Lectures

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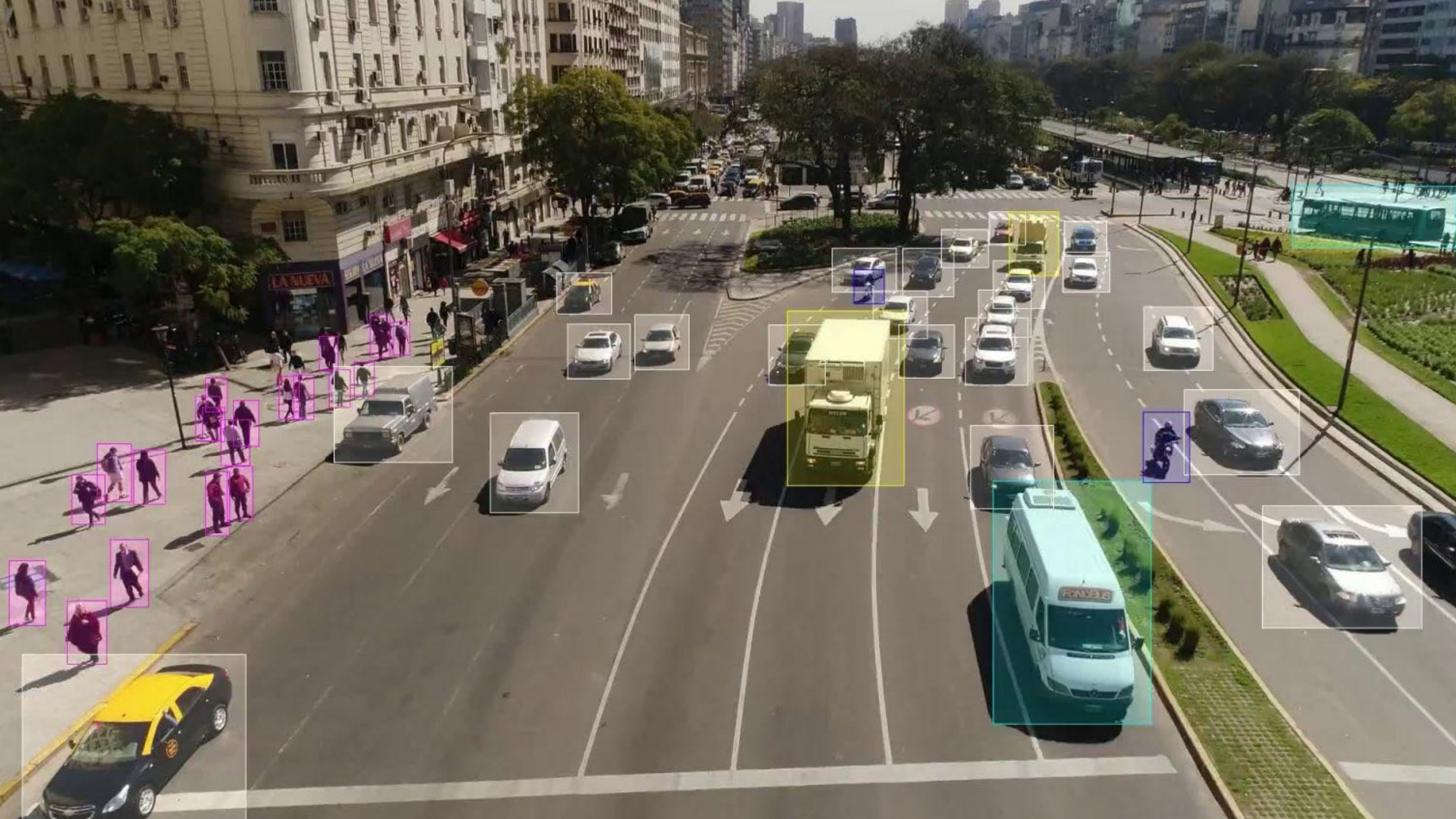
Introduction to Computer Vision

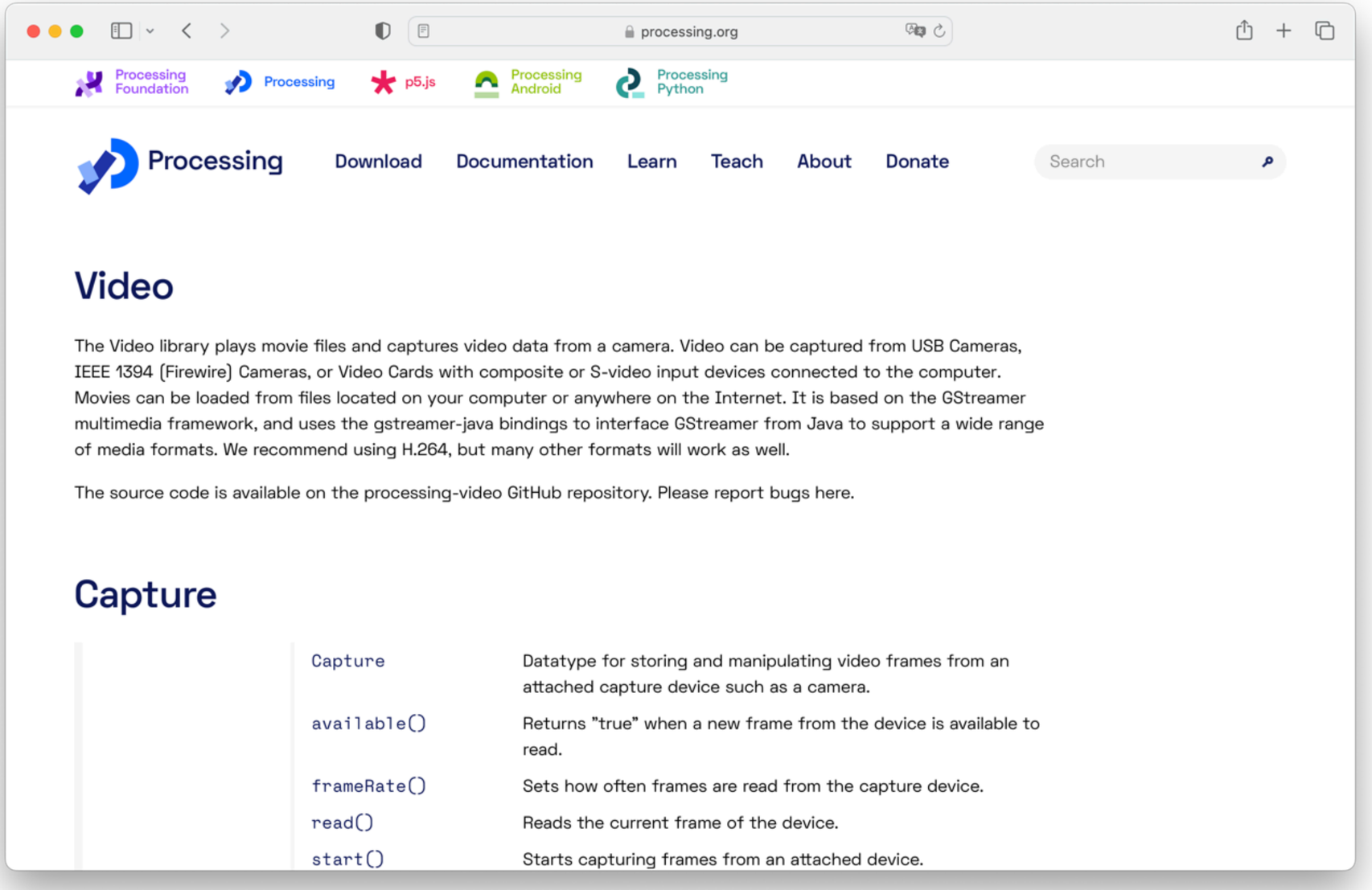
Introduction to Computer Vision for Creative Coding


