

# MONITORING MOVEMENTS OF HUMAN EYE

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# Challenge

## ○ Problem:

It is necessary to find simple way to control people functional and psycho-emotional conditions

## ○ Solution:

Cheap firmware solution to process iris image to identify pupil center and control eye movement characteristics

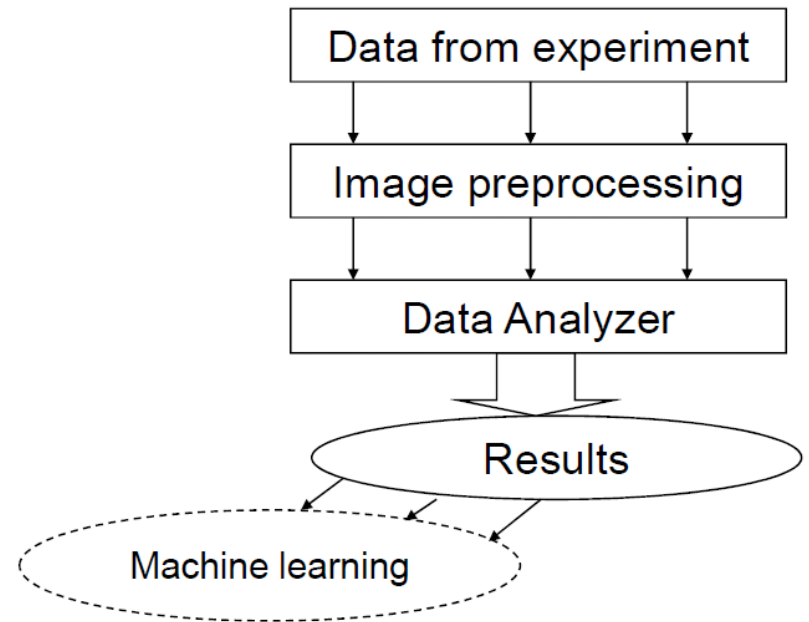
### Problem currency

- Usability
- Complexity disease detection.
- Simplification and accuracy determination of of alcohol or drug intoxication ascertainment.

APPROVED  
FOR  
Competition  
UMNIK

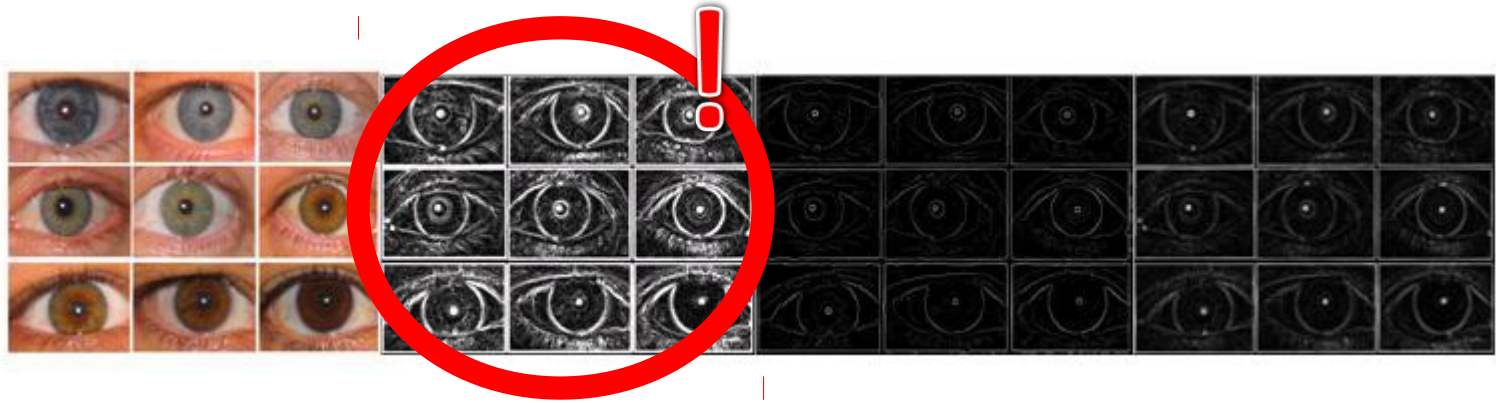
# Conception

- ❑ Experiments
- ❑ **Eye tracking**
- ❑ Physiological research
- ❑ Machine learning



