



# RLST

## A REINFORCEMENT LEARNING APPROACH TO SCENE TEXT DETECTION REFINEMENT

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# WHAT'S INCLUDED

INTRODUCTION

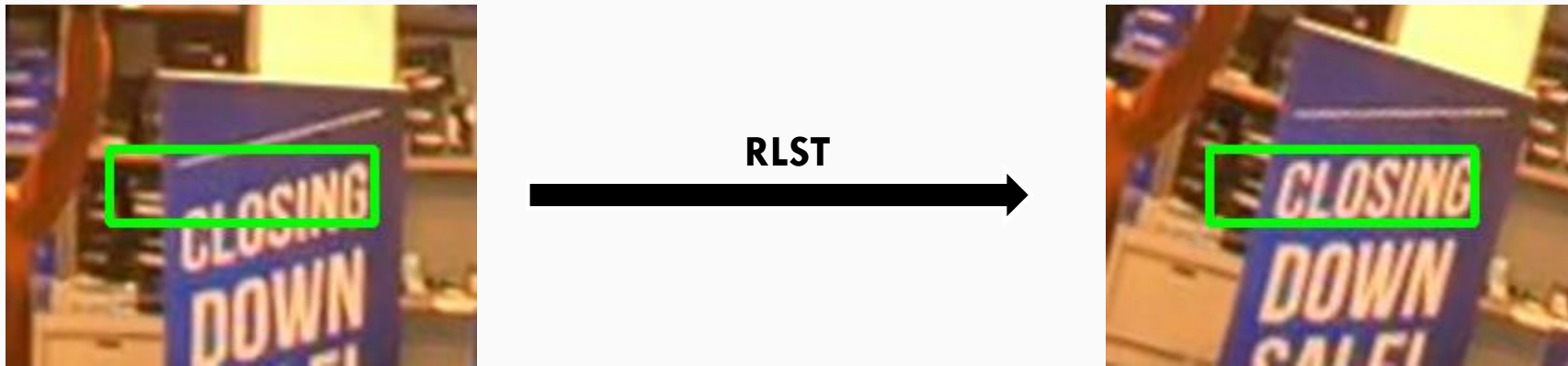
OVERVIEW OF RLST

CONTEXT GLANCE MODULE

REINFORCEMENT LEARNING MODULE

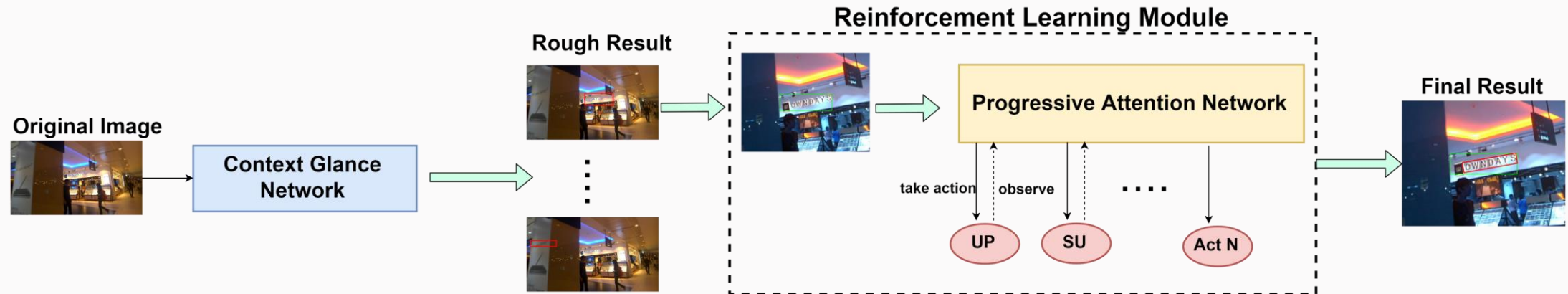
Q & A

# INTRODUCTION



General Idea: Let's refine the rough detected text boxes

# OVERVIEW OF RLST



Some short for...

