

# [**Eyes ON**]

**졸음운전 방지 솔루션**

**5군단 105정보통신단 상병 김동현**

**국군지휘통신사령부 상병 심규원**

## 프로젝트 소개



졸고 있는 운전자를 깨울 방법은 없을까?

## 제품 기능



### 얼굴 인식을 통한 졸음 감지

학습된 인공지능 모델을 이용해 사용자의 눈을 파악해 졸음 패턴을 분석합니다.



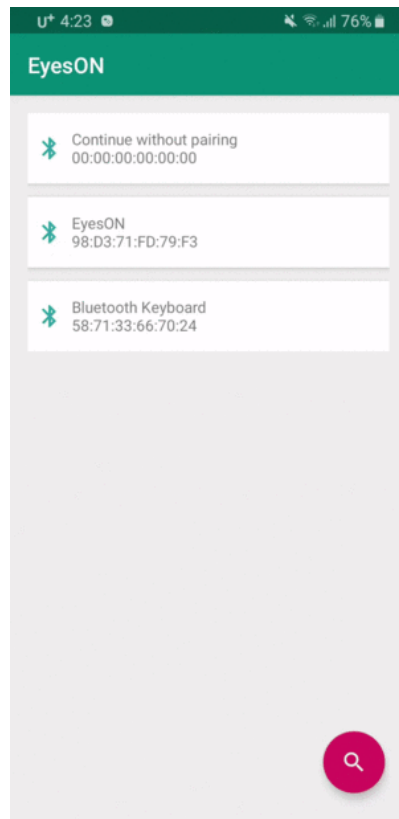
### 사용자의 졸음을 깨우는 피드백

모터 및 부저를 이용해 졸고 있는 사용자에게 경고를 줍니다.



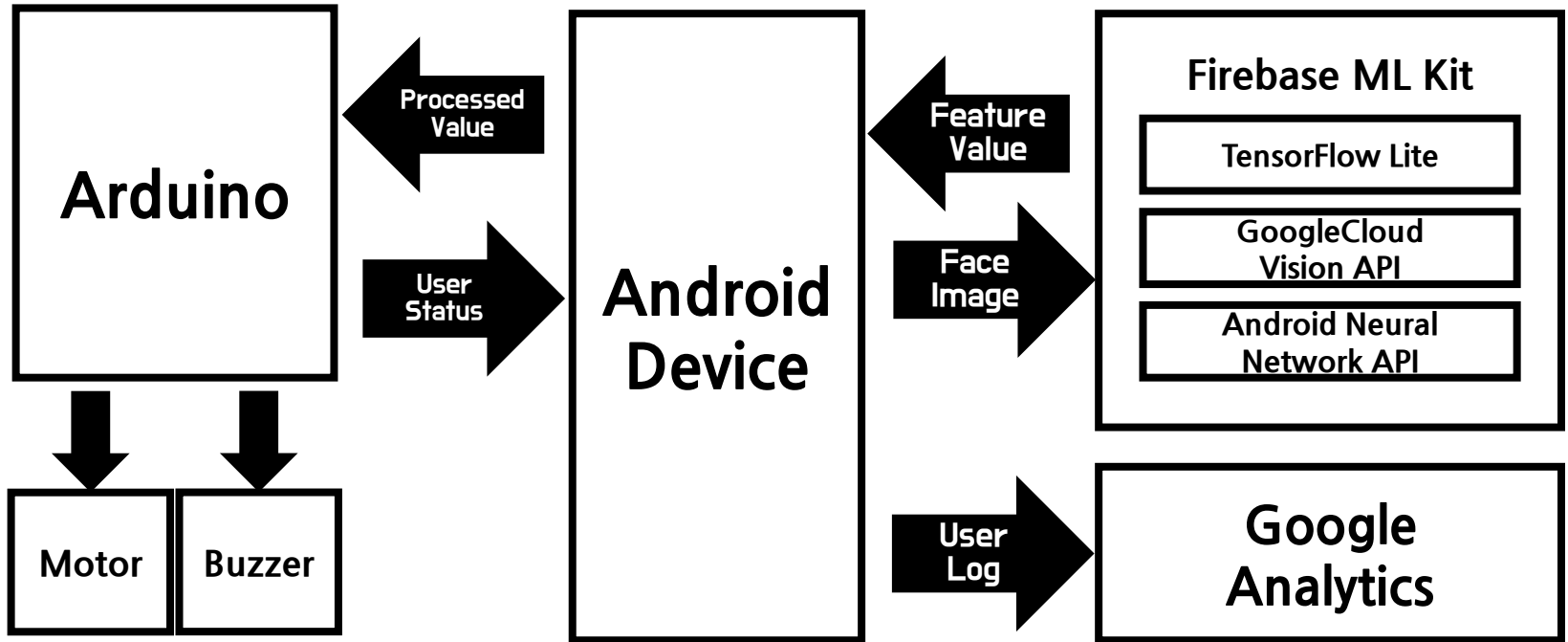
### 사용자 로그 데이터 분석

Google Analytics를 이용해 사용자의 로그 데이터를 분석합니다.