logi

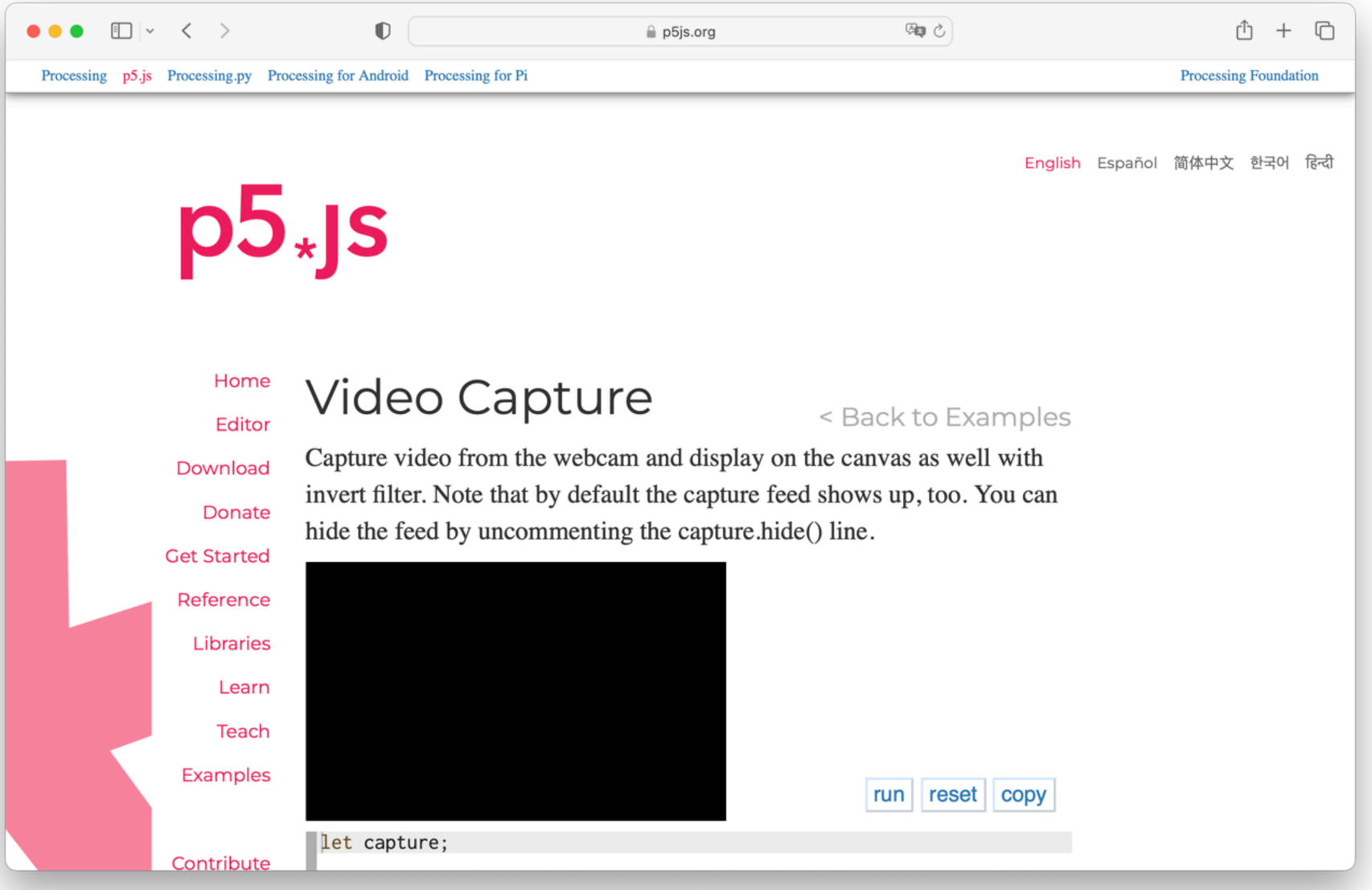

AXIS
AXIS
HIKVISION



LA NUEVA

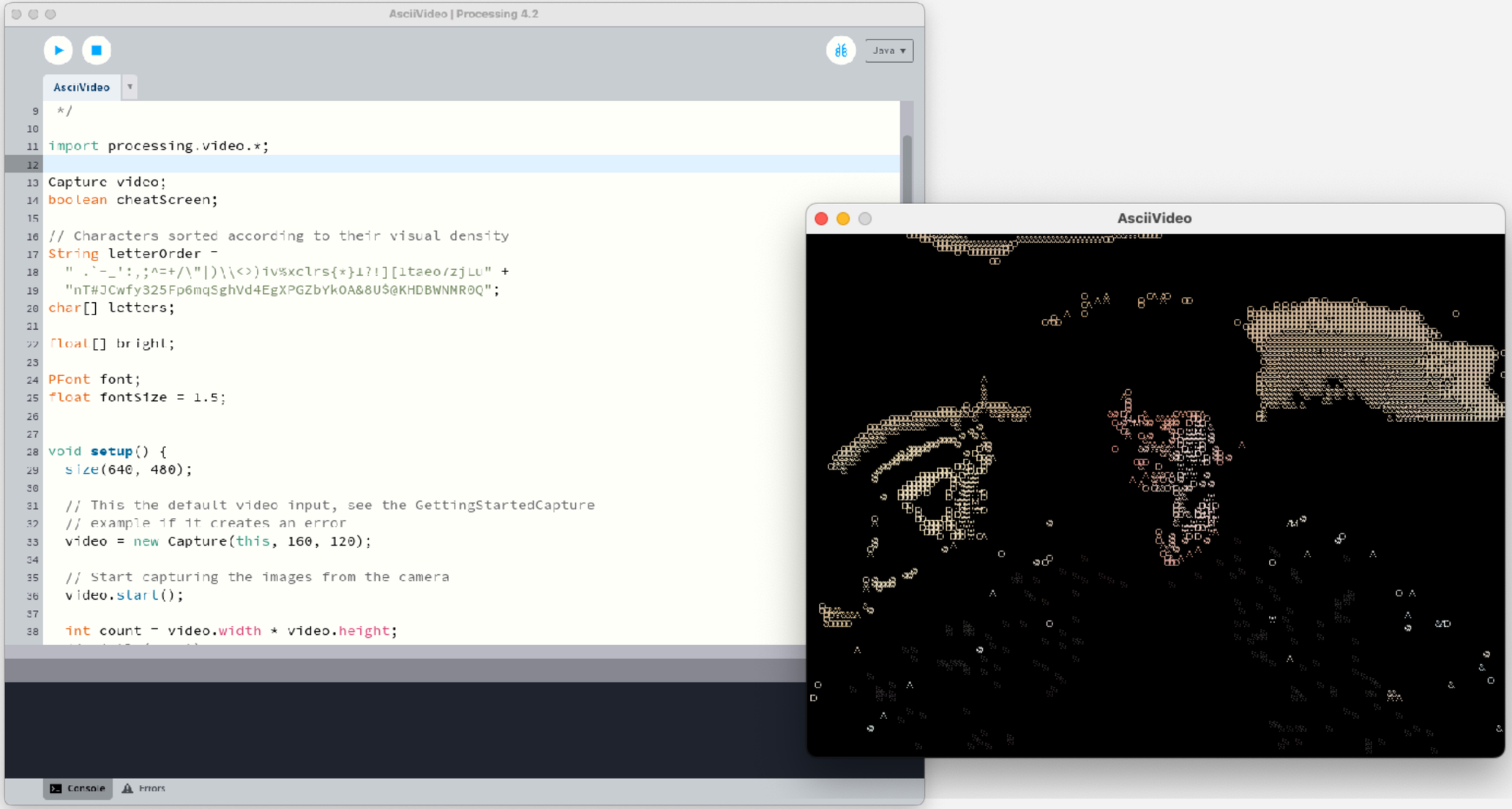
https://processing.org/download



https://processing.org/reference/libraries/video/index.html

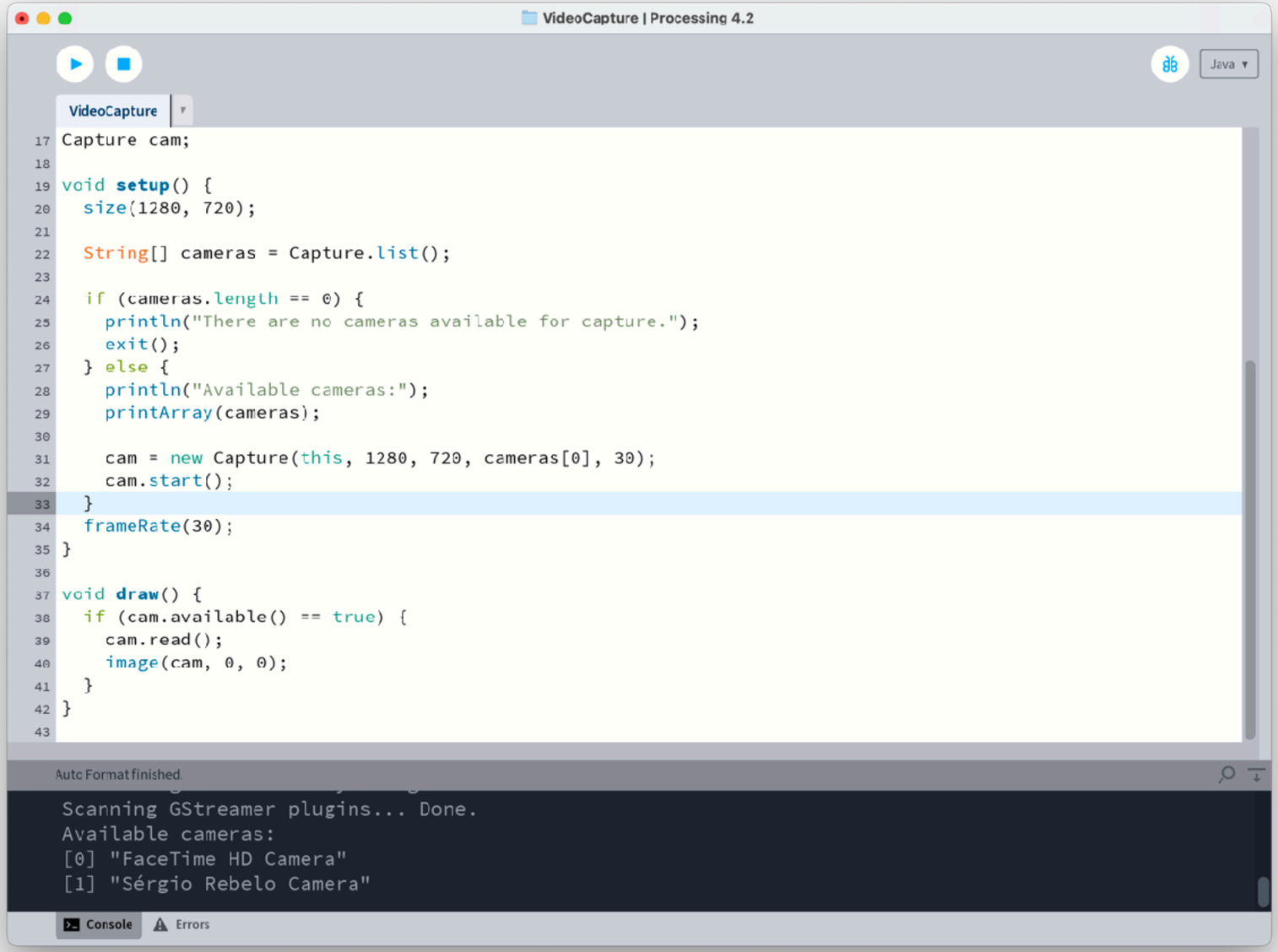


https://p5js.org/examples/dom-video-capture.html



https://processing.org/reference/libraries/video/index.html

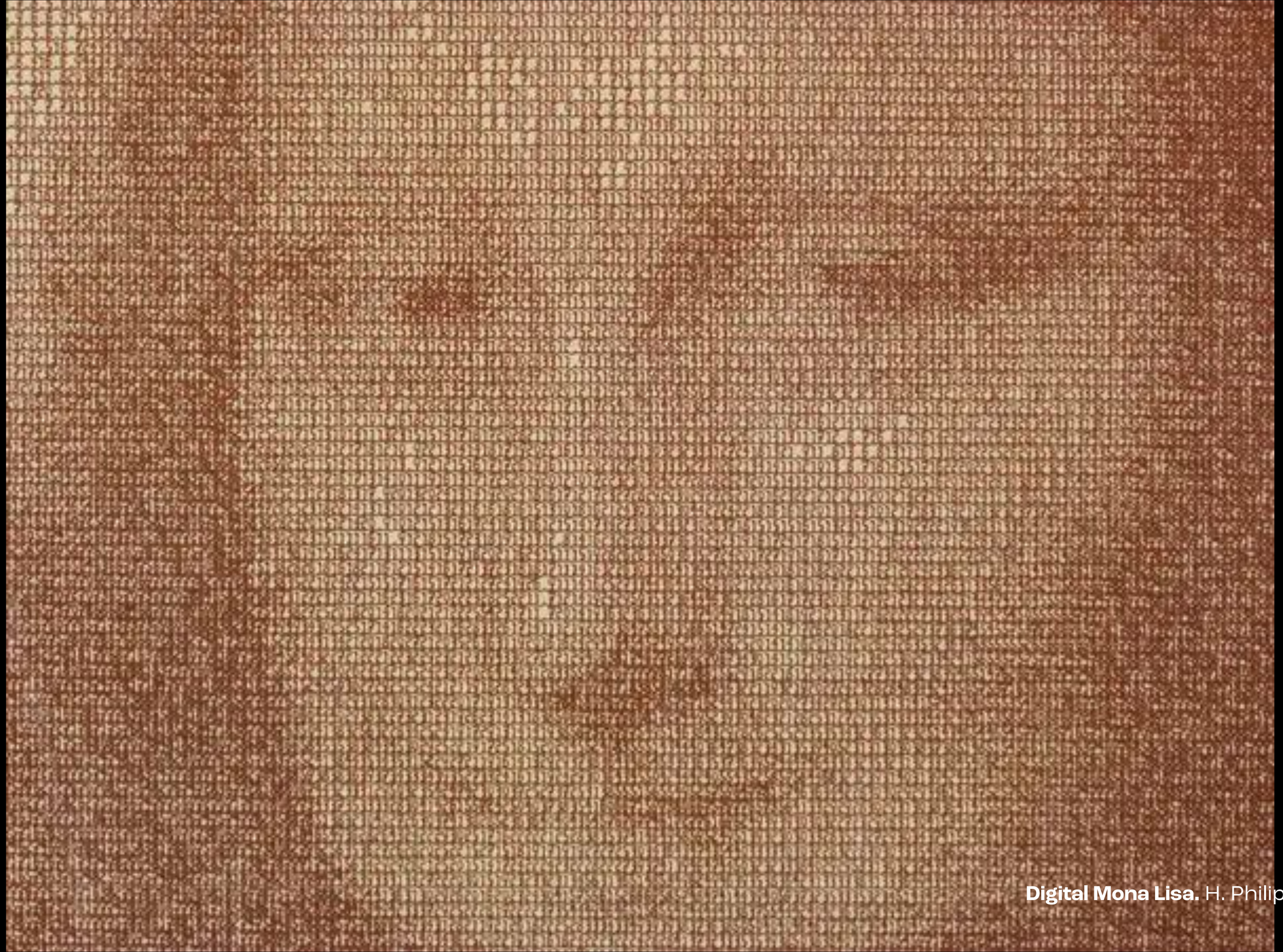
Live Video



Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Boilerplates/VideoCaptureBoilerplate

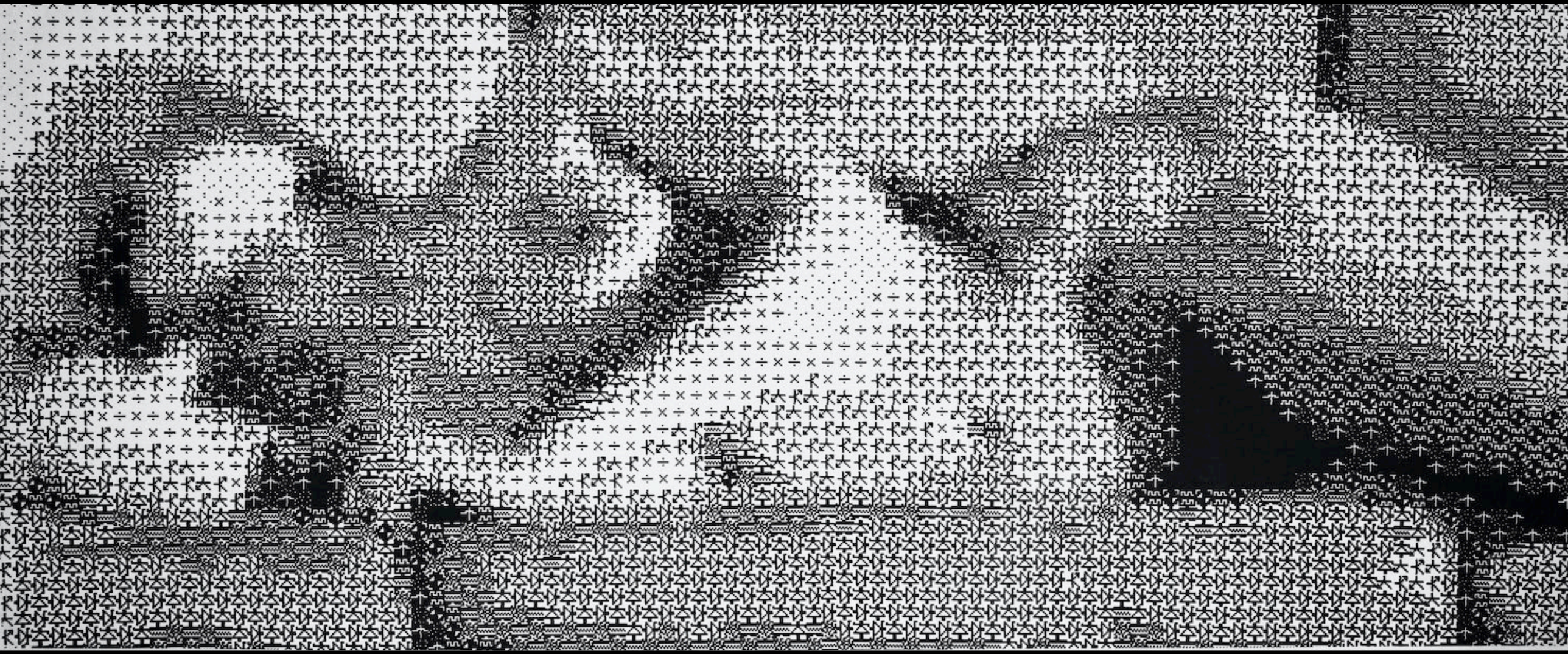
or Video library examples → Capture → GettingStartedCapture.

