



Who will survive? v1.0.0

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컴퓨터공학 이형진

목차

- 프로젝트 제안
- 수정 내용
- 프로젝트 내용
- 프로젝트 기능 및 구조
- 테스트
- GPU Server & MTES
- 보완할 점

프로젝트 제안

마블 영화에 등장하는 슈퍼빌런 타노스와의 대결
연속적으로 나타나는 사진과 몇 가지 단서를 이용하여 사라질 사
람들을 미리 예측

수정된 내용

시간이 충분하지 않고 장비 여건이 좋지 않아 영상처리에 관련된 YOLO, Grabcut 등의 방법의 비중을 살리고 메타 데이터는 삭제 Beta 버전 추후 업데이트 할 계획



수정된 내용

경희대학교 GPU 서버에서 Docker Container를 통한 yolo 이미지 학습

개체 : 아이언맨 사진 257개를 학습 후 가중치를 서버에 저장
(1개체 평균 학습 소요 시간 = 5시간)



프로젝트 내용



프로젝트 내용



프로젝트 내용



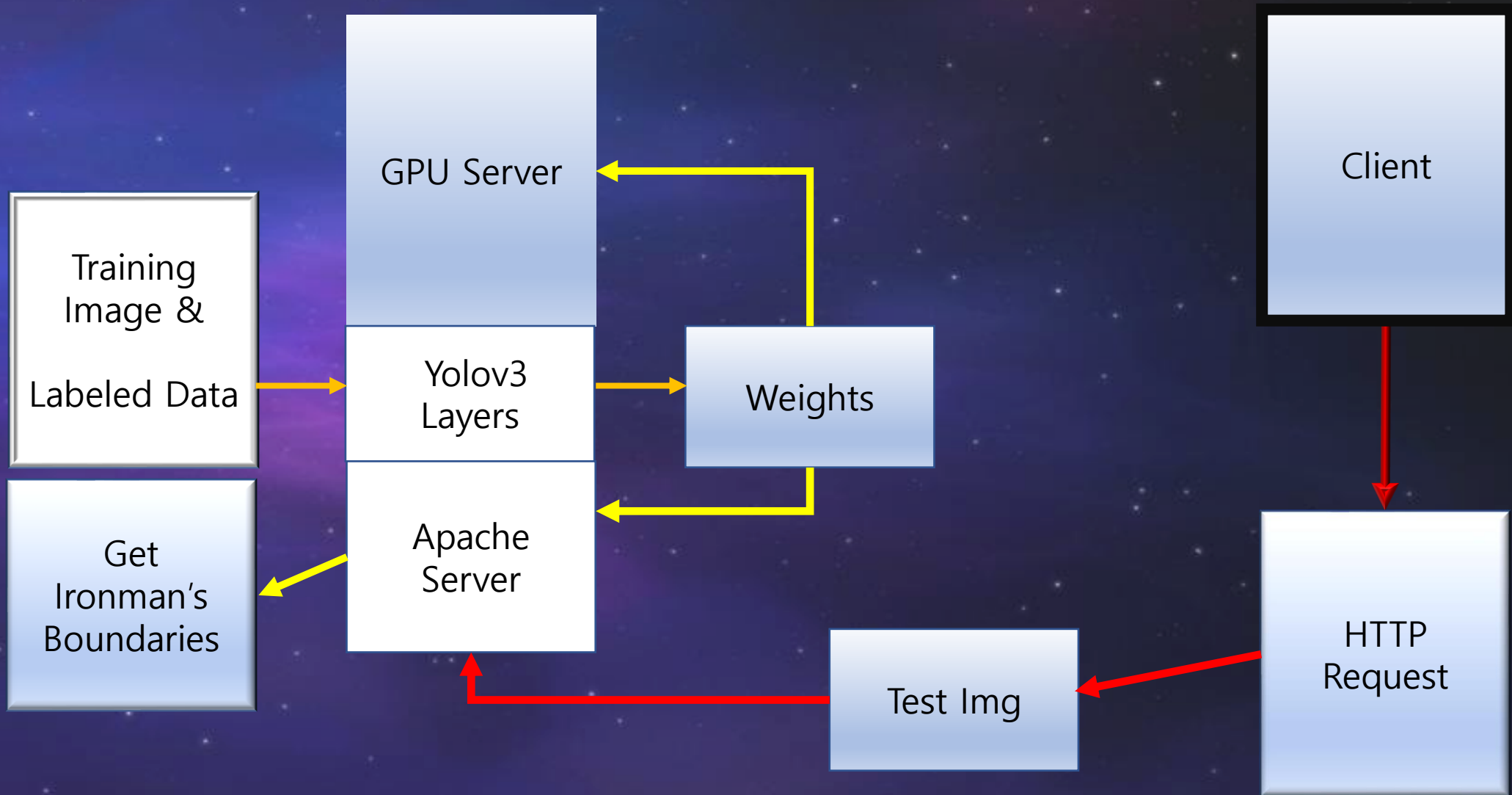
프로젝트 내용



프로젝트 기능

- Vanishing 함수 : 사진 속 **아이언 맨을 제외하고 모두 사라짐**
GrabCut 함수 : 추출된 아이언 맨의 신체 좌표를 잘라냄
- 핵심 기능 : YOLO Object Detection