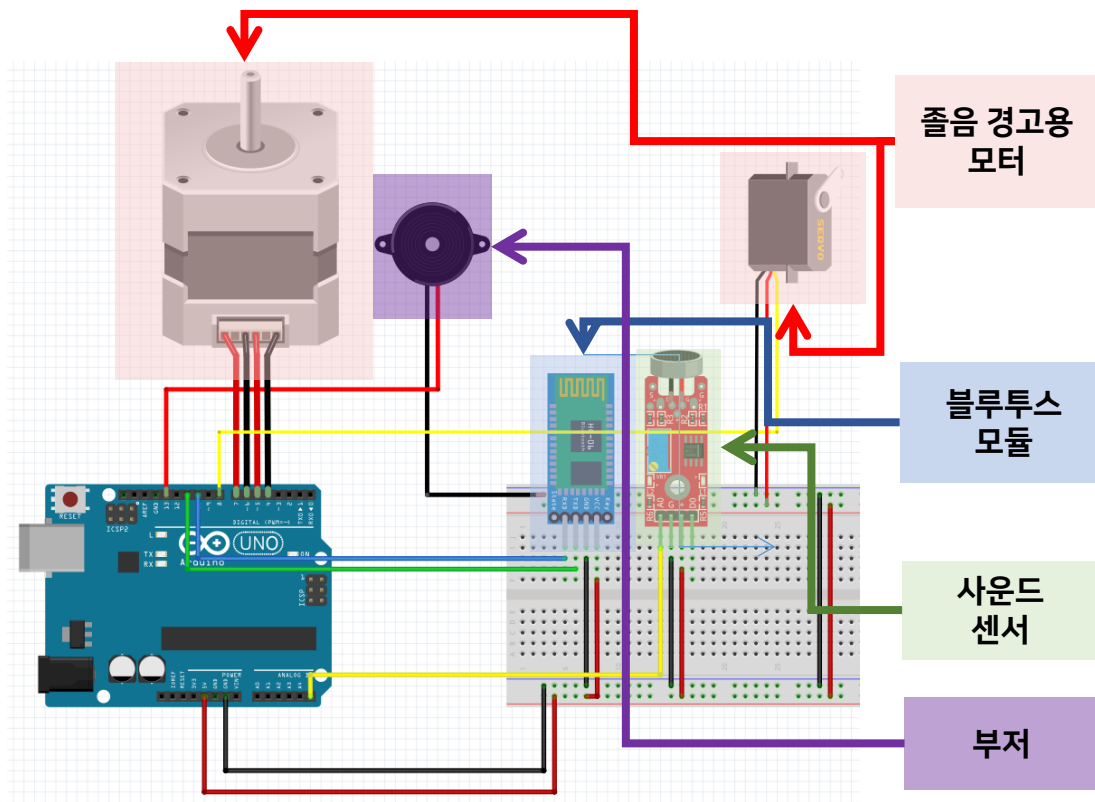
## 구현 방법 소개

### 블록 다이어그램



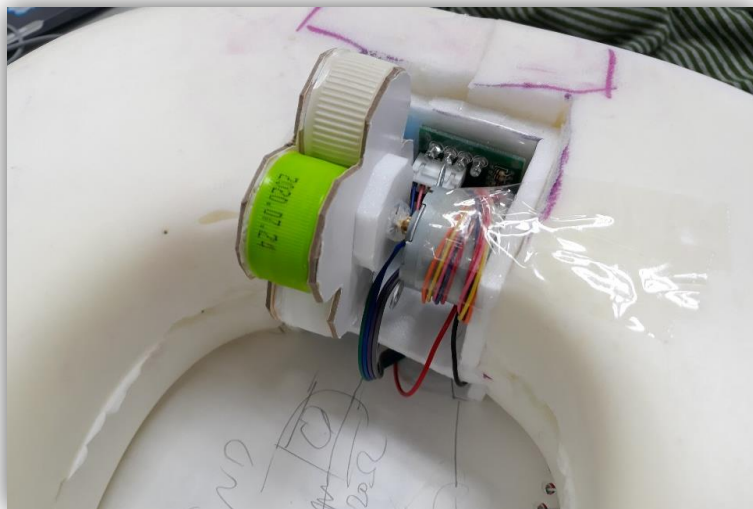
## 구현 방법 소개

### 아두이노 스케메틱