Software Mirrors

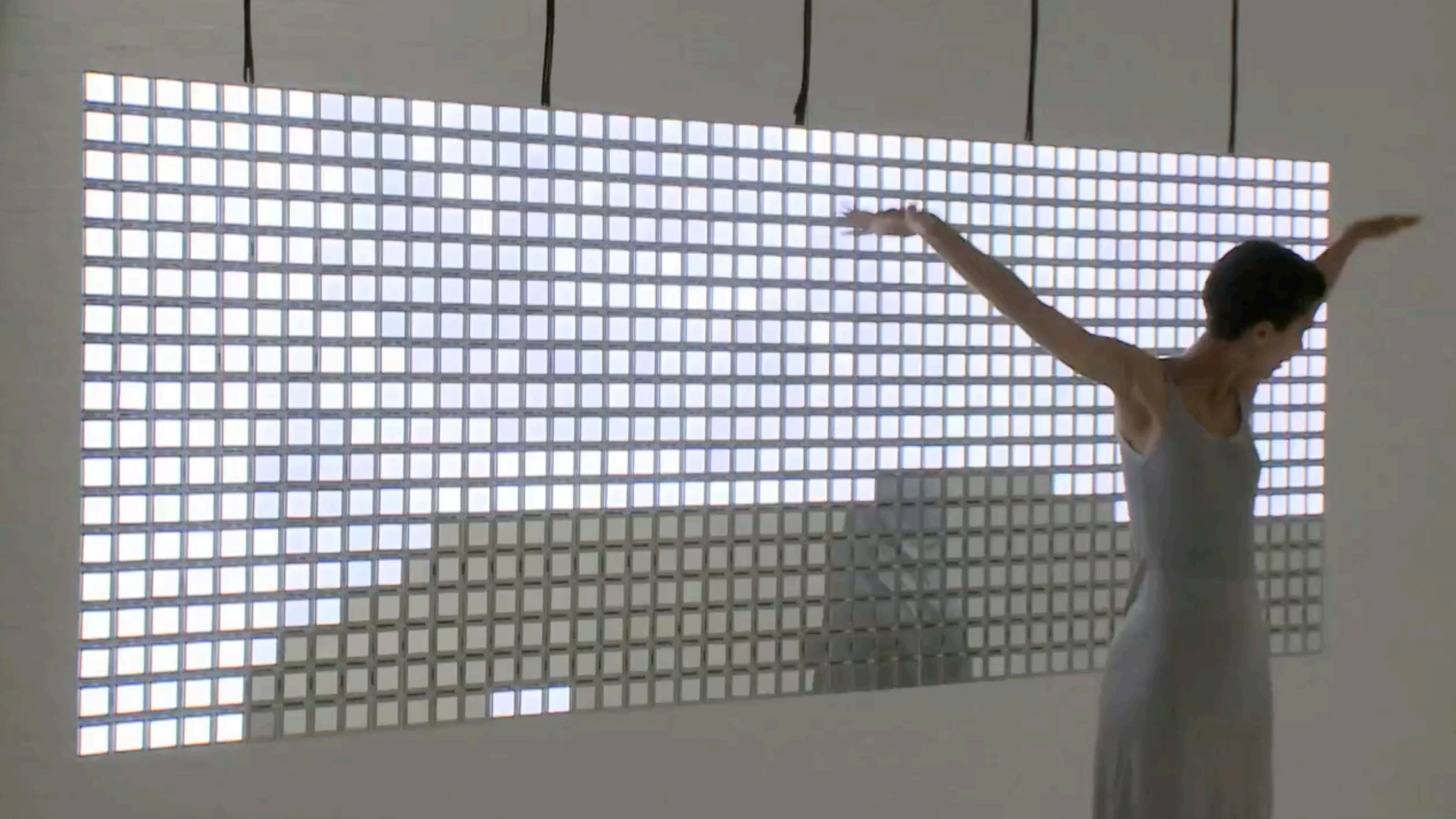


Digital Mona Lisa. H. Philip Peterson (1965)

Studies in Perception.
Kenneth C. Knowlton and Leon D. Harmon.
BELFIX. (1968)



Studies in Perception.
Kenneth C. Knowlton and Leon D. Harmon,
BELFIX. (1968)



Peg Mirror.
Daniel Rosin (2007)

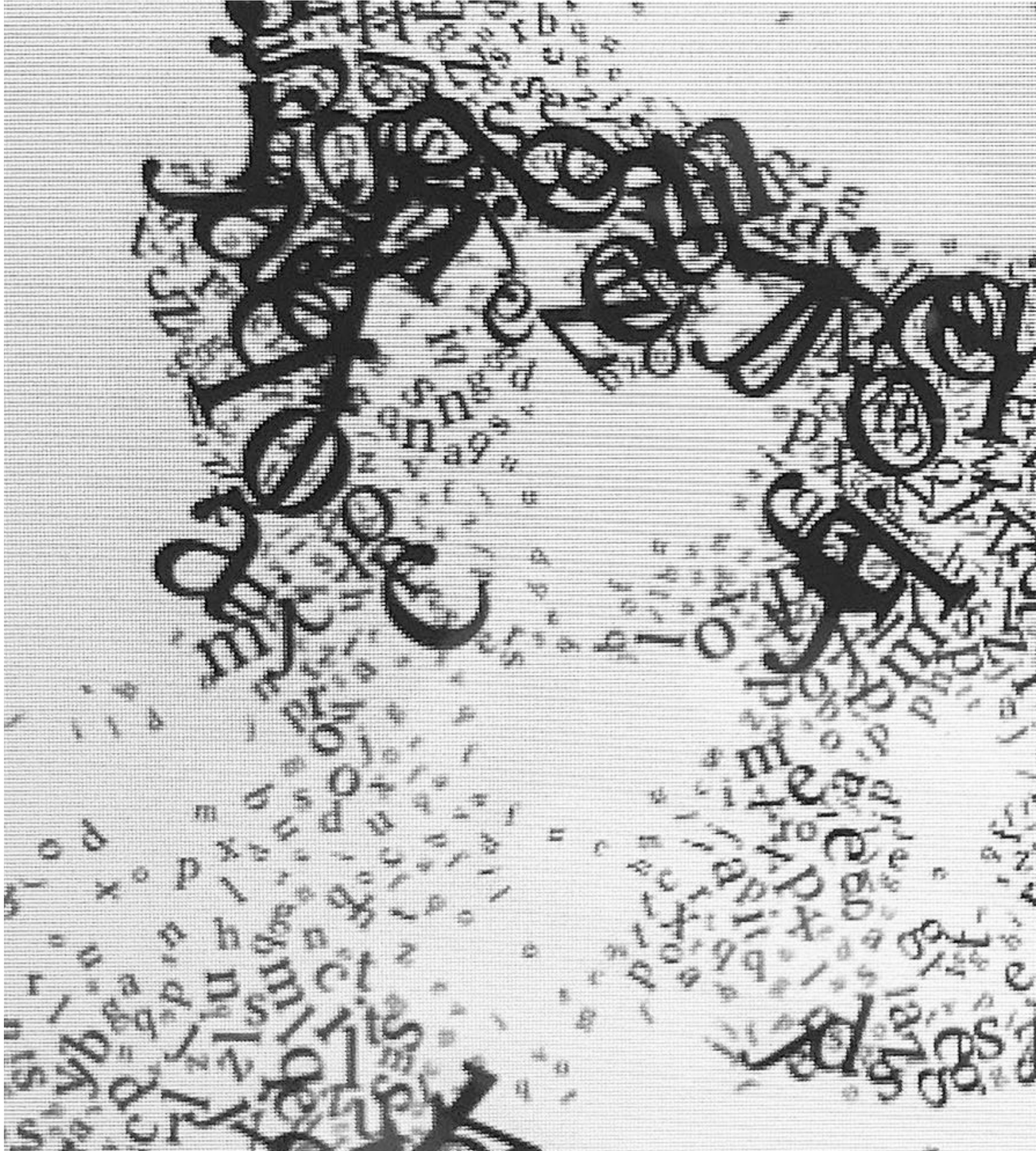
Photomaton.
Sérgio M. Rebelo, Tiago Martins, et al. (2020)

Magro, de olhos azuis, carão moreno, / Bem servido de pés, meão na altura, / Triste de facha, o mesmo de figura, / Nariz alto no meio, e não pequeno; // Incapaz de assistir num só terreno / Mais propenso ao furor do que à ternura, / Bebendo em níveas mãos por taça escura / De zelos infernais letal veneno;

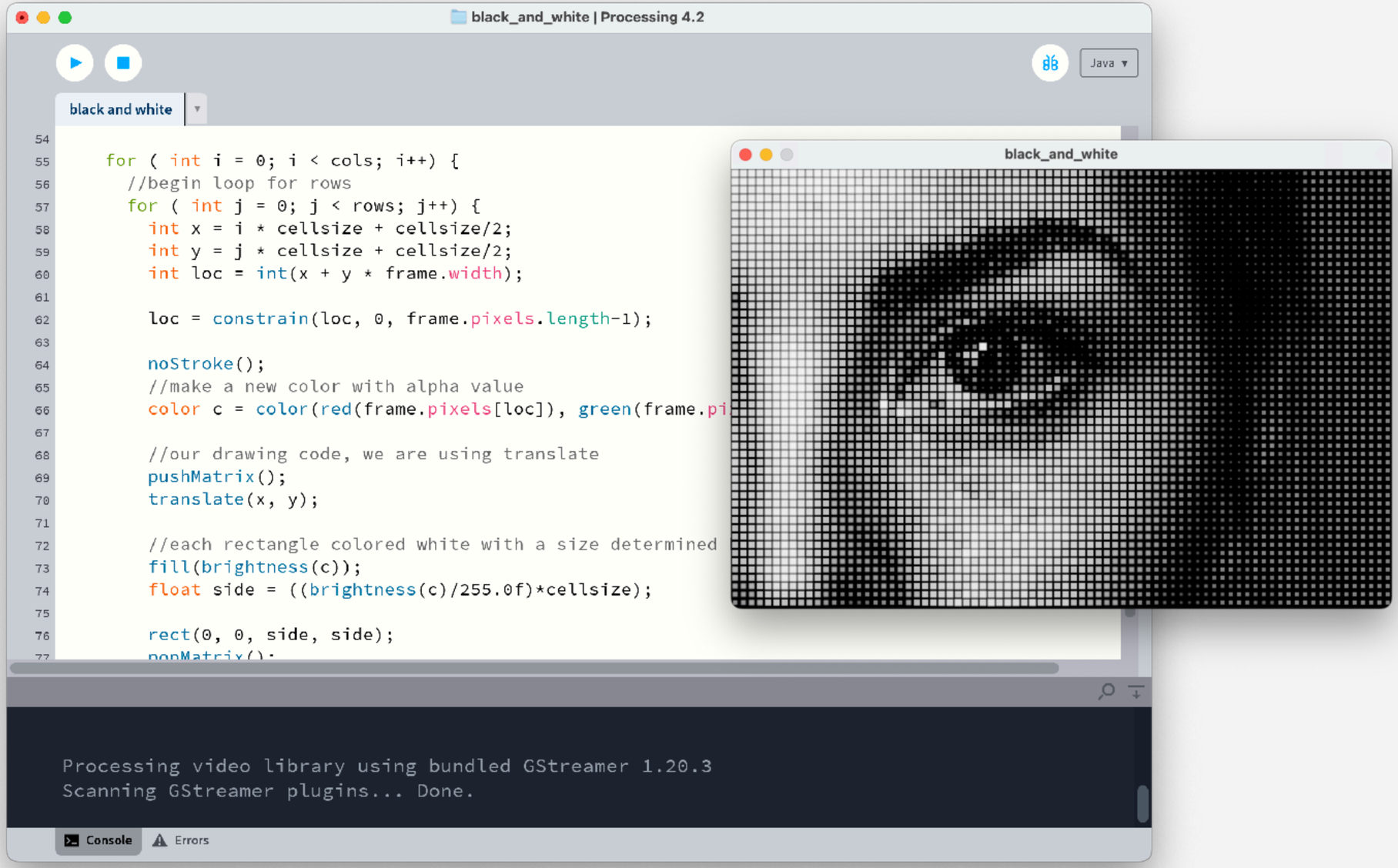
José maria nicolau fugiu. Quem o apanha? / Nunca ele pedalou tanto como agora / Decerto vai chegar antes da hora / A etapa era decisiva e está ganha // Ele que várias vezes deu a volta a portugal / deu desta vez a volta a quê? Talvez à vida

..... Só! / Ai do Lusíada, coitado, / Que vem de tão longe, coberto de pó. / Que não ama, nem é amado, / Lúgubre Outono, no mês de Abril! / Que triste foi o seu fado! / Antes fosse pra soldado, / Antes fosse pró Brasil...

