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May 4th, 10:00 AM - 11:30 AM

Collecting Image Cropping Dataset: A Hybrid System of Machine and Human Intelligence

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Collecting Image Cropping Dataset: A Hybrid System of Machine and Human Intelligence

1



$w:h = 1:1$



$w:h = 1:1$



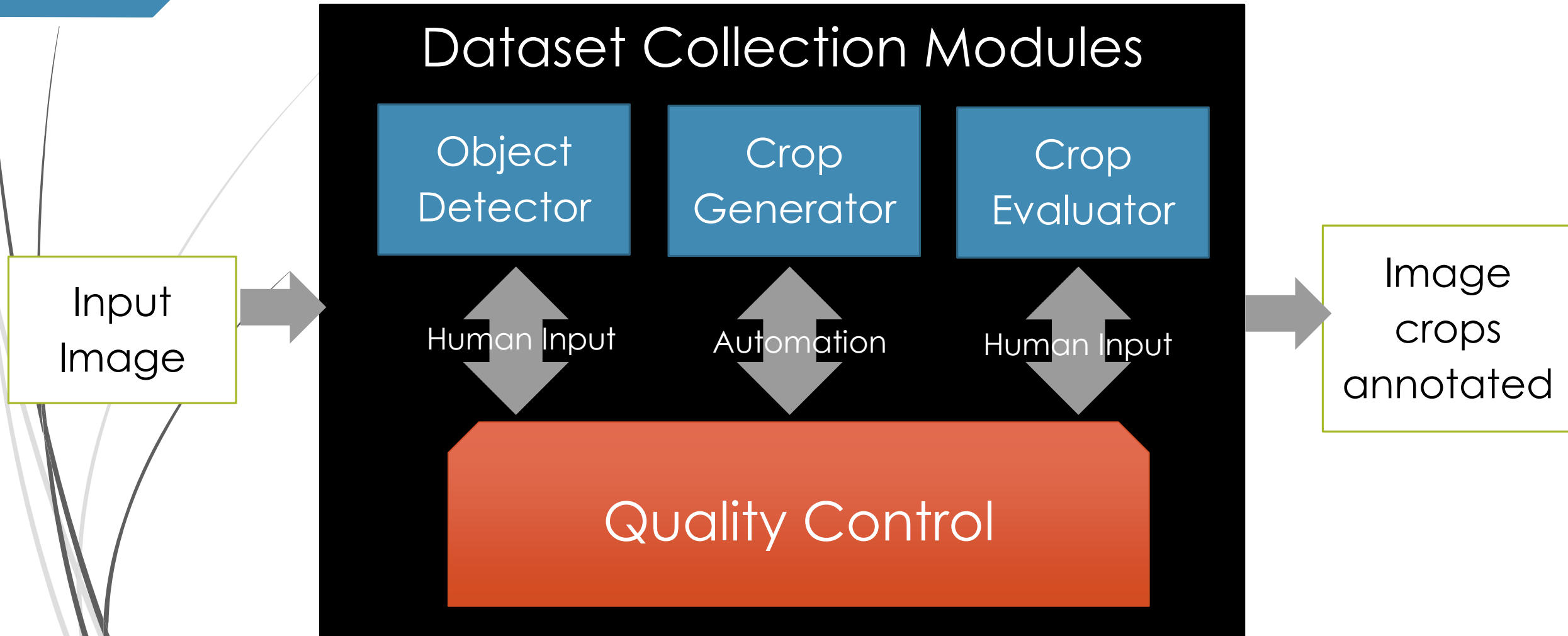
$w:h = 1:1$



$w:h = 1:1$

Project goals

- Collect a dataset of up to 50,000 images
 - at least one good crop for each aspect ratio
1:1, 4:3, 16:9
- Employ crowdsourcing for annotation
- Hybrid system of human & machine intelligence
- Online-game interface