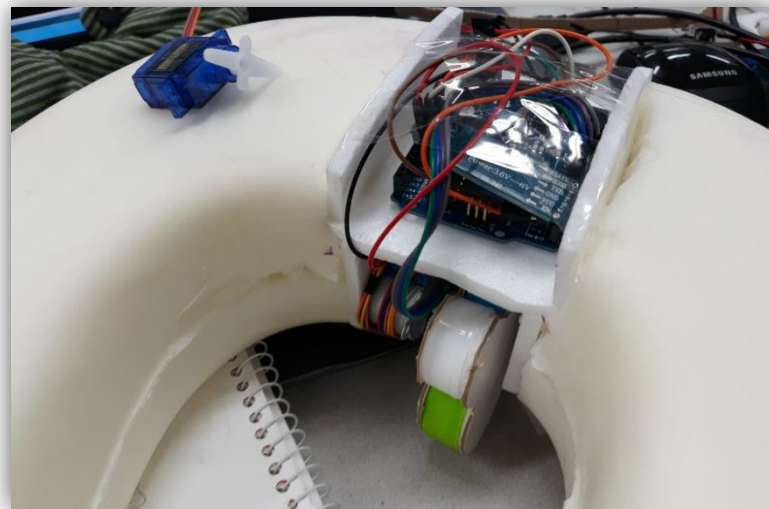


## [ 구현 방법 소개 ]

### 하드웨어 프레임

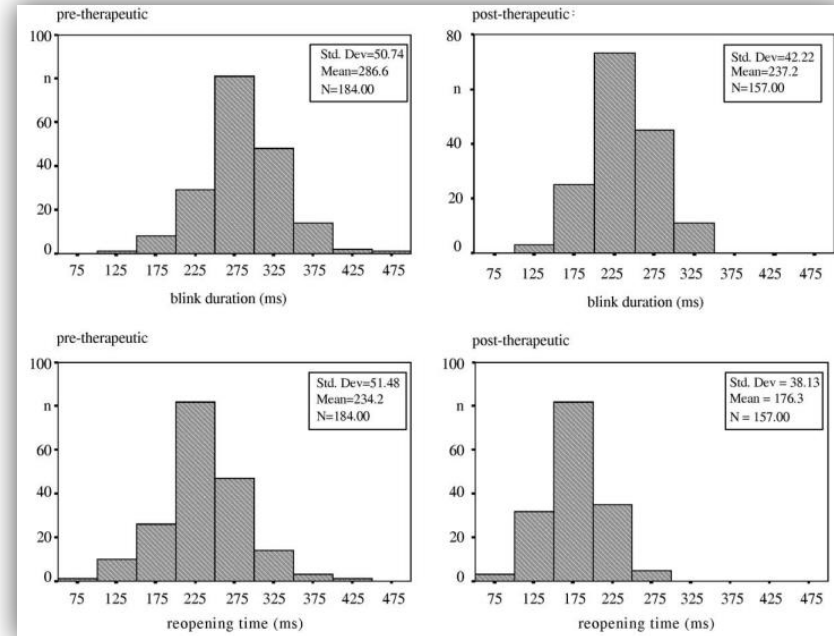
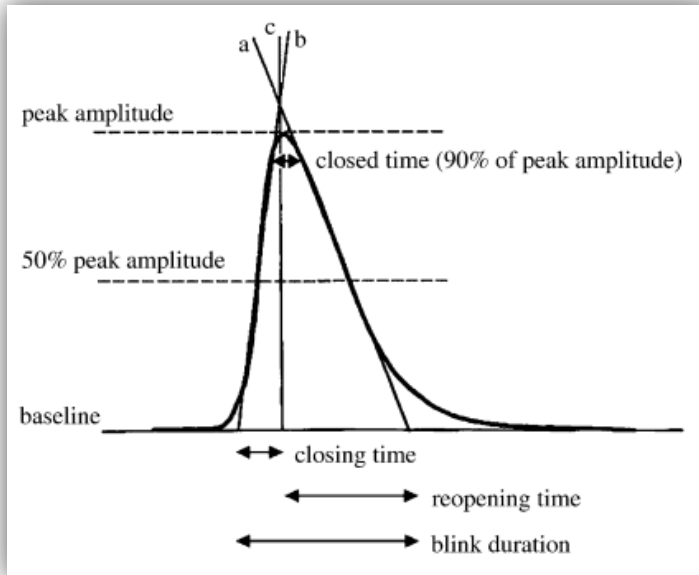


