What is Keke doing Now?
Model Dog Behavior from Live Stream

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Problem revisit

What we want to get out of the project?

- Is my dog active now?
- How long he/she sleeps everyday?
- When does him eat/drink?
- Is he/she in his play pan?
- …

Sample rate: 1 frame per second

Motion scope: >= 20 seconds

Hi, my name is Keke (科科 in Chinese, Kaká in French, ケケ in Japanese, Keke in Indonesian/Unicode, etc.) -- I do support universal word embedding now.

I am a bug-free and active/online/several shots, general purpose intelligent system that moves around using 4 3-DOF(degree of freedom) brown/white legs (Aka. Shiba Inu Dog). I am originally from Arkansas and Hao flight with me for 5 hours to get back to my new home at Stanford. I am here to help Hao with his Ph.D. research in AI and Applied Research at Landing AI. I am very hands-on (or actually legs-on) and sometimes pull Hao too much to my direction. That been barked, Hao did an excellent job in the curriculum design -- we will see how the training goes.

Fun fact: I use a data structure of circle-dance as the counter for floors in the elevator, see the following:
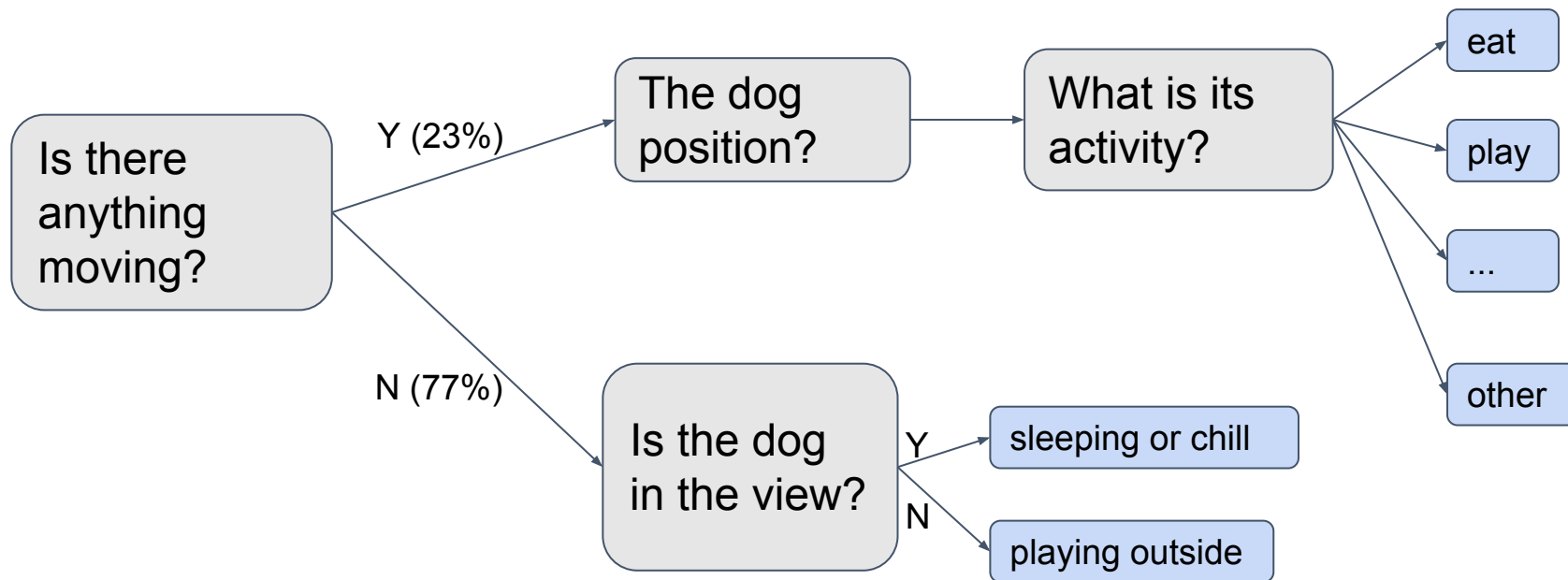
System Design

