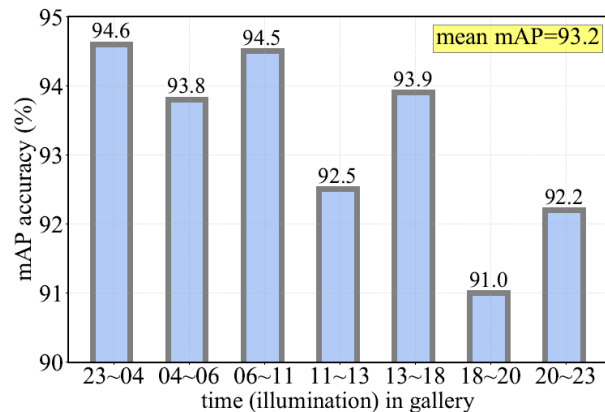
## Results

Experiment	Bboxes	Components			SynPerson		
		W	M	S	mAP	rank-1	rank-5
Group 1	43,930	✓			63.2	93.2	98.6
Group 2	43,930		✓		78.0	96.1	99.3
Group 3	43,930			✓	60.9	95.0	98.9
Group 4	43,930	✓	✓		90.3	97.4	99.5
Group 5	43,930	✓	✓	✓	93.8	98.5	99.8

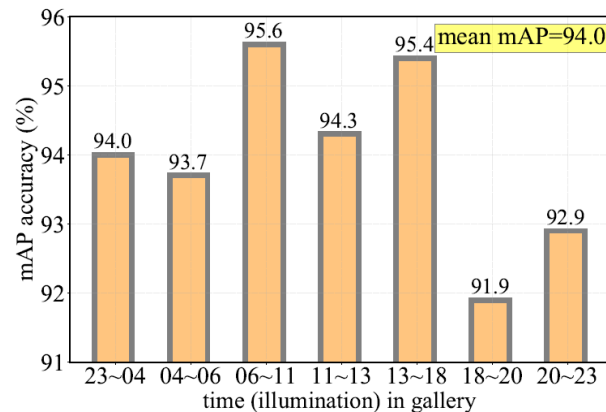
How Do Illumination Distributions in the Training Set Affect Model Learning?



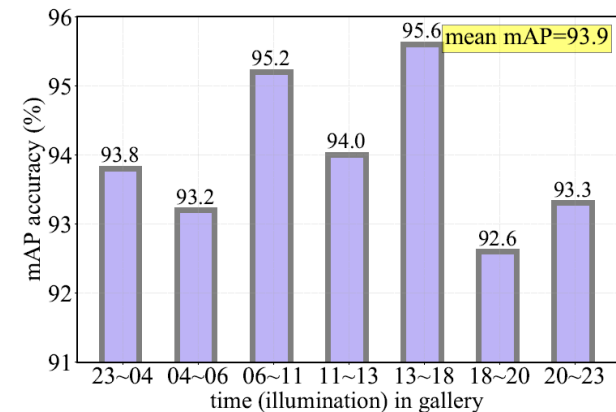
# Results



(a) Weak light in query set



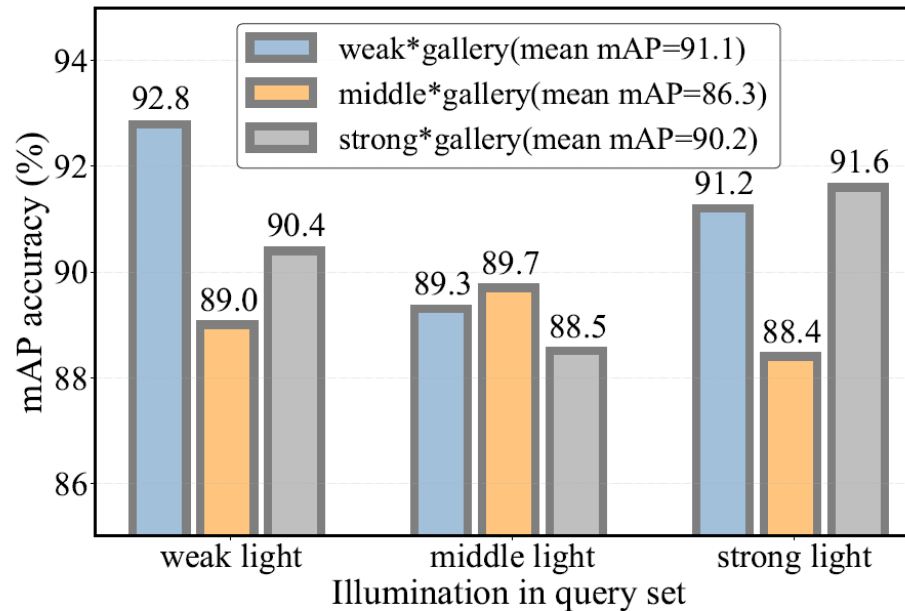
(b) Middle light in query set



(c) Strong light in query set

How Does Query Illumination Affect Retrieval?

## Results



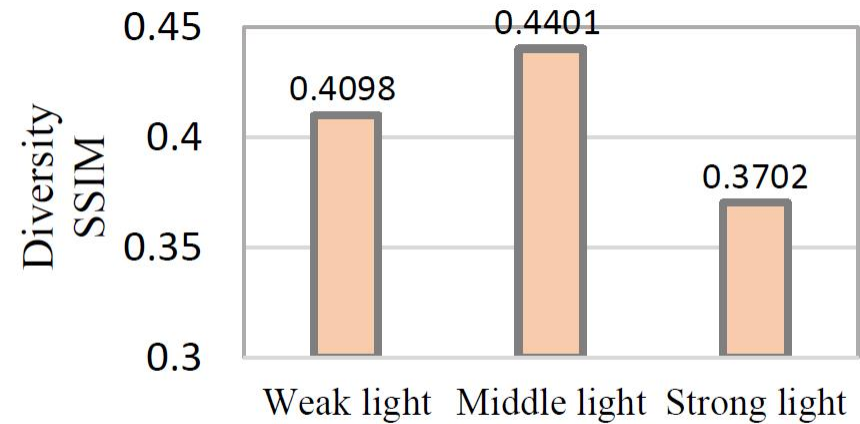
### (d) Impact of light disparity

How Do True Match Illuminations in the Gallery Affect Retrieval ?

## Discussion



(a)



(b)

- ✓ There exists a large illumination variation among subset of Middle Light due to its discontinuous time period
- ✓ The discriminability of re-ID model will be negatively affected in a scenario with a larger illumination variation

## Future Work

- ✓ How to eliminate the negative impacts of large illumination of train-set on the discriminability of Re-ID model.
- ✓ Further exploring the influences of these visual factors on other human-related tasks, such as pose estimation and human part segmentation.



*Thank you!*



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