Object Detector

5

Input Images

Front End: online-game interface

Back End: data-mining system

Main Objects in images

Game Scoring

Image Selector

Performance evaluator

Database

Computation Methods

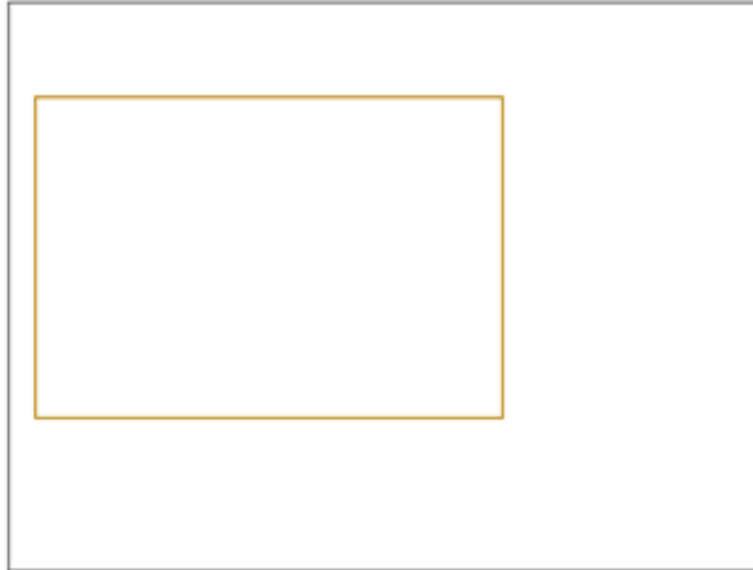
Game interface

Your Score: 0

2



Your Score: 0



Your Score: 782

3



The starting set of labeled images

- ▶ Have 5 persons labeled objects for 100 images
 - ▶ Use Kmeans clustering to group and center the object marked
- ▶ Labeled images are used for quality control and scoring