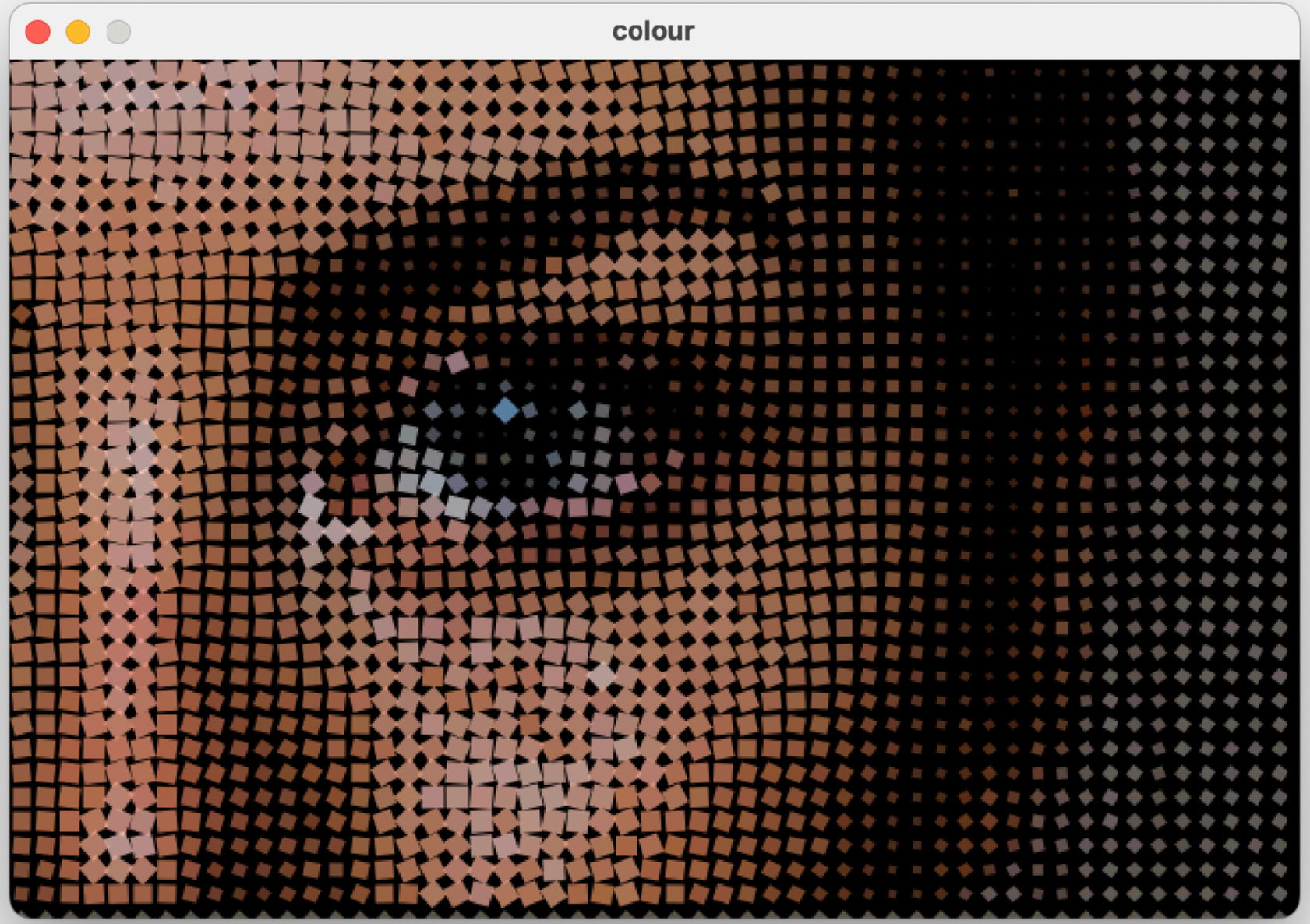
Não sei porquê, acordei com este poema na cabeça // Olha, Daisy: quando eu morrer tu hás de / dizer aos meus amigos aí de Londres, / embora não o sintas, que tu escondes / a grande dor da minha morte.




Repetir
Seguir



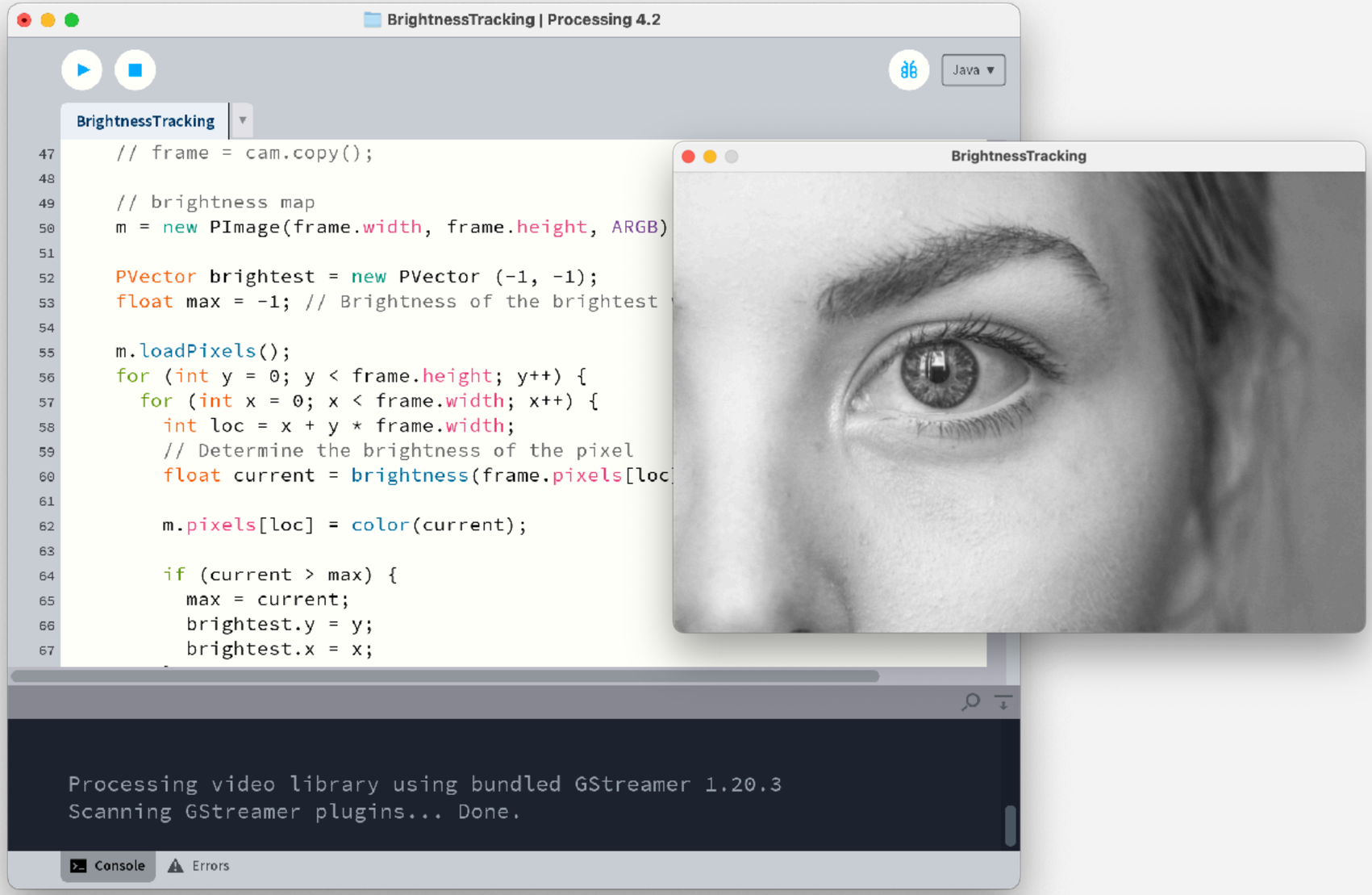
Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/1-Mirrors/BlackAndWhite



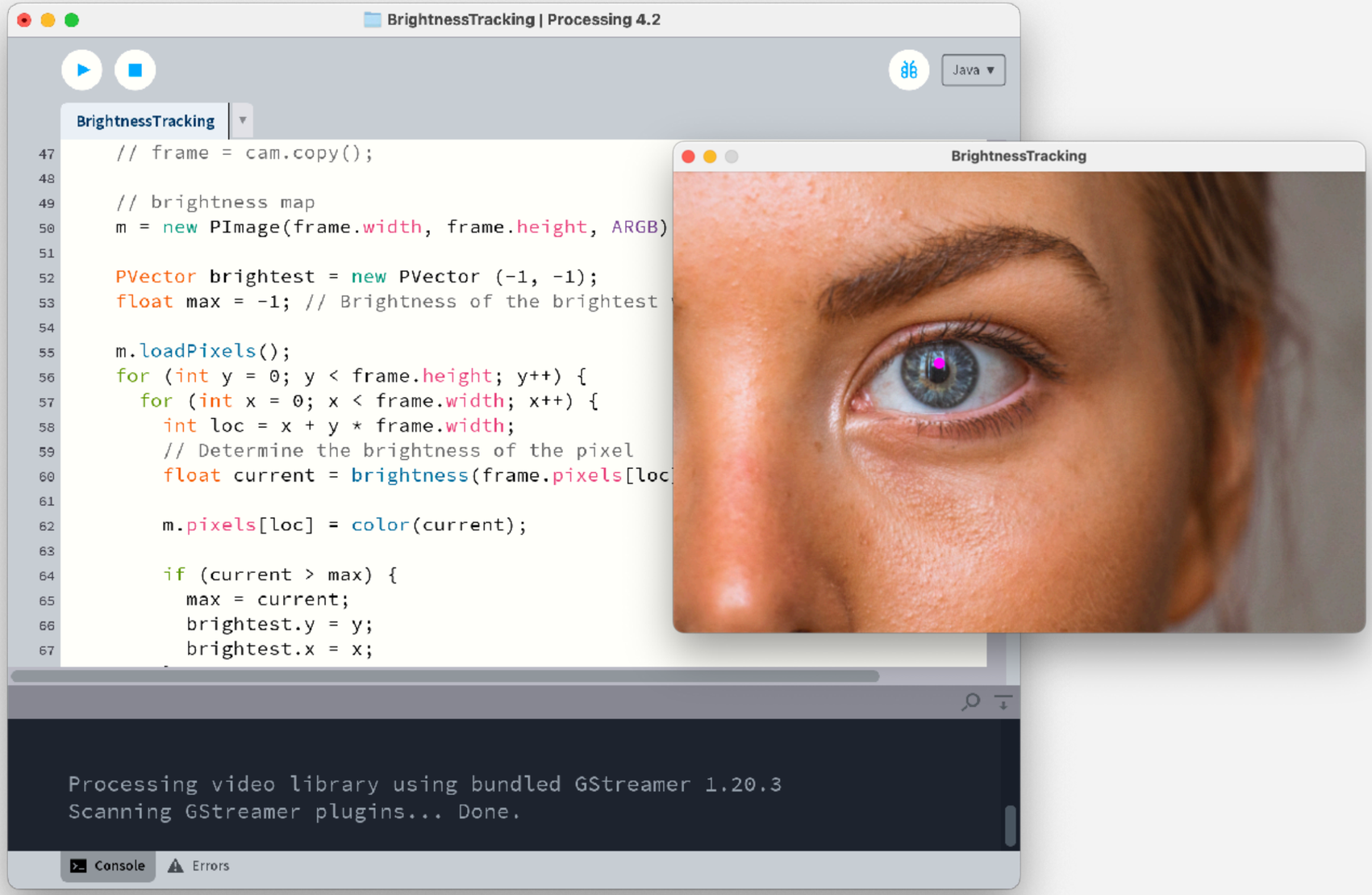
Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/1-Mirrors/Colour