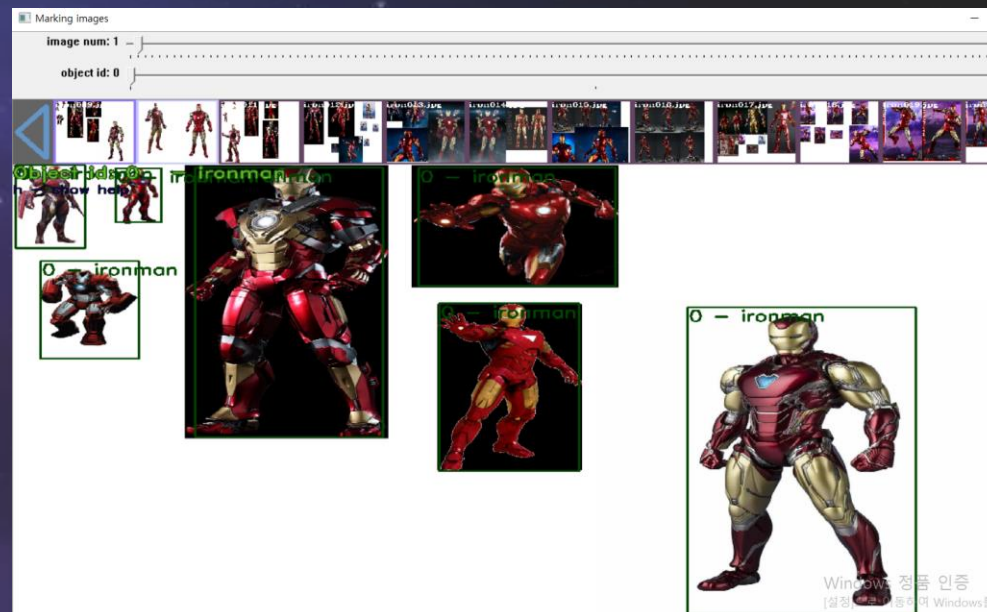
프로젝트 구조 (Client & Server)