Motion Detection   **Position Detection**   **Activity Classification**

Motion Detection - Problem

Difficulties:

- Fast changing light conditions
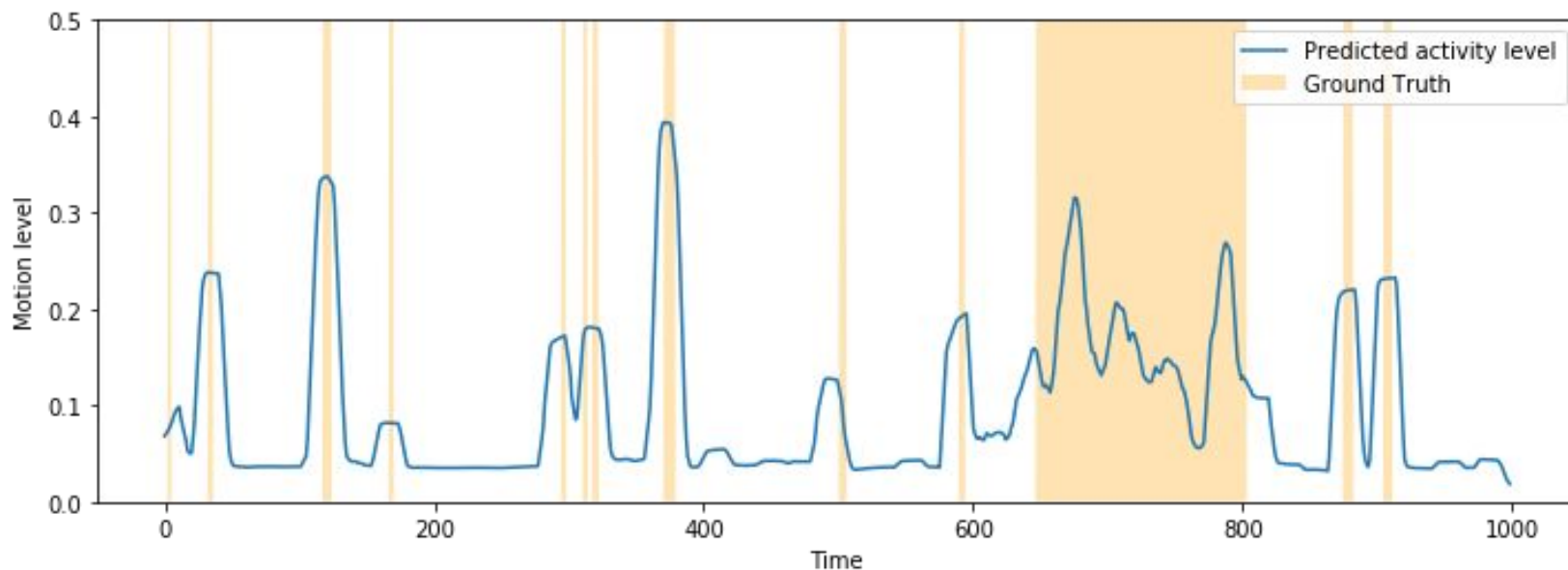- Motion during sleep
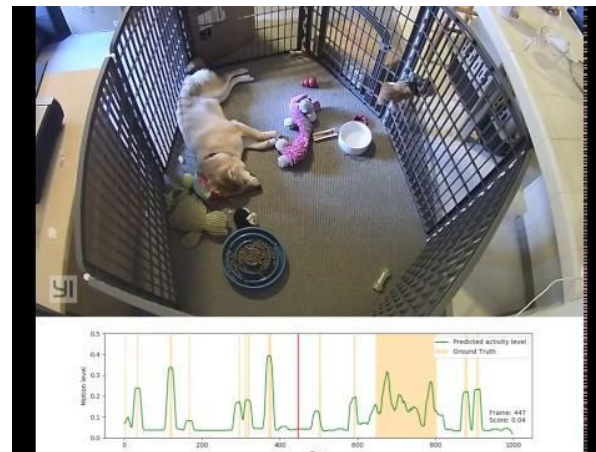- Fast computing (>15fps)