Video Tracking

Brightness

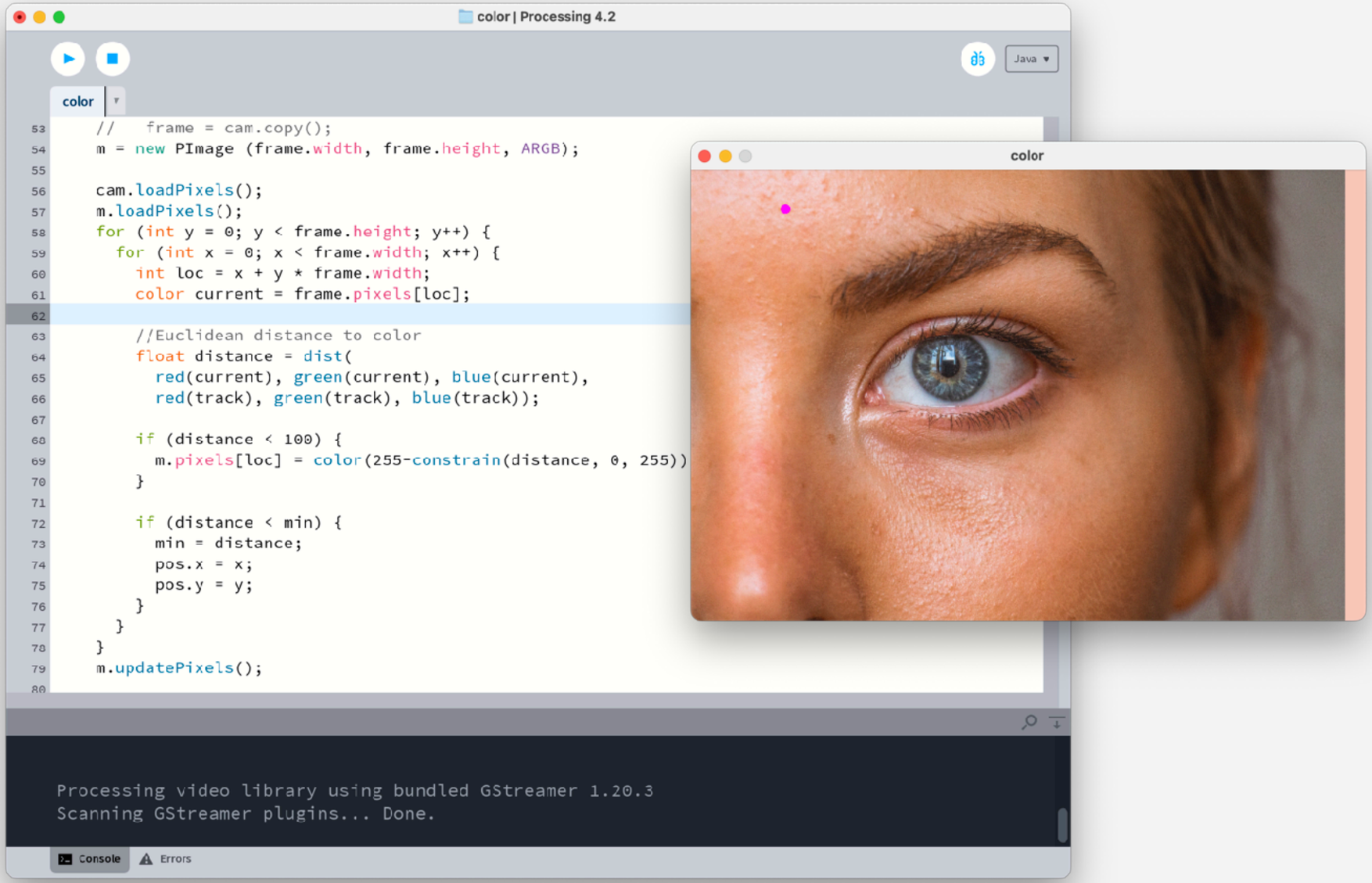


Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/2-Tracking/Brightness

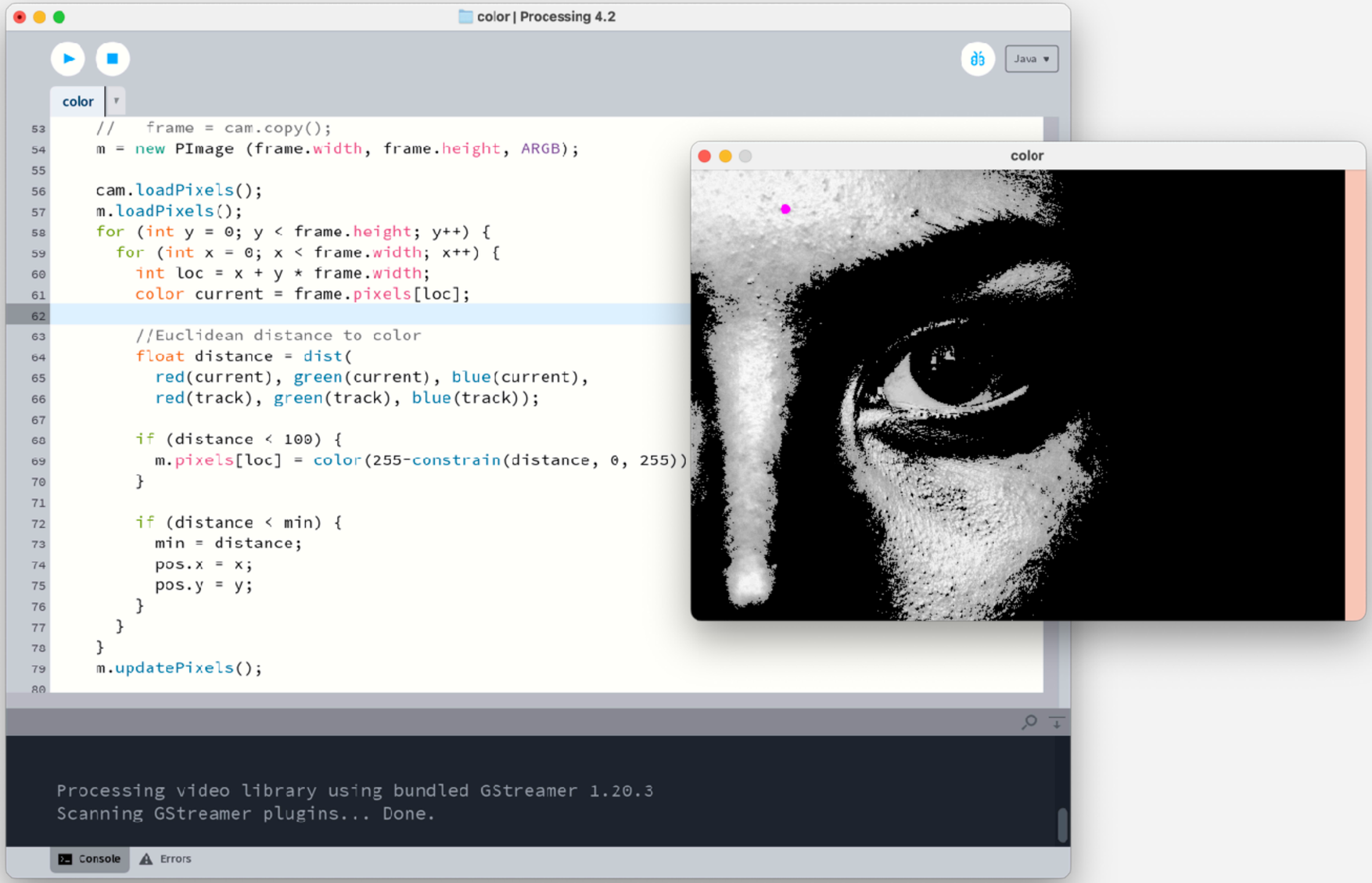


Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/2-Tracking/Brightness

Colour

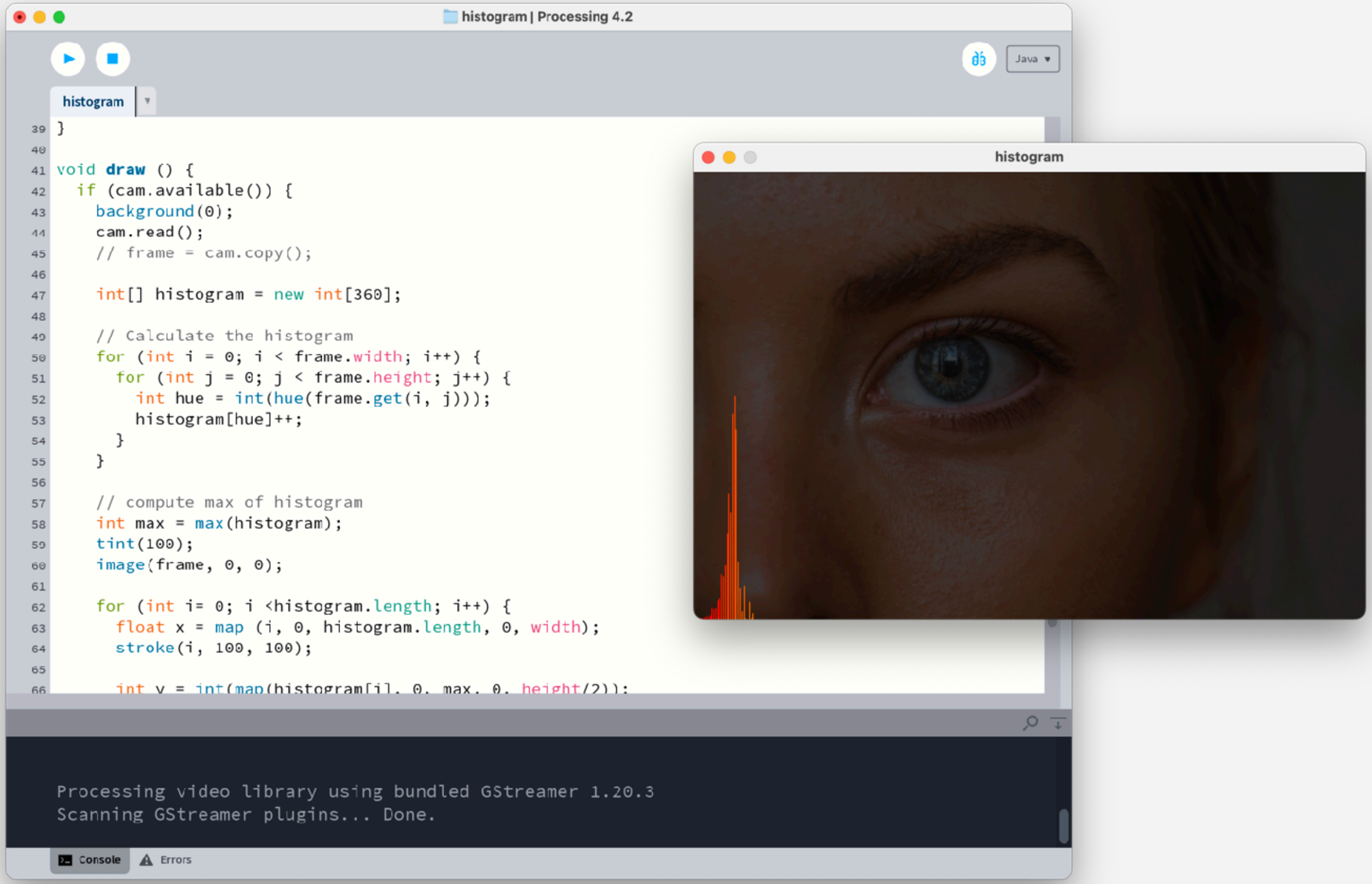


Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/2-Tracking/Color

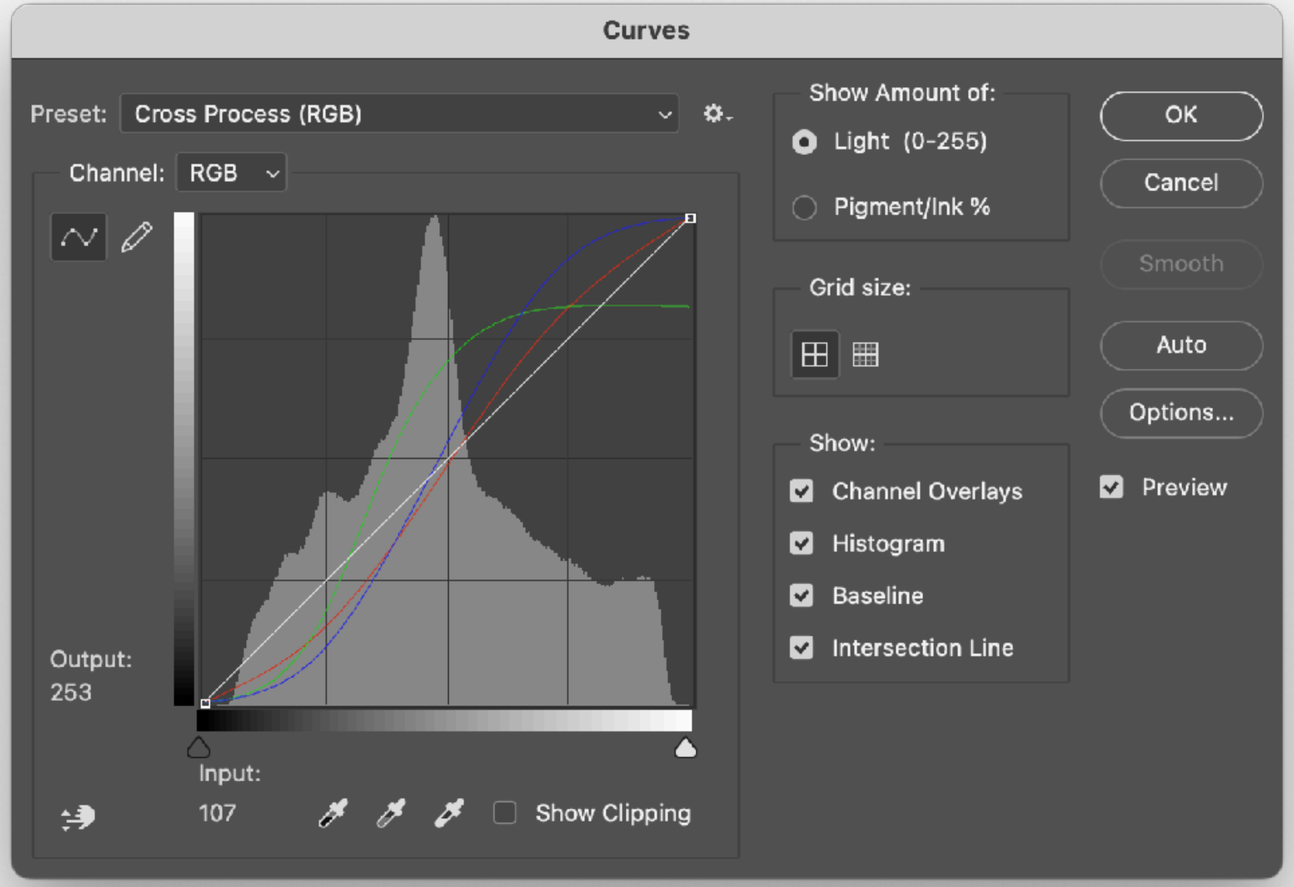


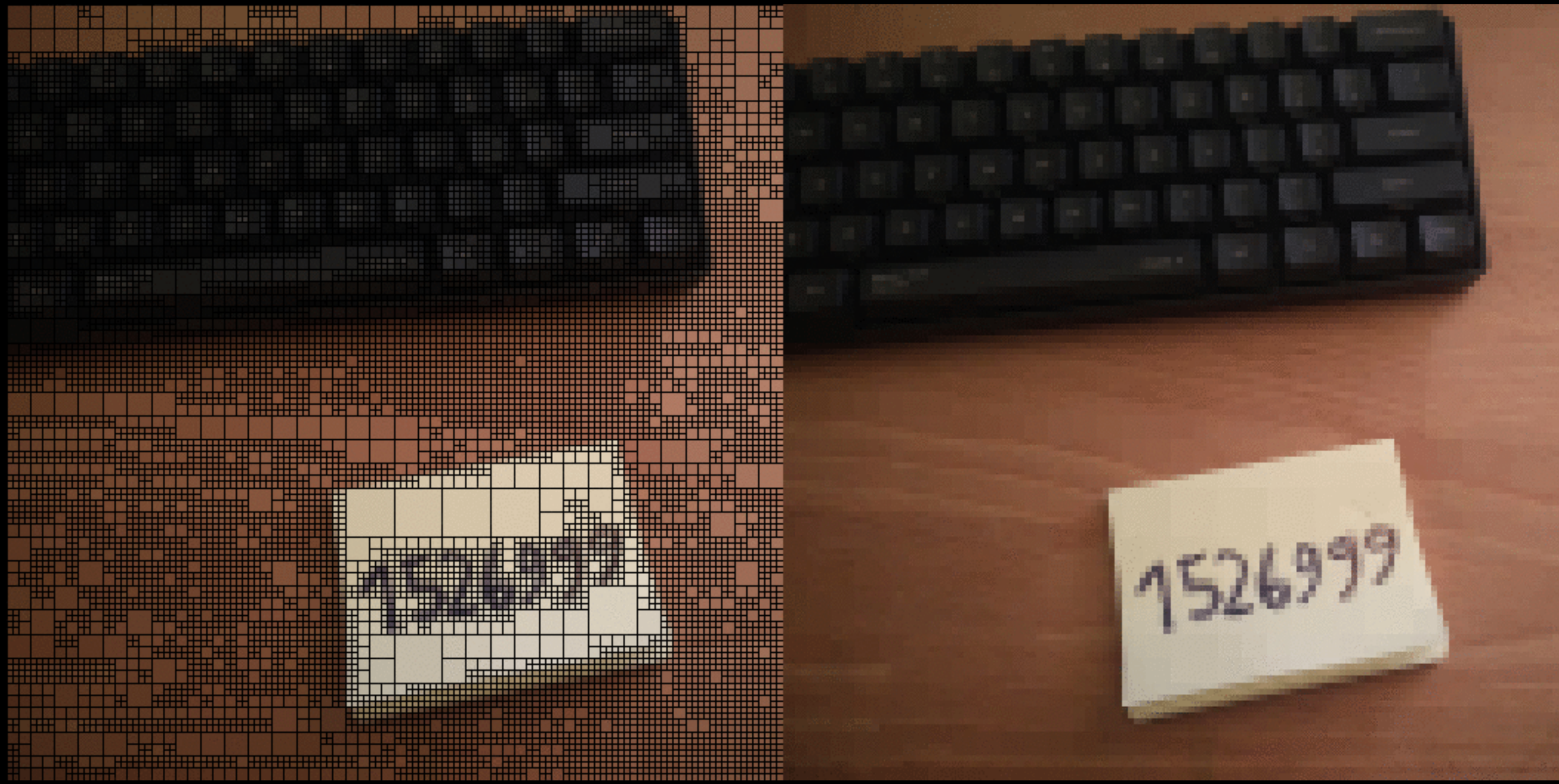
Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/2-Tracking/Color

Histogram



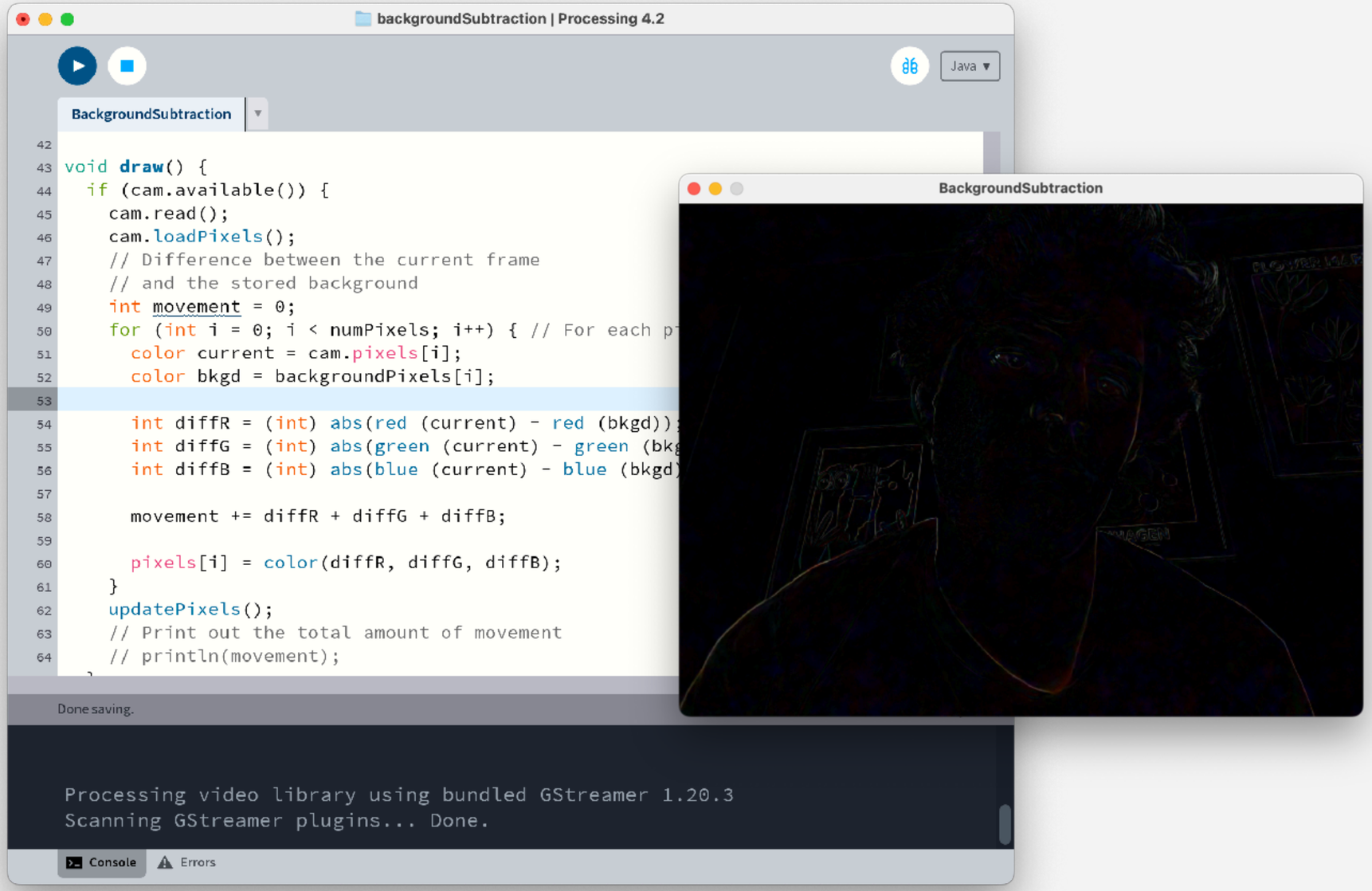
Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/2-Tracking/Histogram


Curves
Preset:
Cross Process (RGB)
Channel:
RGB
Output:
253
Input:
107
Show Clipping
Show Amount of:
Light (0-255)
Pigment/Ink %
Grid size:
Show:
Channel Overlays
Histogram
Baseline
Intersection Line
OK
Cancel
Smooth
Auto
Options...
Preview