Image ID: 28

Go

Next

8

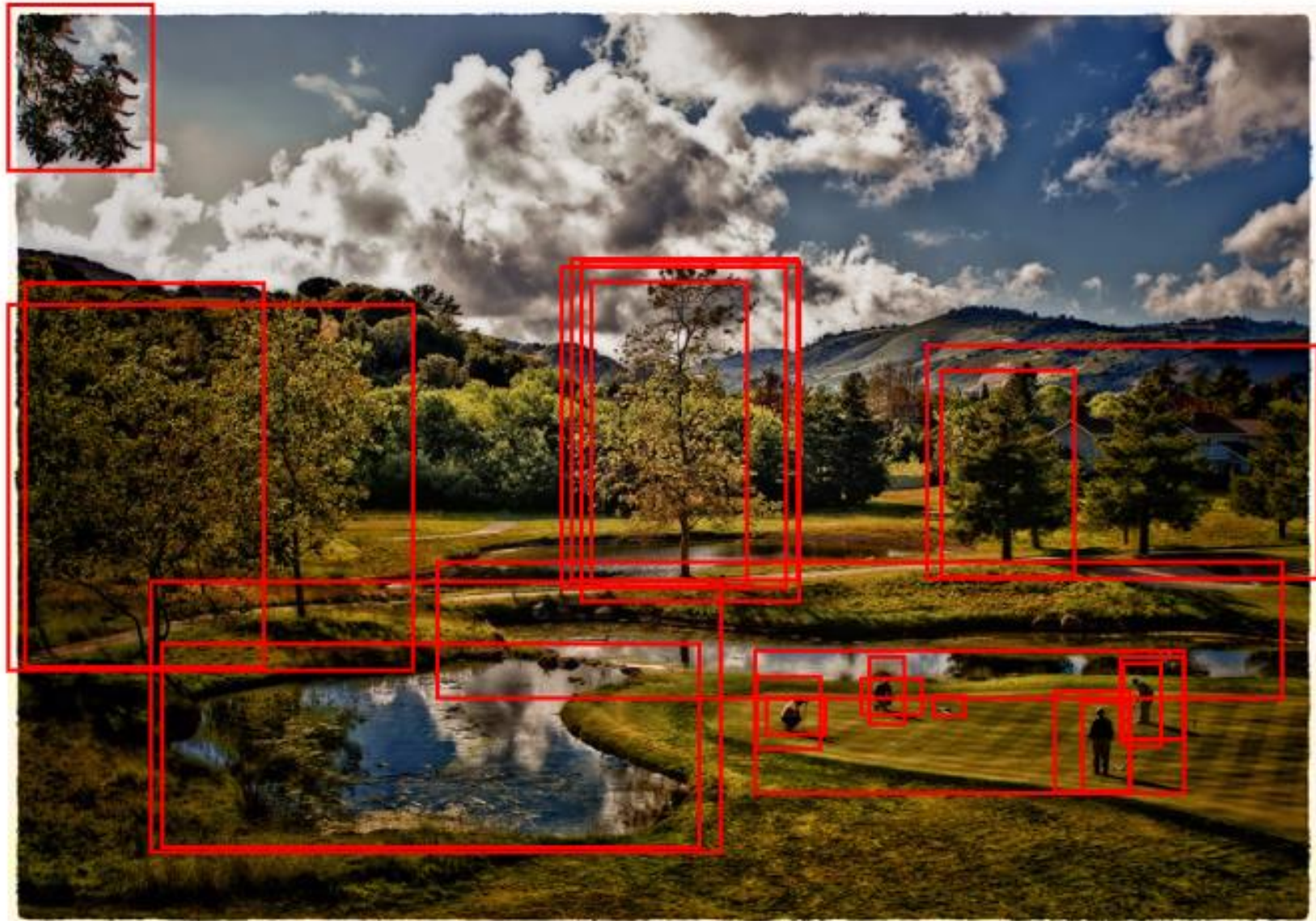


Image ID: 28

Go

Next



Your Score: 3840

6

10



Your Score: 0

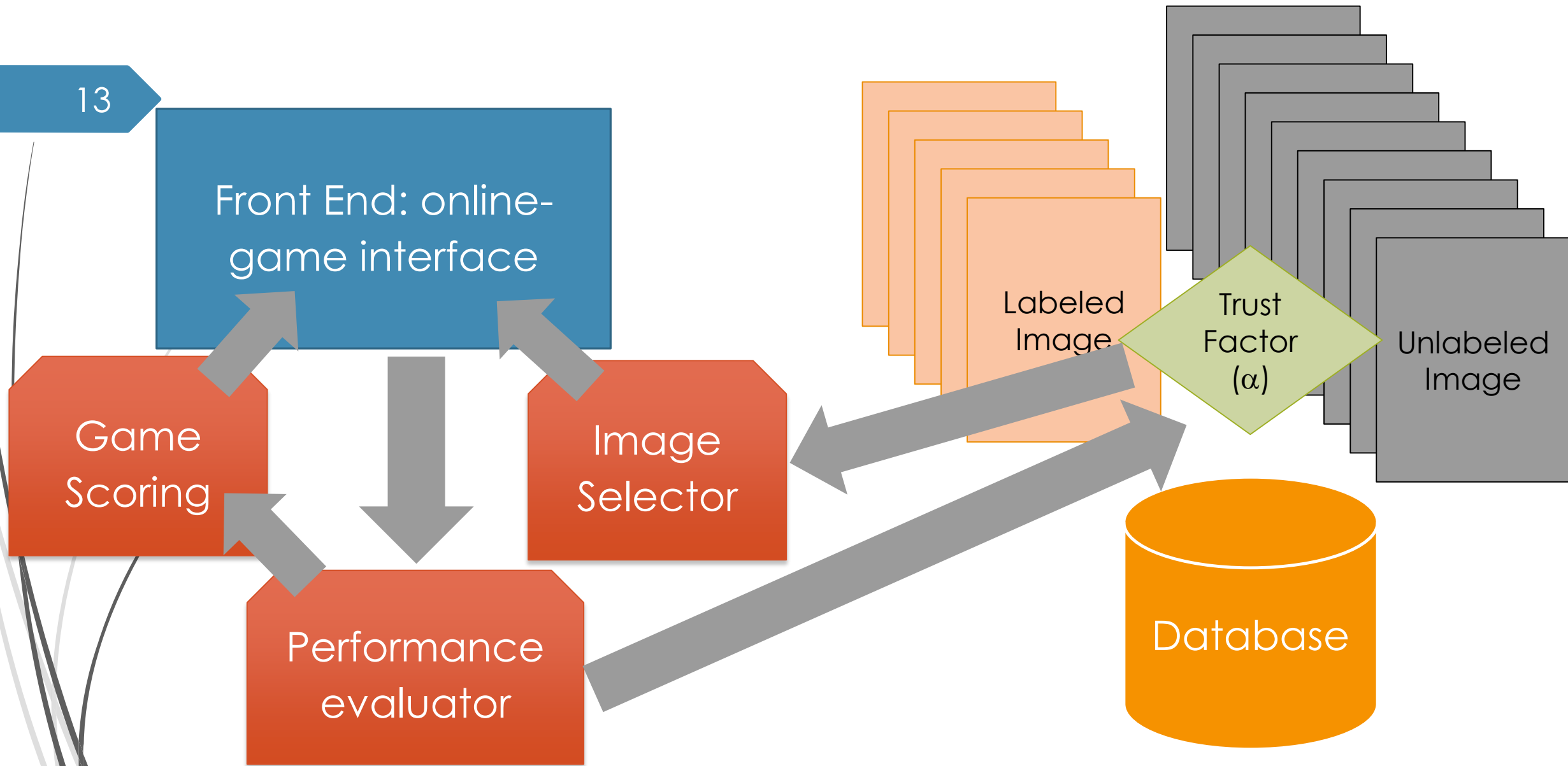
6



Quality control

- After each game turn, evaluate and record player's performance
- Players that performed well have a higher probability to be given an unlabeled image in the next turn
- BOTH labeled and unlabeled images are updated with new objects