**스텝모터를 이용한 지압 마사지기**



**모터 및 블루투스 부품 결선**

# 소프트웨어 구성 졸음 감지 알고리즘



**The spontaneous eye-blink as sleepiness indicator in patients with obstructive sleep apnoea syndrome-a pilot study (2005)**

## 소프트웨어 구성

### 졸음 감지 알고리즘

#### B. Drowsiness Detection

We define three states for the driver drowsiness as seen in TABLE I. Considering the Caffier's study [13], the typical eye blink duration is less than 400ms on average and 75ms for minimum. For this reason, we used  $T_{Drowsy}=400\text{ms}$  and  $T_{Sleeping}=800\text{ms}$ .

TABLE I. THREE LEVEL FOR DROWSINESS.

Drowsiness Level	Description
Awake	Blink durations $< T_{Drowsy}$ .
Drowsy	Blink durations $> T_{Drowsy}$ and Blink durations $< T_{Sleeping}$
Sleeping	Blink durations $> T_{Sleeping}$

TABLE II. EXPERIMENTAL RESULTS IN TERMS OF ACCURACY, PRECISION AND RECALL OBTAINED IN THE JZU DATABASE.

Accuracy	94.8%
Precision	90.7%
Recall	71.4%
False Positive Rate (FPR)	1%

Drowsy Driver Detection System Using Eye Blink(2018)



## [ 통신 프로토콜(임시) ]

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### 1. Common: Connection Success [2 Byte]



### 2. Common : Raw data request [2 Byte]



### 3. Arduino->Phone : Processed data(doze) request [2 Btye]



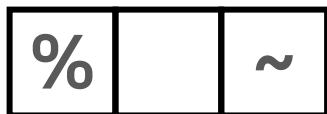
## [ 통신 프로토콜(임시) ]

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### 4. Common: Raw Data response [8 Byte]



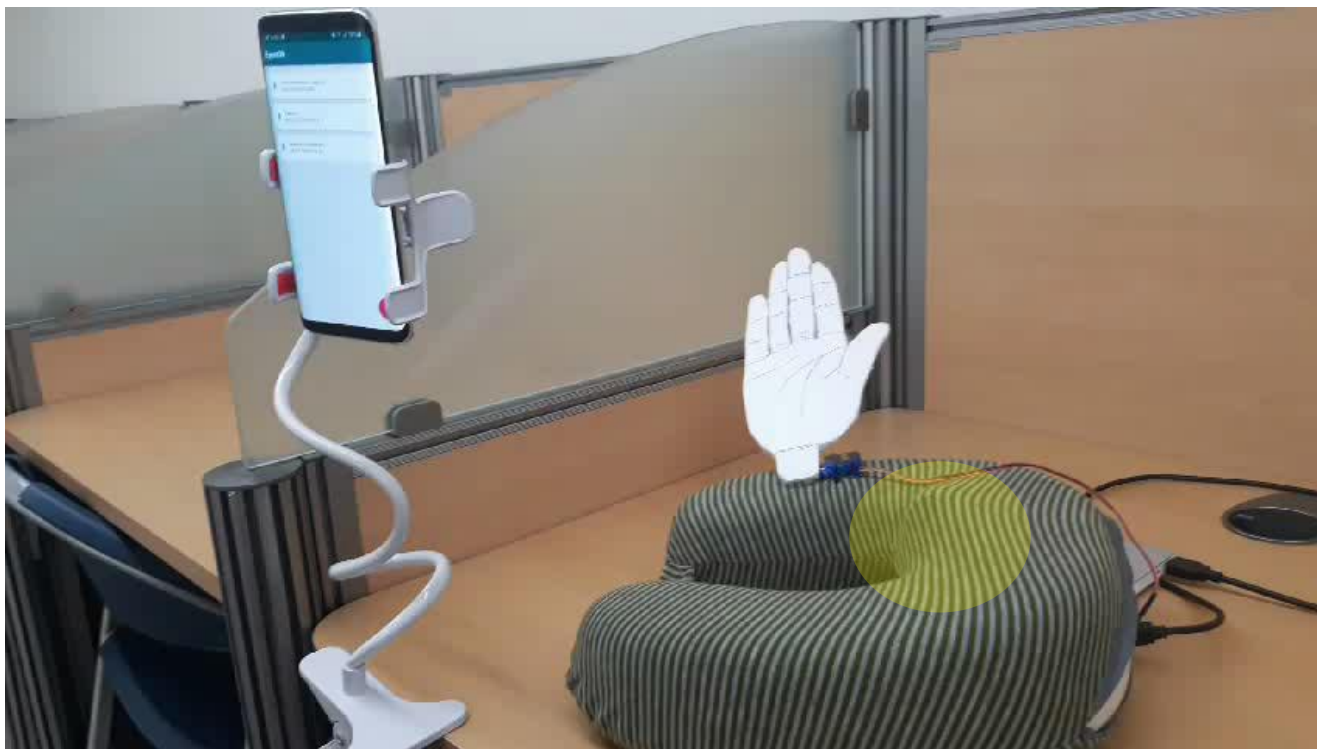
### 5. Phone→Arduino : Processed data(doze) response [3 Byte]