1526999

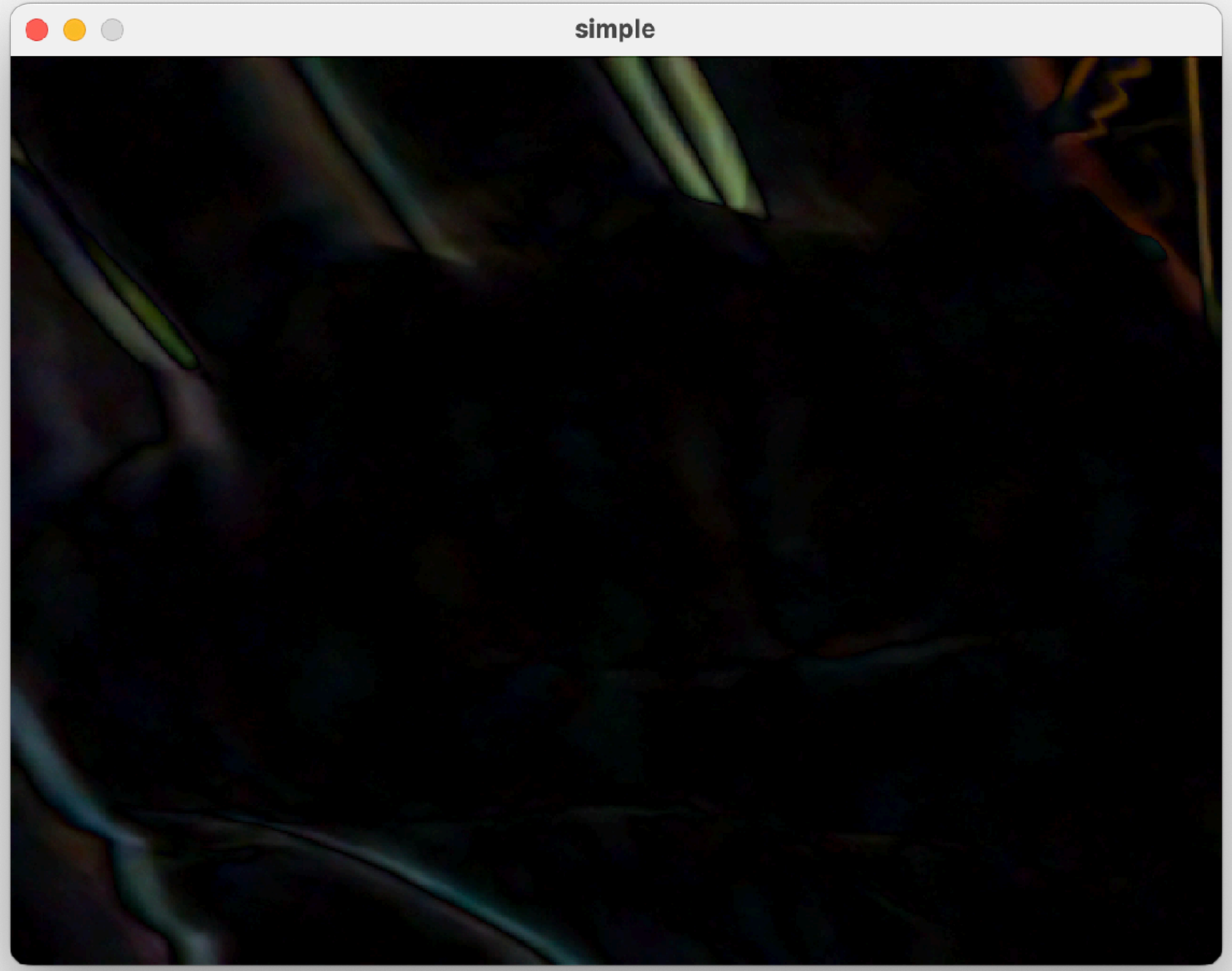
Video differencing algorithms

Background Subtraction

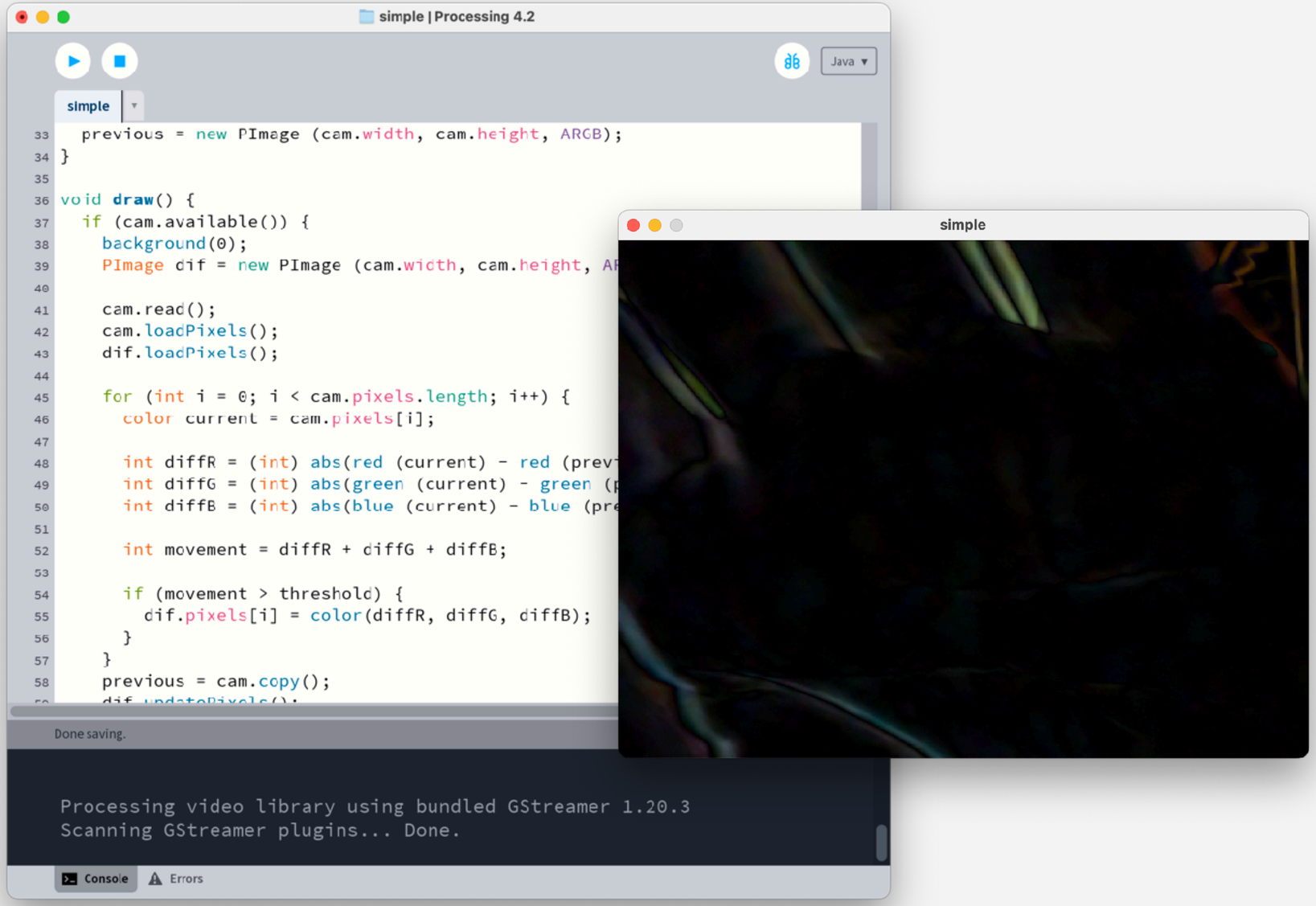


Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/3-Differencing/BackgroundSubtraction

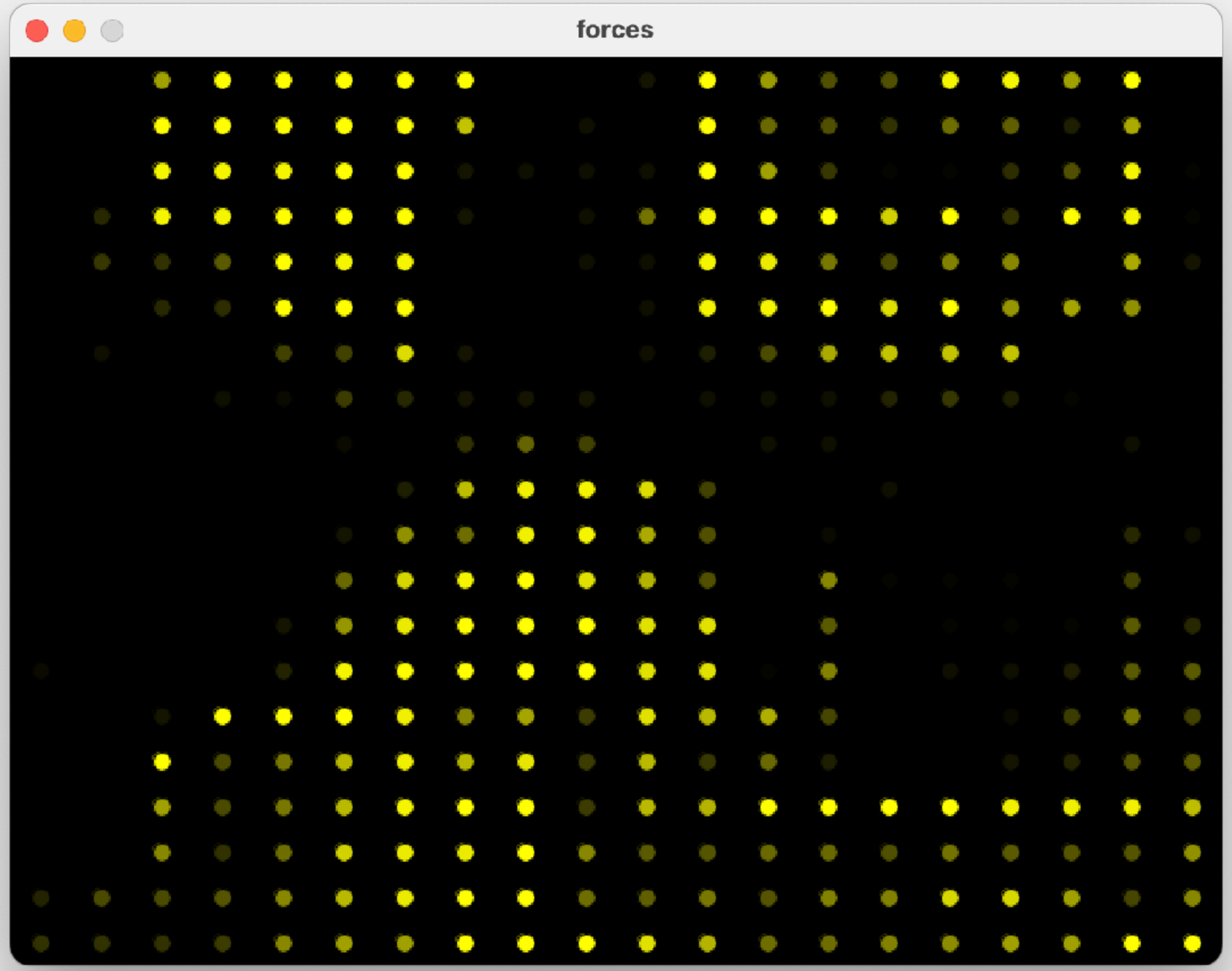
Frame differencing



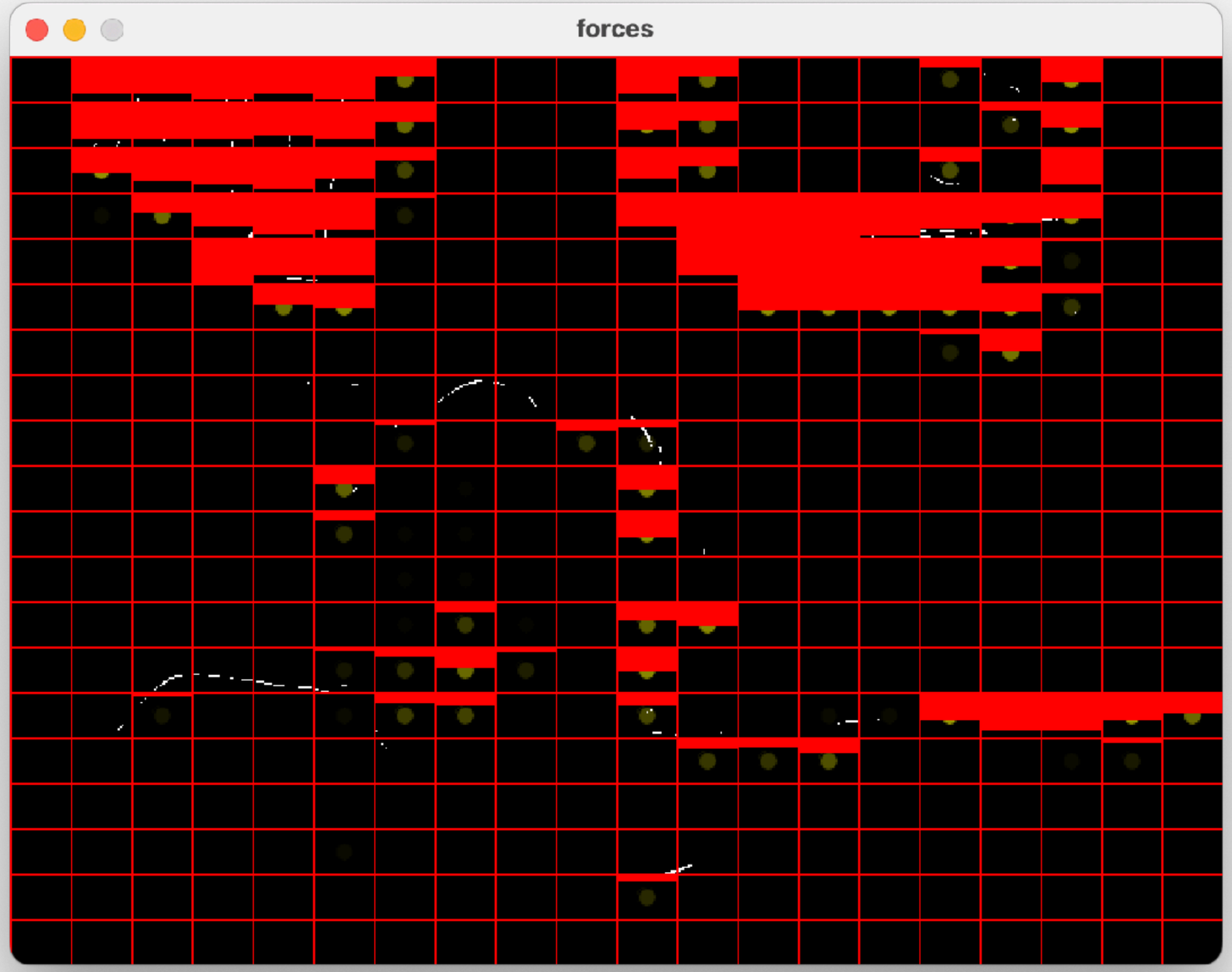
Frame differencing sketch



Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/3-Differencing/Frame%20Differencing/Simple