학습

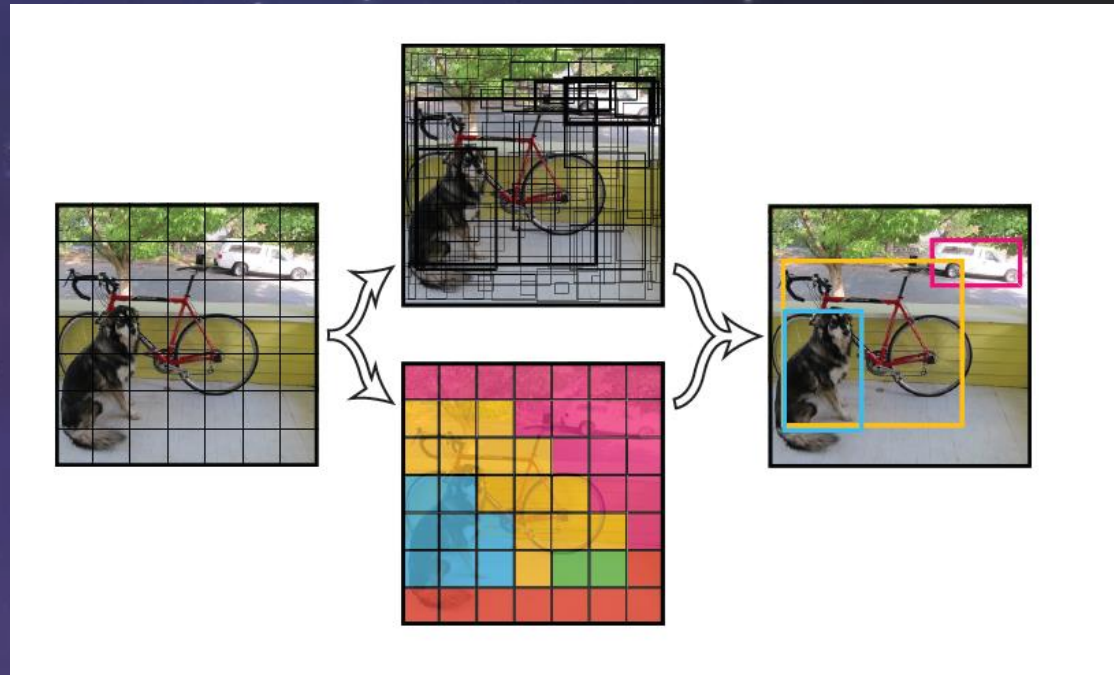
- Ubuntu 14.04 환경에서 진행
- Yolo_marker 프로그램을 사용하여 직접 labeling

```
root@titanQ2: /home/darknet
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
3369: 0.095579, 0.130491 avg, 0.001000 rate, 1.805400 seconds, 107808 images
Loaded: 0.000040 seconds
Region 82 Avg IOU: 0.816348, Class: 0.999253, Obj: 0.997563, No Obj: 0.002554, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000002, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.765402, Class: 0.999177, Obj: 0.499621, No Obj: 0.002875, .5R: 1.000000, .75R: 0.500000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.950671, Class: 0.999604, Obj: 0.997795, No Obj: 0.002270, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.863216, Class: 0.999609, Obj: 0.996902, No Obj: 0.001626, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.836039, Class: 0.999386, Obj: 0.928210, No Obj: 0.002028, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.709959, Class: 0.999950, Obj: 0.998433, No Obj: 0.001306, .5R: 1.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: 0.882808, Class: 0.999933, Obj: 0.993580, No Obj: 0.000514, .5R: 1.000000, .75R: 1.000000, count: 2
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.796122, Class: 0.999631, Obj: 0.999020, No Obj: 0.002232, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.910929, Class: 0.999426, Obj: 0.853935, No Obj: 0.002022, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.865624, Class: 0.999517, Obj: 0.994612, No Obj: 0.002688, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000002, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.835539, Class: 0.997638, Obj: 0.965193, No Obj: 0.002373, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.881476, Class: 0.999818, Obj: 0.996514, No Obj: 0.001531, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.919919, Class: 0.999877, Obj: 0.995986, No Obj: 0.001548, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.893221, Class: 0.999596, Obj: 0.998706, No Obj: 0.002886, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.872165, Class: 0.999198, Obj: 0.986501, No Obj: 0.002495, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000003, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
Region 82 Avg IOU: 0.768711, Class: 0.998247, Obj: 0.855050, No Obj: 0.003866, .5R: 0.750000, .75R: 0.750000, count: 4
Region 94 Avg IOU: 0.805142, Class: 0.999906, Obj: 0.999135, No Obj: 0.001235, .5R: 1.000000, .75R: 0.750000, count: 1
Region 106 Avg IOU: 0.894249, Class: 0.999599, Obj: 0.999117, No Obj: 0.000016, .5R: 1.000000, .75R: 1.000000, count: 1
Region 82 Avg IOU: 0.813367, Class: 0.999504, Obj: 0.960262, No Obj: 0.002325, .5R: 1.000000, .75R: 1.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000001, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000000, .5R: -nan, .75R: -nan, count: 0
3370: 0.077370, 0.125179 avg, 0.001000 rate, 1.912437 seconds, 107840 images
```