### 6. Phone→Arduino : Fail response [2 Byte]



## [ 작동 영상 ]



## 사업 전망 경쟁사업 분석

### 뷰메이트 DL330A 졸음운전 졸음경보 졸음방지 졸음

VUEMATE  
DL330A

DIALOG  
DRIVER STATE MONITOR



Drive State Monitor/졸음운전경보시스템

149,000 원

SK pay point 리뷰 작성시  
11번가 신한카드 첫결제  
[광고][장바구니쿠폰] 6,000원  
무이자 할부 최대22개월

11번

배송비 : 무료 | 도서산간비

☞ 모레 10/25(금) 도착

택배사 : CJ대한통운

별도의 디바이스 구입이 필요

### 소음형 졸음운전방지 졸음방지기 졸음경보기

2,400원

2,380 원



SK pay point 20P 적  
11번가 신한카드 첫  
[광고] 10월 혜택 : 장바  
무이자 할부 최대22

배송비 : 2,500원(50,000

주문시결제(선결제

경보형 졸음운전 방지기

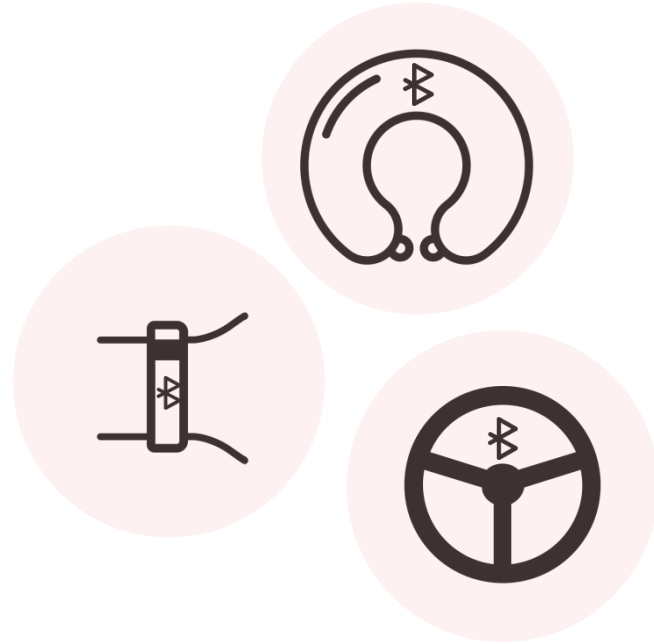
낮은 정확도로 인한 이용 불편

[ 사업 모델  
B2C ]



스마트폰  
어플리케이션  
(무료배포, 광고수익)

확장 디바이스가 없어도 일부 기능 이용 가능



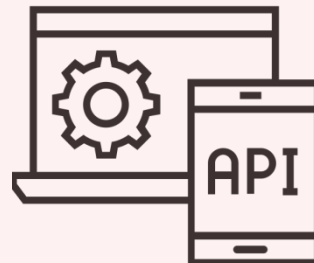
확장 디바이스 판매수익  
(쿠션, 핸들그립, 팔찌 등)

[ **사업 모델**  
**B2B** ]

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**내비게이션 제작 업체**



**API 판매 수익**

## 팀원 소개

국군지휘통신사령부  
상병 심규원


임베디드 개발  
프레임 제작














5군단 105정보통신단  
상병 김동현



안드로이드 개발  
프로젝트 관리


# 라이선스











 inerplat / EyesON

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 Code  Issues 2  Pull requests 0  Projects 1  Wiki  Security  Insights  Settings

Branch: master ▾ EyesON / LICENSE  

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# 라이선스

inerplat / EyesON

Branch: master EyesON / App / app / src / main / java / com / osam2019 / DreamCar / EyesON google