13



Trust Factor = the probability that an unlabeled image is shown

14

Front End: online-game interface

Game Scoring

Image Selector

Random Scoring Module

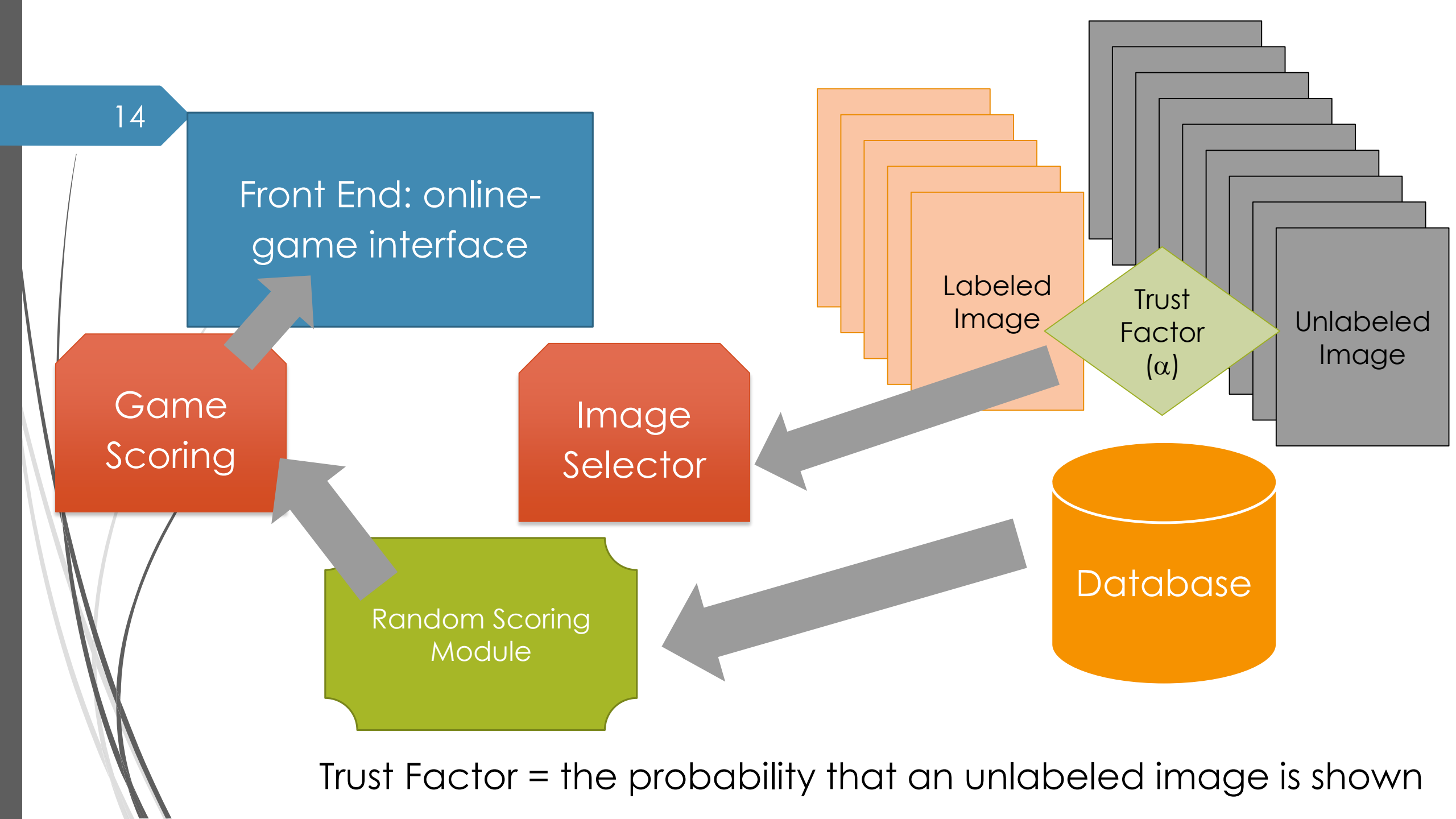
Labeled Image

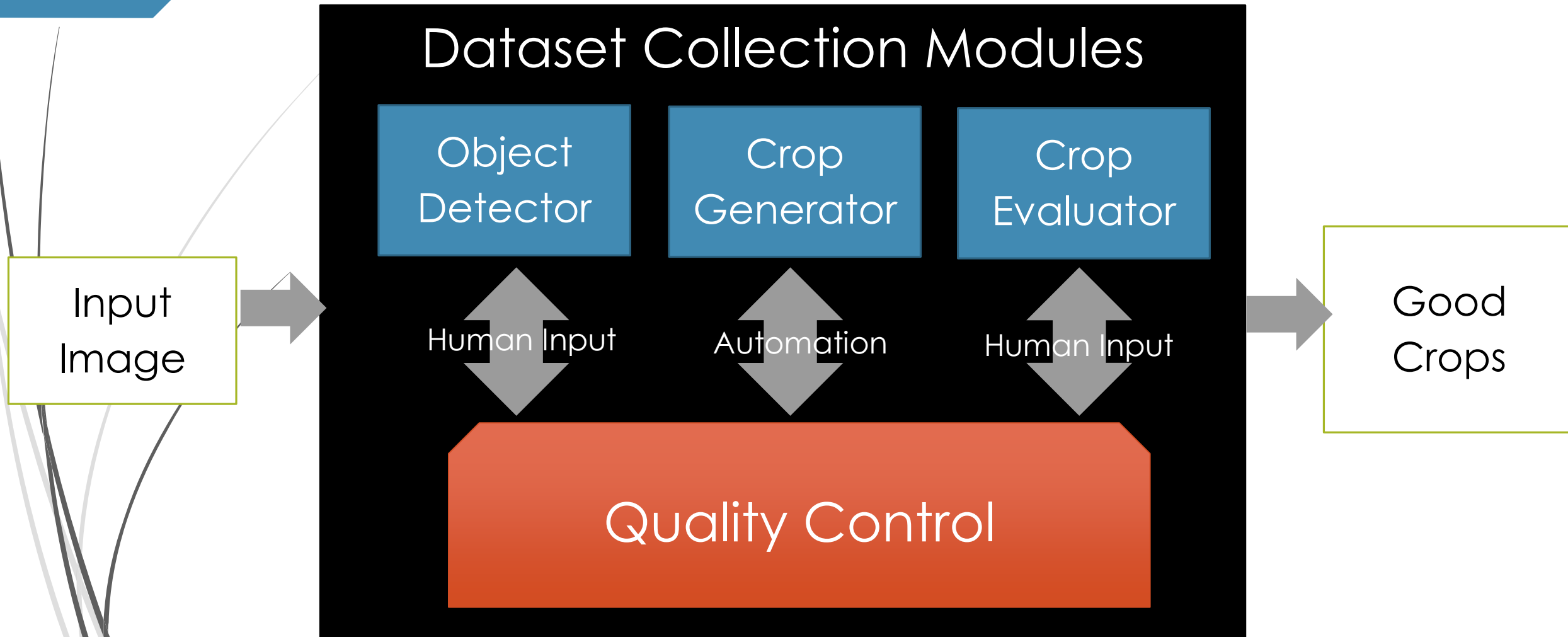
Trust Factor (α)

Unlabeled Image

Database

Trust Factor = the probability that an unlabeled image is shown





Generating potential good crops

- Composition Principles
 - Rule of third
 - Rule of balance
 - Rule of simplicity
- Computation Modules
 - Sliding windows
 - Saliency analysis