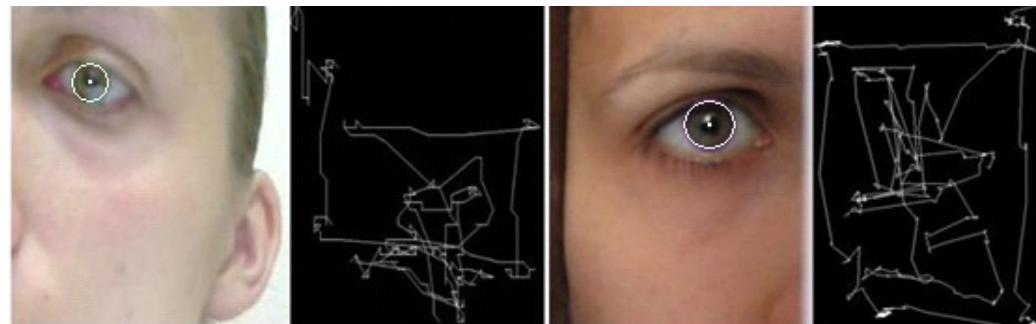
# Algorithms

Reference image, Sobel, Canny and Difference filters



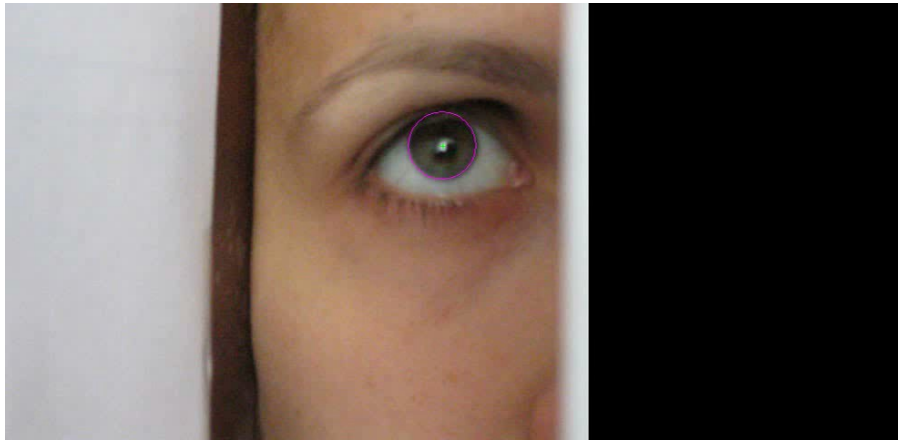
Video->FFMPEG->Sobel filter->Hough transform->FFMPEG->Video

Video->FFMPEG->Lab filter-> Calculate center of mass for image pixel->FFMPEG->Video

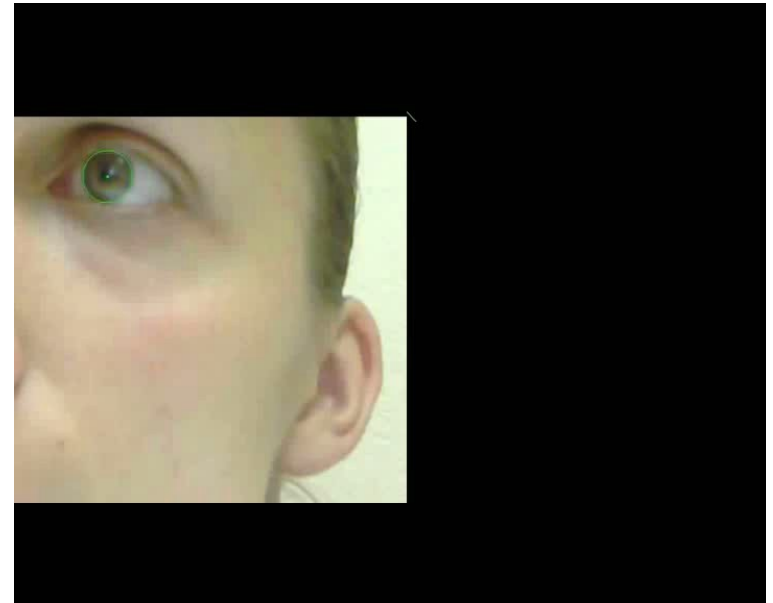


# Demo

## eyes-track with Canon



## eyes-track with nokia N900



## Hardware

Exp:



## Software

Construction of the trajectory the eye movements, determining areas of attention, the types of saccades

Determination of alcohol and drugs intoxication

Diagnosis of diseases





# Thank you for attention



## □ Team:

Diana Ilina

- Expert examination, recognition algorithms

Mikhail Smirnov

- Saccadic eye movement detection and analysis.

Ilya Lysenkov

- Detection algorithms, trajectory plotting

## □ Consultants

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