CameraSourcePreview.java

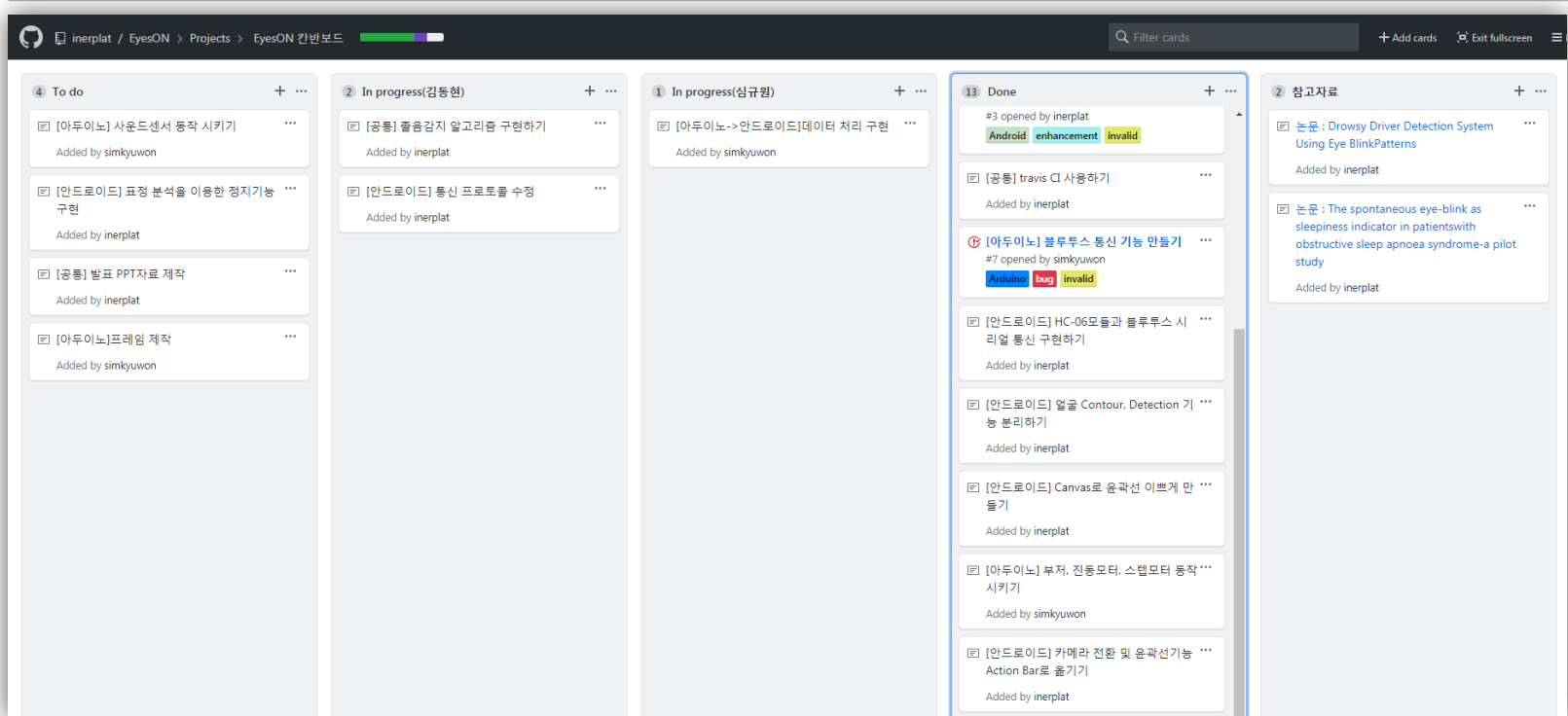
190 lines (161 sloc) 5.41 KB

```
1 // Copyright 2018 Google LLC
2 //
3 // Licensed under the Apache License, Version 2.0 (the "License");
4 // you may not use this file except in compliance with the License.
5 // You may obtain a copy of the License at
6 //
7 // http://www.apache.org/licenses/LICENSE-2.0
8 //
9 // Unless required by applicable law or agreed to in writing, software
10 // distributed under the License is distributed on an "AS IS" BASIS,
11 // WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
12 // See the License for the specific language governing permissions and
13 // limitations under the License.
14
15 // inerplat : onlayout() is changed : enlarge the screen to modify the ratio of the camera
16 package com.osam2019.DreamCar.EyesON.google;
```