Algorithm:

- Gaussian blur; Moving average; Gradient; Suppression
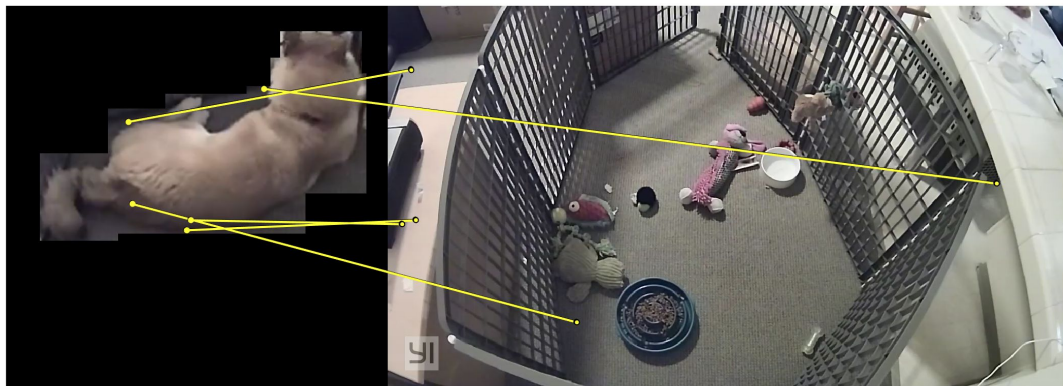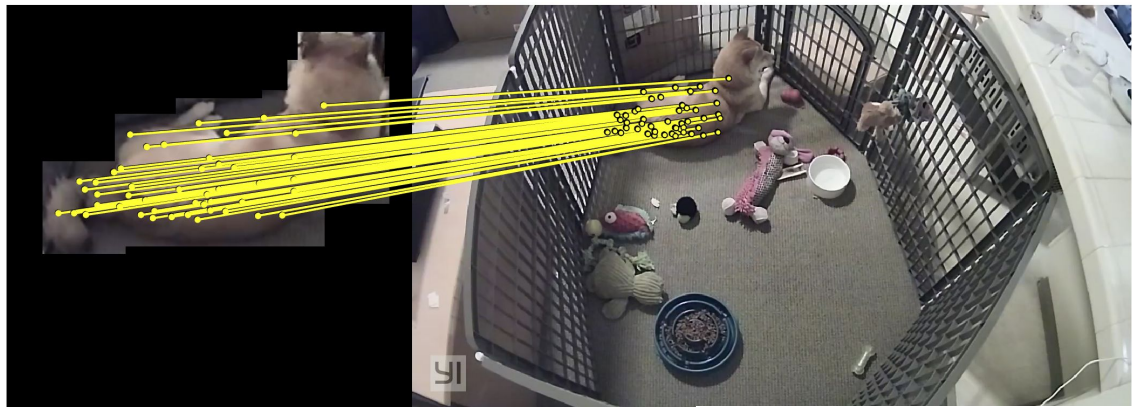- Closing; Squared Sum;Moving average

Motion Detection - Result

Speed: 164 frames/sec

Cross entropy score - 0.4459

Position Detection I - Is dog in the view?

Position Detection II - Where is the dog?

Steps:
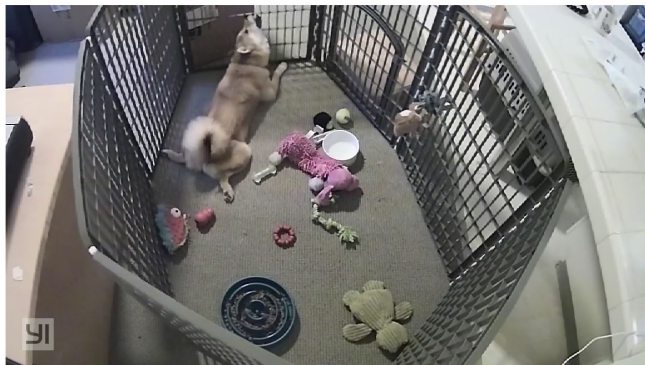- Two datasets based on mean
- Background subtraction :