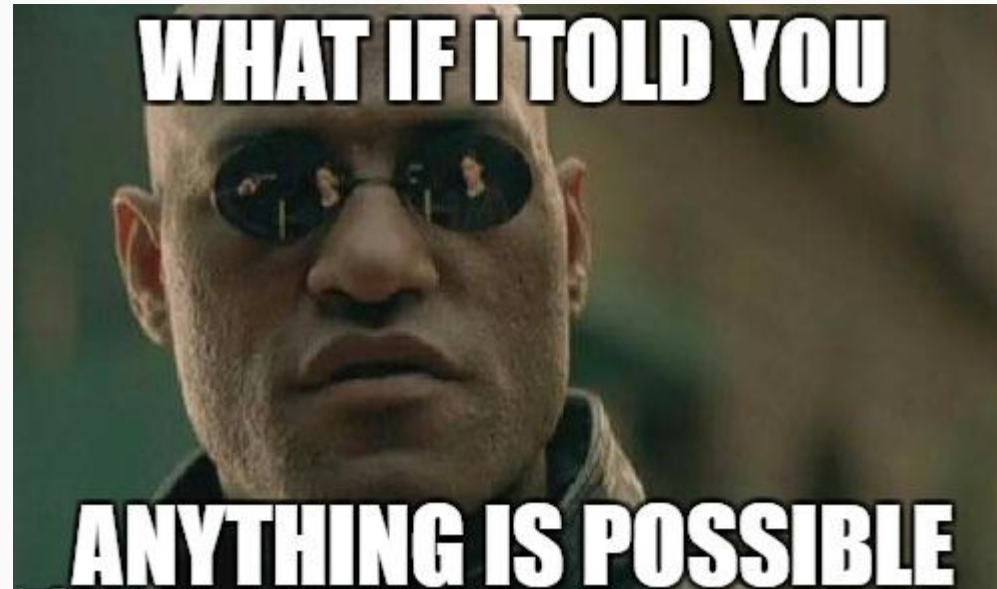
Context Glance Module: CGM

Context Glance Network: CGN

Reinforcement Learning Module: RLM

Progressive Attention Network: PAN

# CONTEXT GLANCE MODULE



# REINFORCEMENT LEARNING MODULE.0

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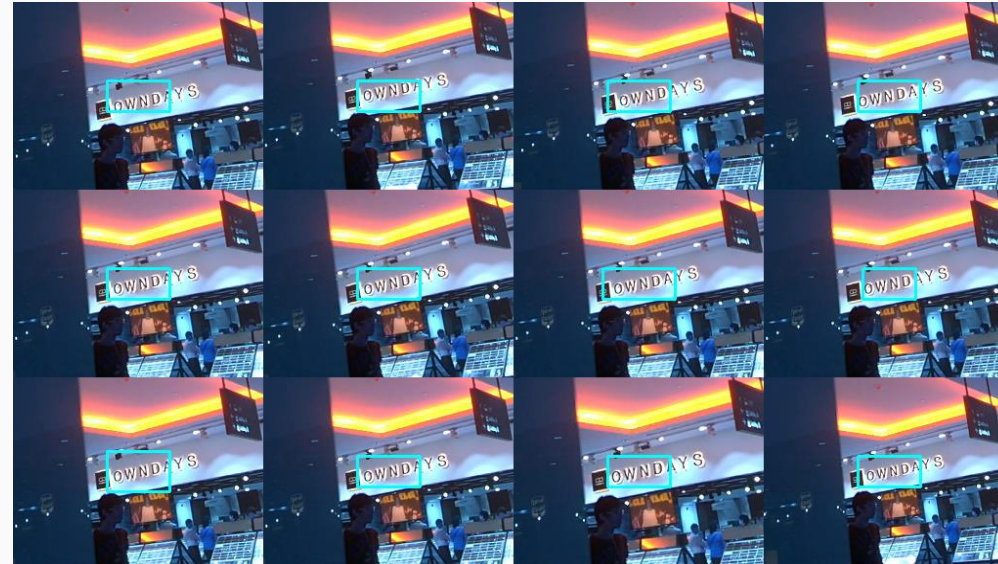
**Algorithm 1:** RLST DQN training

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**Initialize:** Fixed-size Contexts of target image based on distorted ground truth;  
**Initialize:** Attention and Auxiliaries in the center of context;  
**Initialize:** Progressive Attention Network  $f$  with random weight parameters  $W$   
**Initialize:** Action set  $A$