타사의 라이선스 코드  
사용 시 폴더 분리 및 명시


Apache 라이선스 조항의  
**4. Redistribution**에 따라  
수정사항 명시

# DevOps



## 애자일-칸반 기반의 프로젝트 운영

# DevOps

inerplat / EyesON  build passing

Current Branches Build History Pull Requests More options

### Default Branch

✓ master 10 builds	# 56 passed 5 minutes ago	e99ff6c DH Kim	✓	✓	✓	✓	⊘
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### Inactive Branches

✓ drowsiness-timecheck-test 4 builds	# 53 passed about 8 hours ago	60791b8 simkyuwon	✓	✓	✓	✓	
✓ dataProcessing 3 builds	# 51 passed about 8 hours ago	3aaacf3 simkyuwon	✓	✓	✓		
! revert-15-createBluetoothProtocol 1 build	# 44 errored about 12 hours ago	e9bbfb7 DH Kim	!				
✓ createBluetoothProtocol 2 builds	# 39 passed about 12 hours ago	2db7c35 simkyuwon	✓	✓			
✓ ui-ux-change 6 builds	# 36 passed about 12 hours ago	a6a617b DH Kim	✓	✓	✓	✓	✓
✓ android-bluetooth-protocol-test 3 builds	# 34 passed about 12 hours ago	0302274 DH Kim	✓	✓	✓		

Travis.CI를 이용한 빌드 자동화

# DevOps

inerplat / EyesON

<> Code ① Issues 2 Pull requests 0 Projects 1 Wiki Security

Filters is:issue Labels 11 Miles

Clear current search query, filters, and sorts

- 2 Open 5 Closed Author Labels
- [아두이노] 타이머 인터럽트 2개 동작 안됨 **Arduino** **bug** **invalid**  
#17 opened 13 hours ago by simkyuwon
- [안드로이드] CameraPreviewActivity Thread delay 관련 **Android** **invalid**  
#16 by simkyuwon was closed 12 hours ago
- [안드로이드] 카메라 프리뷰 해상도 조정하기 **Android** **invalid**  
#12 by inerplat was closed 16 hours ago
- [공통] 통신 프로토콜 만들기 **Android** **Arduino** **enhancement**  
#10 opened 20 hours ago by simkyuwon
- [아두이노] 블루투스 통신 기능 만들기 **Arduino** **bug** **invalid**  
#7 by simkyuwon was closed 20 hours ago
- [안드로이드] 블루투스 페어링 기능 구현하기 **Android** **bug**  
#6 by inerplat was closed 21 hours ago
- [안드로이드] 카메라 라이브 프리뷰 띄우기 **Android** **enhancement** **invalid**  
#3 by inerplat was closed 19 hours ago

## [아두이노] 블루투스 통신 기능 만들기 #7

Closed

simkyuwon opened this issue 20 hours ago · 2 comments



simkyuwon commented 20 hours ago

Collaborator + 👤 ...

블루투스 시리얼 통신 아두이노에서 송신은 되는데 수신이 안됨



simkyuwon created this issue from a note in EyesON 칸반보드 (In progress(심규원)) 20 hours ago



inerplat added **Arduino** **bug** **invalid** labels 20 hours ago



inerplat commented 20 hours ago

Owner + 👤 ...

시리얼 통신으로 '문자 보내는데 2byte char "33"을 수신함  
아스키코드상으로 'I'가 33인데 수상함



inerplat commented 20 hours ago

Owner + 👤 ...

What is the difference between Serial.write and Serial.print? And when are they used?

Serial에서 print할수쓰지말고 write함수로 쓰세요



inerplat closed this 20 hours ago

Assignees

No one—assign yourself

Labels

**Arduino**  
**bug**  
**invalid**

Projects

EyesON 칸반보드  
Done ▾

Milestone

No milestone

Notifications

Customize

Unsubscribe

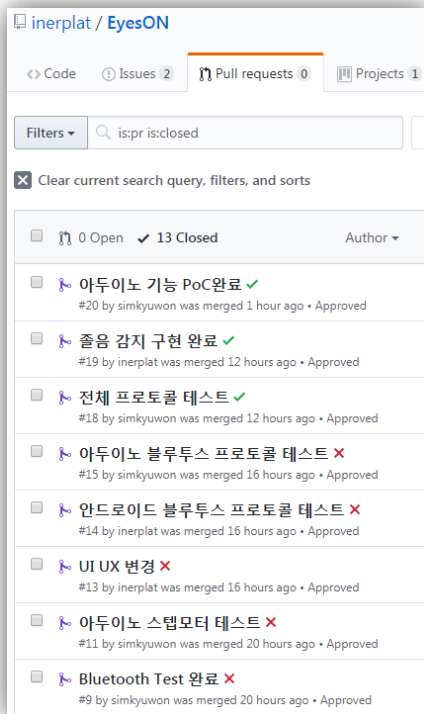
You're receiving notifications because you're watching this repository.