  Background[t] := m × Background[t-1] + (1 - m) × New[t]

- Binary erosion
- Centroid

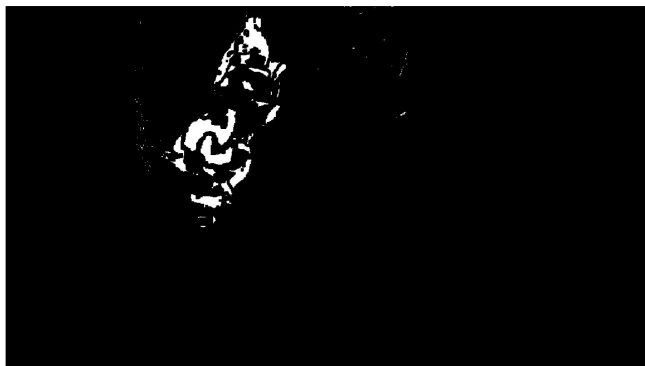Difficulty:
- Light, accuracy

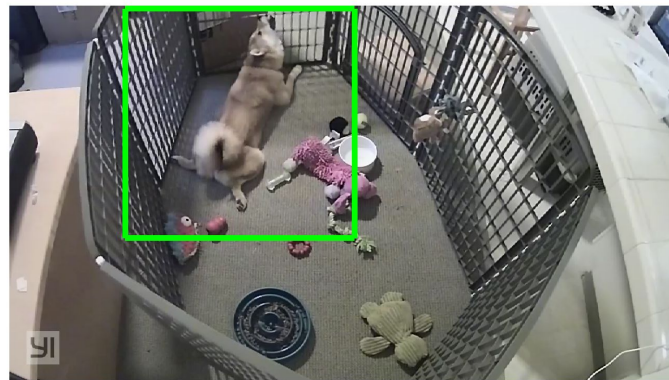# Position Detection

Test Image from Dataset 1

Background Subtraction

Erosion

Dog position

Position Detection

Test Image from Dataset 2

Background Subtraction

Erosion

Dog Position

Activity Classification

Eat:

- Edge detection
- Hough transform
- Difficulty: shadow

More activities

- Play

- ...

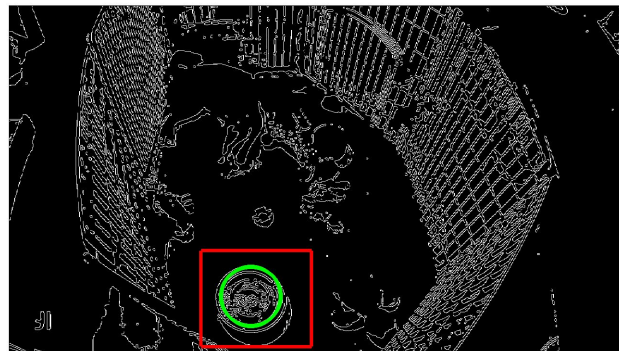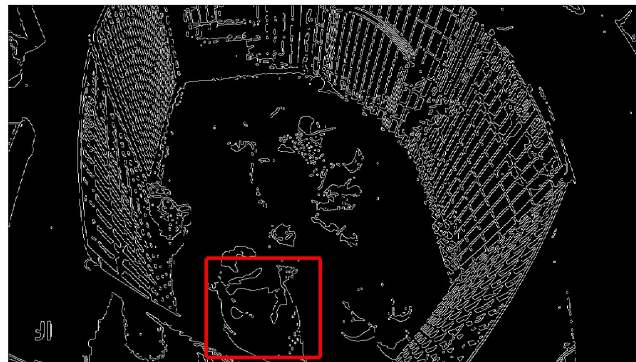# Activity Classification: Eat

Test Image 1

Not Eating

Test Image 2

Eating