Target Ratio
 $w : h = 1 : 1$

Crop Generator

Composition
Principles

Computational
Modules



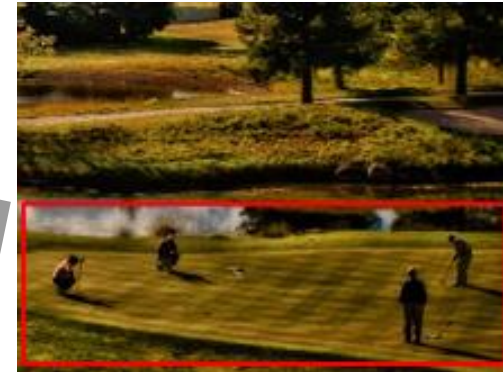


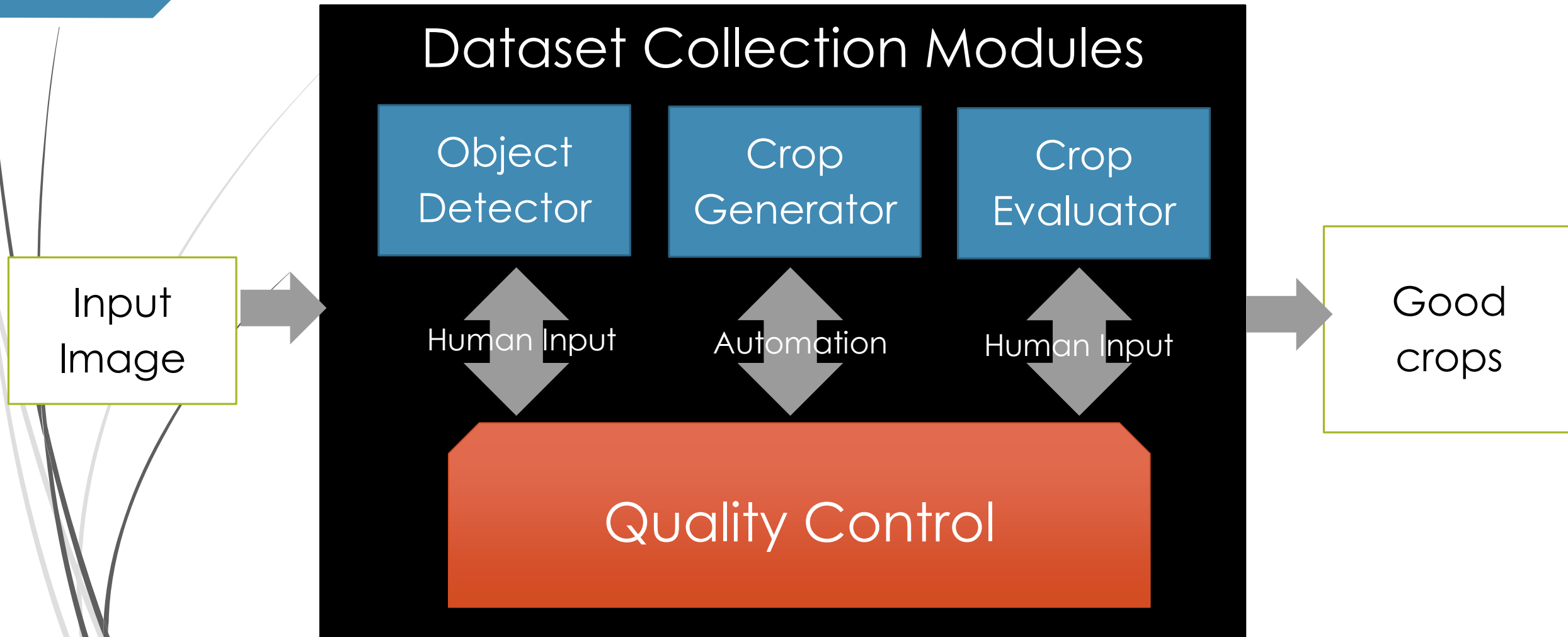
Target Ratio
 $w : h = 4 : 3$

Crop Generator

Composition
Principles

Computational
Modules





Evaluation of the generated crops

- A person is asked to select the best crop among 4
- Quality control
 - 2 random crops & 2 potential good crops
 - Timing
 - Scoring