2 participants



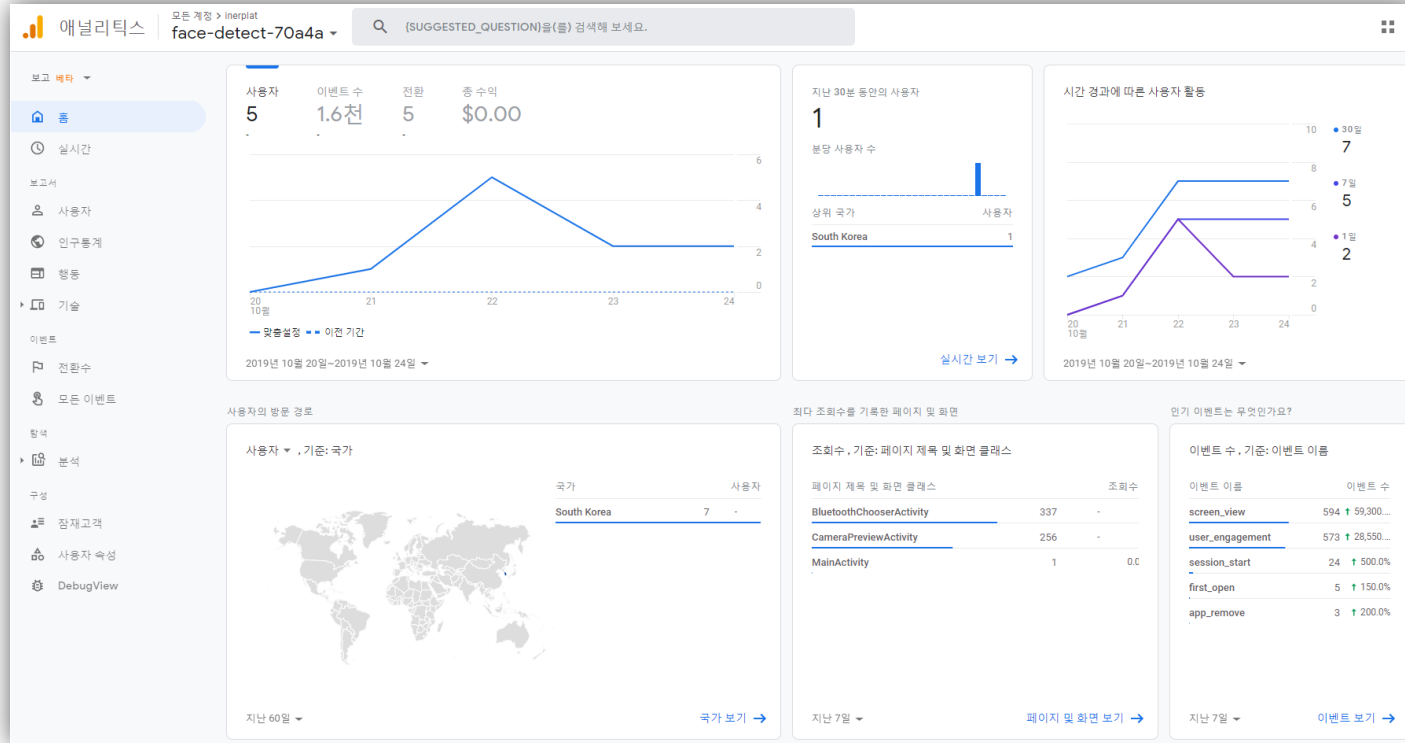
## Github Issue관리

# DevOps



## 기능 중심의 브랜치 관리

# DevOps



## Google Analytics를 이용한 사용자 패턴 분석

## [ 출처 ]

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#2 SBS뉴스 : [생활지혜] 1초만 졸아도... 생명 위협하는 '졸음운전'

#2 YTN NEWS : 경부고속도로서 8대 연쇄 추돌...2명 숨져 "졸음운전 추정"

#3 #13 #14 : Pictogram : [thenounproject.com](http://thenounproject.com)

#7 Philipp P. Caffiera , Udo Erdmannb , Peter Ullspergerb : The spontaneous eye-blink as sleepiness indicator in patients with obstructive sleep apnoea syndrome-a pilot study

#8 Taner Danisman, Ioan Marius Bilasco, Chaabane Djeraba, Nacim Ihaddadene : Drowsy Driver Detection System Using Eye Blink Patterns