학습

- 1 개체 당 가장 이상적인 학습횟수 2000번
- 하이퍼 파라미터를 바꾸어 가며 8번 실험 후 가장 높은 정확도를 가진 가중치를 선택



테스트

- 정확한 검출



테스트

- 정확한 검출



테스트

- 정확한 검출



테스트

- 부정확한 검출



테스트

- 부정확한 검출



테스트

- 부정확한 검출



테스트

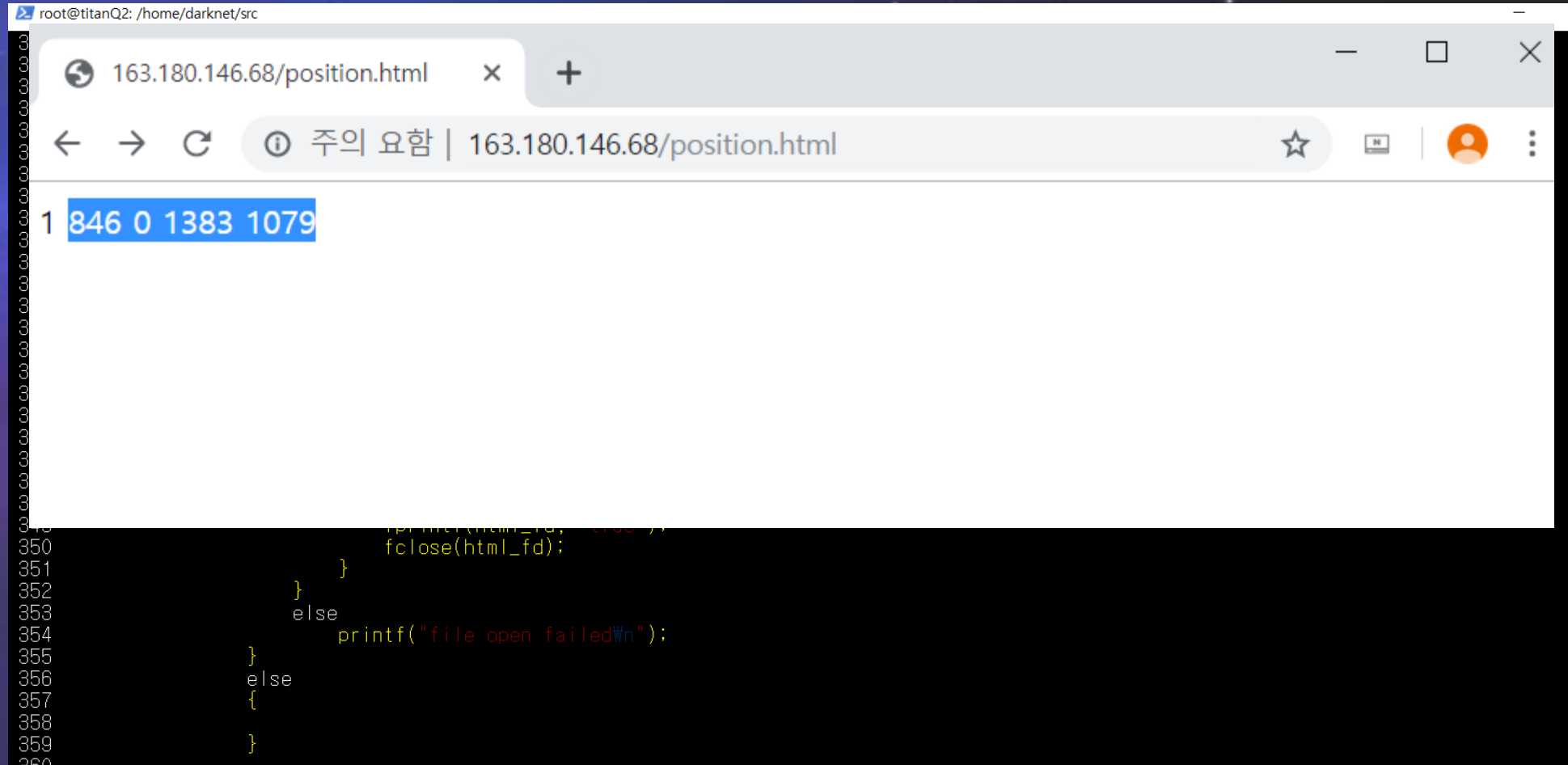
- 부정확한 검출



GPU 서버와 MTES와의 대화

```
root@titanQ2: /home/darknet/src
327         if (alphabet) {
328             image label = get_label(alphabet, labelstr, (im.h*.03));
329             draw_label(im, top + width, left, label, rgb);
330             free_image(label);
331
332             /*****
333             Edited
334             *****/
335
336             if(!strcmp(names[class], "ironman")) // if detects an ironman
337             {
338                 bBox++;
339                 printf("detected! %d\n", bBox);
340
341                 if(html_fd = fopen("www/position.html", "w")) // position file opened
342                 {
343
344                     fprintf(html_fd, "%d\n", classes); // number of classes
345                     fprintf(html_fd, "%d %d %d %d\n", left, top, right, bot); // save ironman's boundary info to a html file
346
347                     if(classes == class) // check if it is the last
348                     {
349                         fprintf(html_fd, "true");
350                         fclose(html_fd);
351                     }
352                 }
353                 else
354                     printf("file open failed\n");
355             }
356         }
357     }
358 }
359
360
```

GPU 서버와 MTES와의 대화



The image shows a web browser window and a terminal window. The browser window displays the URL `163.180.146.68/position.html` and the content `1 846 0 1383 1079`. The terminal window shows a C program snippet with line numbers 350 through 359.

```
root@titanQ2: /home/darknet/src
```

163.180.146.68/position.html

← → ↻ ⓘ 주의 요함 | 163.180.146.68/position.html

1 846 0 1383 1079

```
350     fprintf(stderr, "Error: %s\n", strerror(errno));
351     fclose(html_fd);
352 }
353 else
354     printf("file open failed\n");
355 }
356 else
357 {
358 }
359 }
```

Thank you

소스코드 :

<https://github.com/HyungjinLee/whoserves>