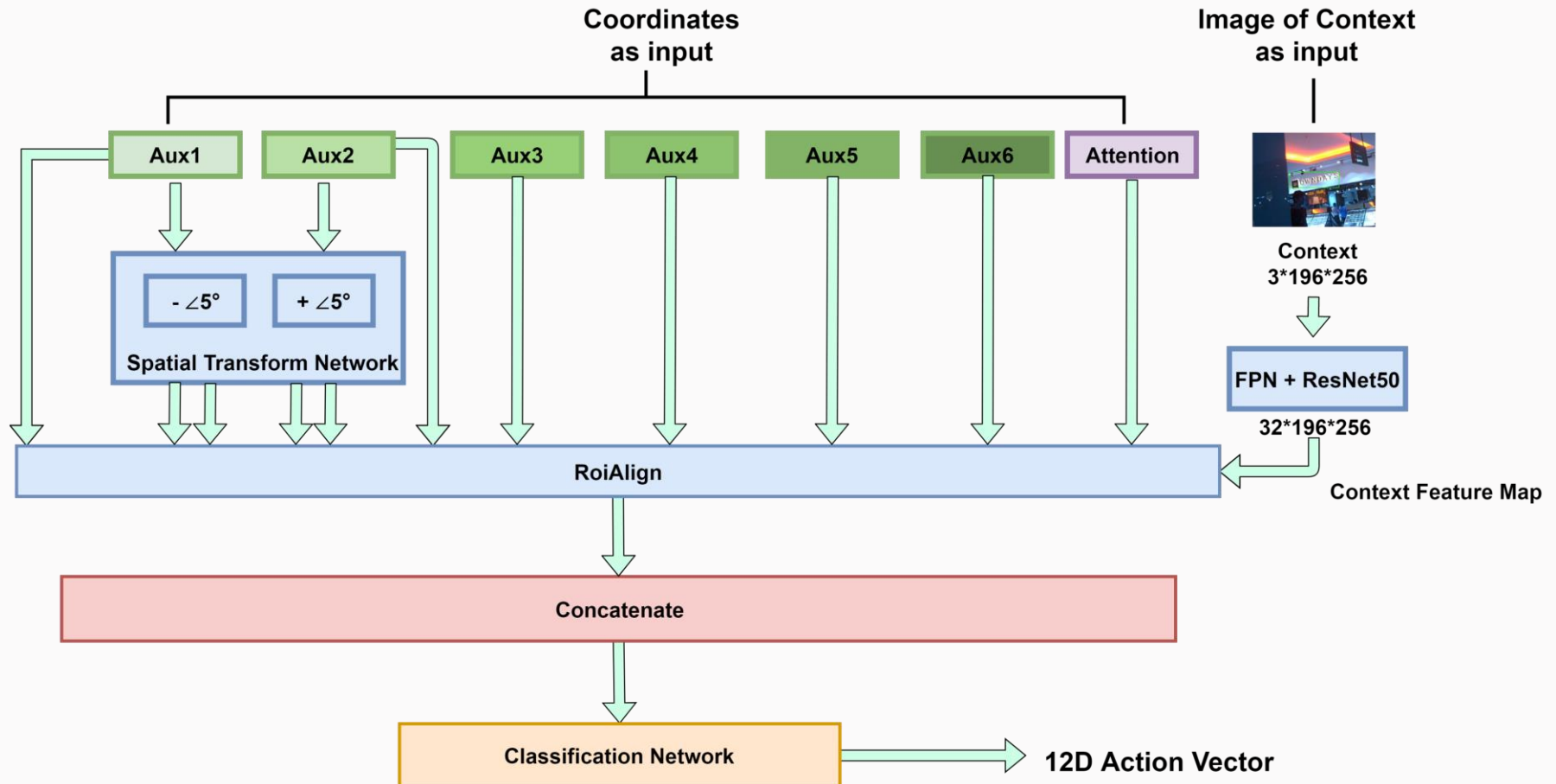
```
1 for epoch = 0, E do
2   for i = 0, C where C=number of available contexts
3     do
4       while t < T do
5         Observe current state: context  $s_c$ , attention
6         coordinates  $s_a$  and auxiliary coordinates
7          $s_{aux}$ ;
8         for  $\forall a \in A$  do
9           Execute action  $a$  in emulator and
10          observe reward  $r_i$ ;
11          Revert state;
12        end
13        Set reward vector  $\vec{R} \leftarrow (r_1, r_2, \dots, r_n)$ ;
14        Set approximated reward vector
15         $\vec{R}' \leftarrow f(s_c, s_a, s_{aux}, W)$ ;
16        Perform a gradient descent step on
17         $Loss(\vec{R}', \vec{R})$ ;
18        Select random action  $a_i \in A$  and execute
19        action  $a_i$  in emulator;
20        Incr  $t$ ;
21      end
22    end
23  end
24 end
```

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Notice that, during the training process, the actual reward can be calculated by ground truth, so reinforcement learning strategy within one step can be transformed into a regression problem.

# REINFORCEMENT LEARNING MODULE.1





# REINFORCEMENT LEARNING MODULE.2





Q & A