Code: https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/3-Differencing/Frame%20Differencing/Forces

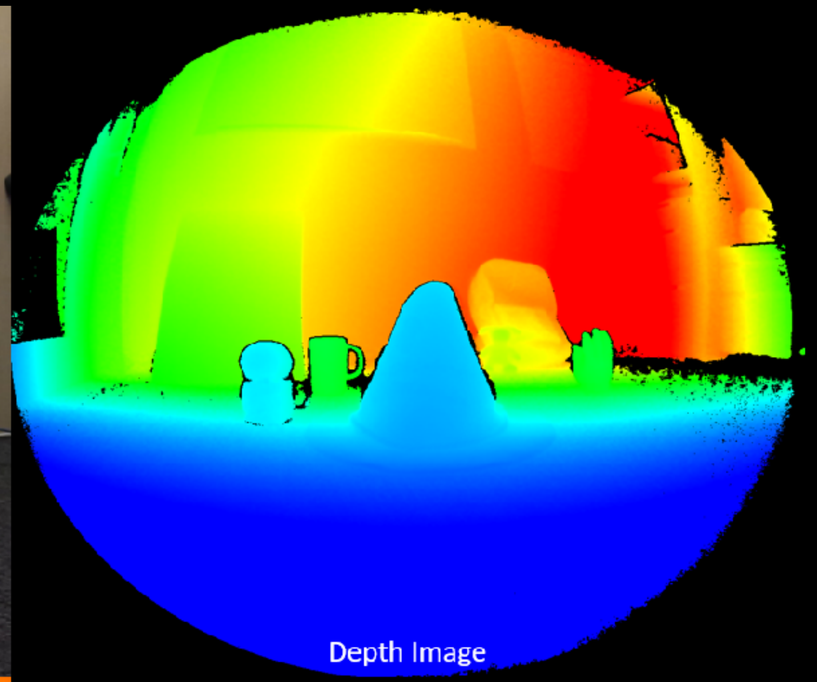

forces

motion sensing devices

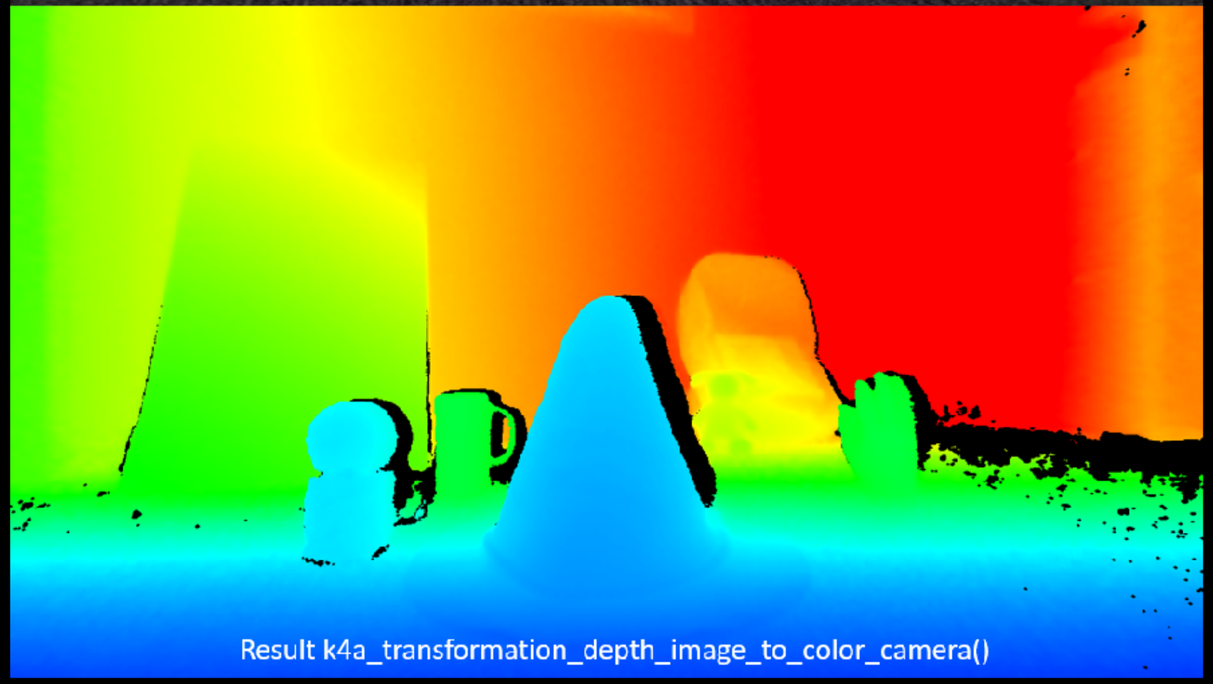
Kinect 2 for Xbox 360 (2014)

Azure Kinect DK (2020)

Color Image

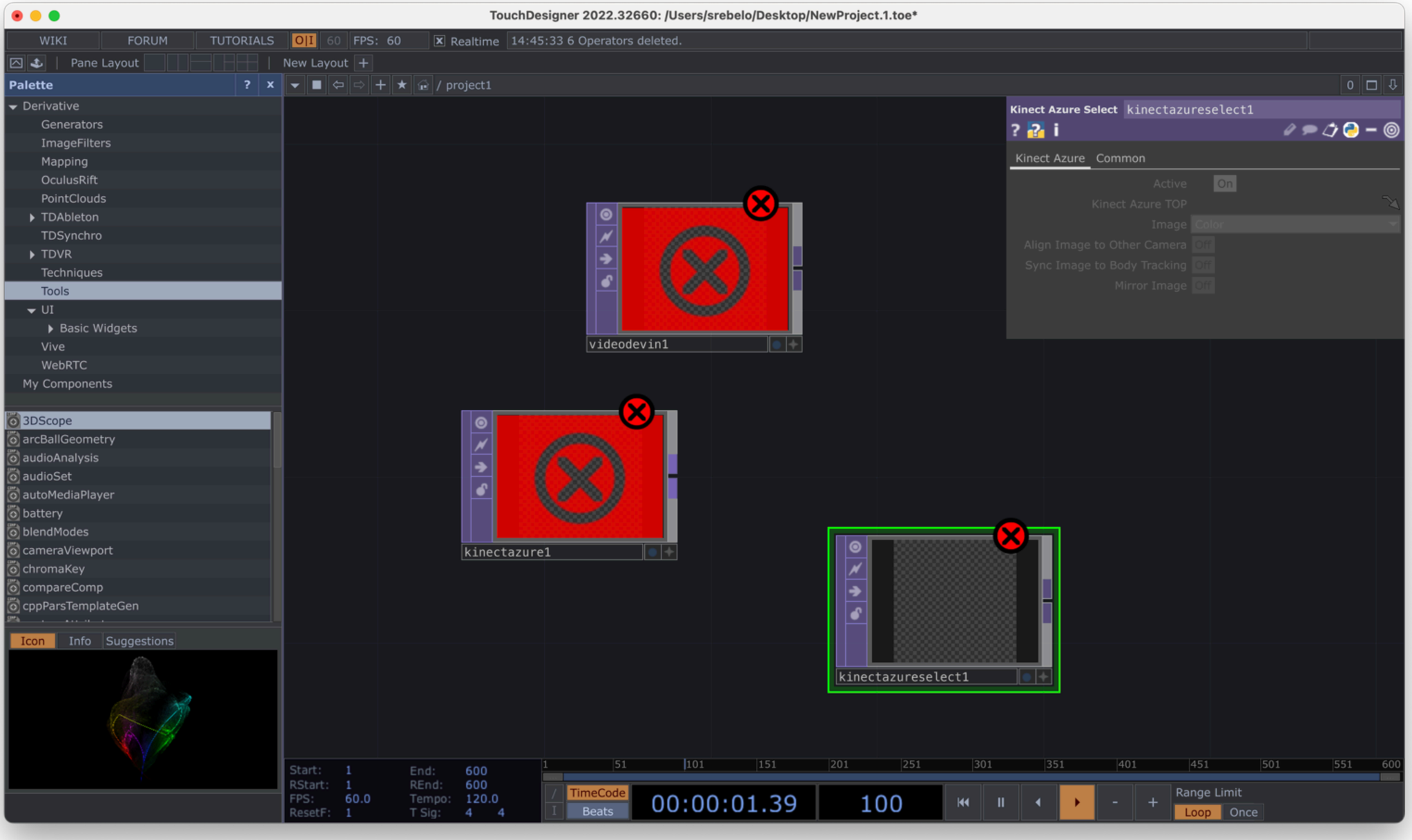


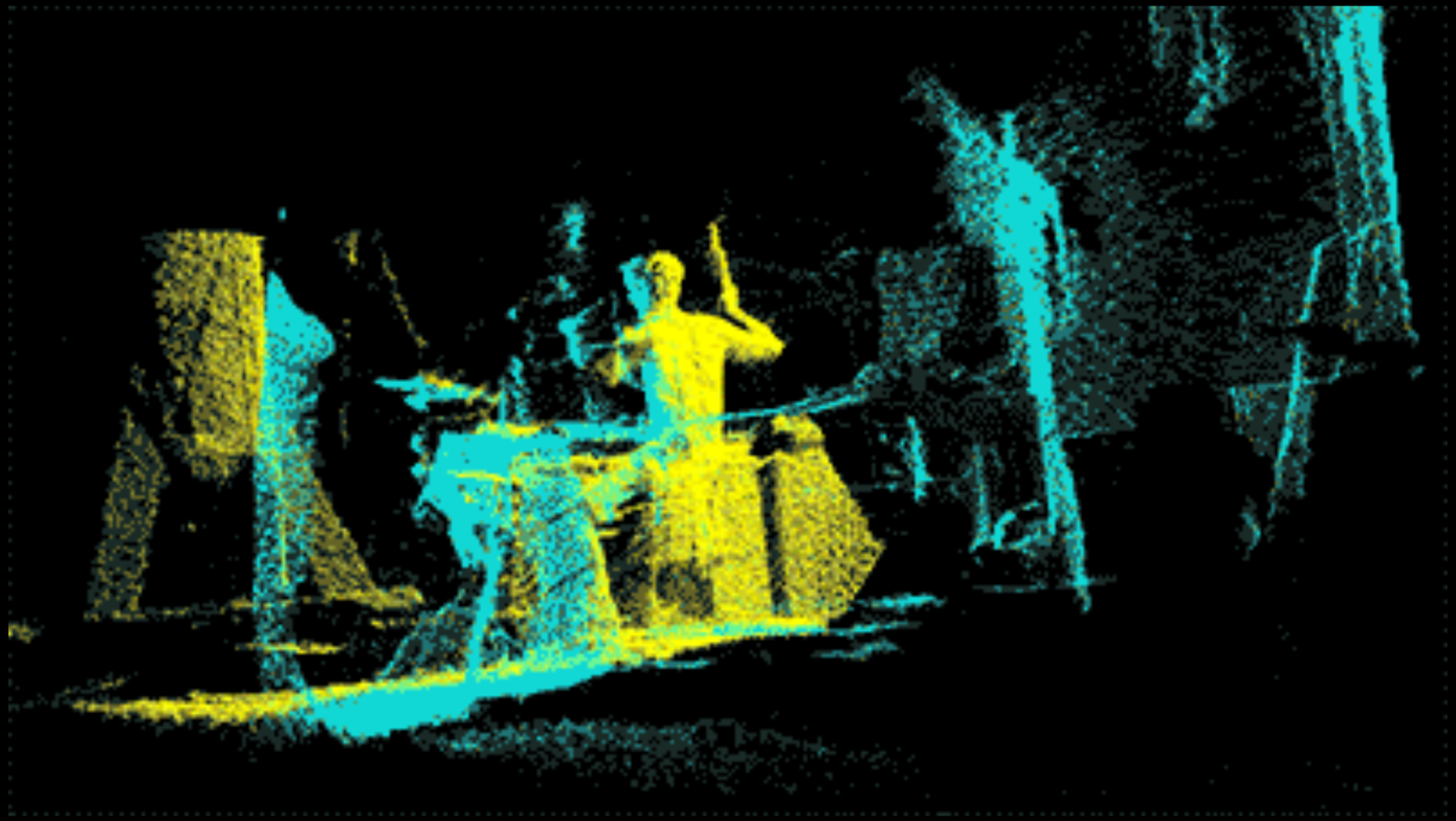
Depth Image

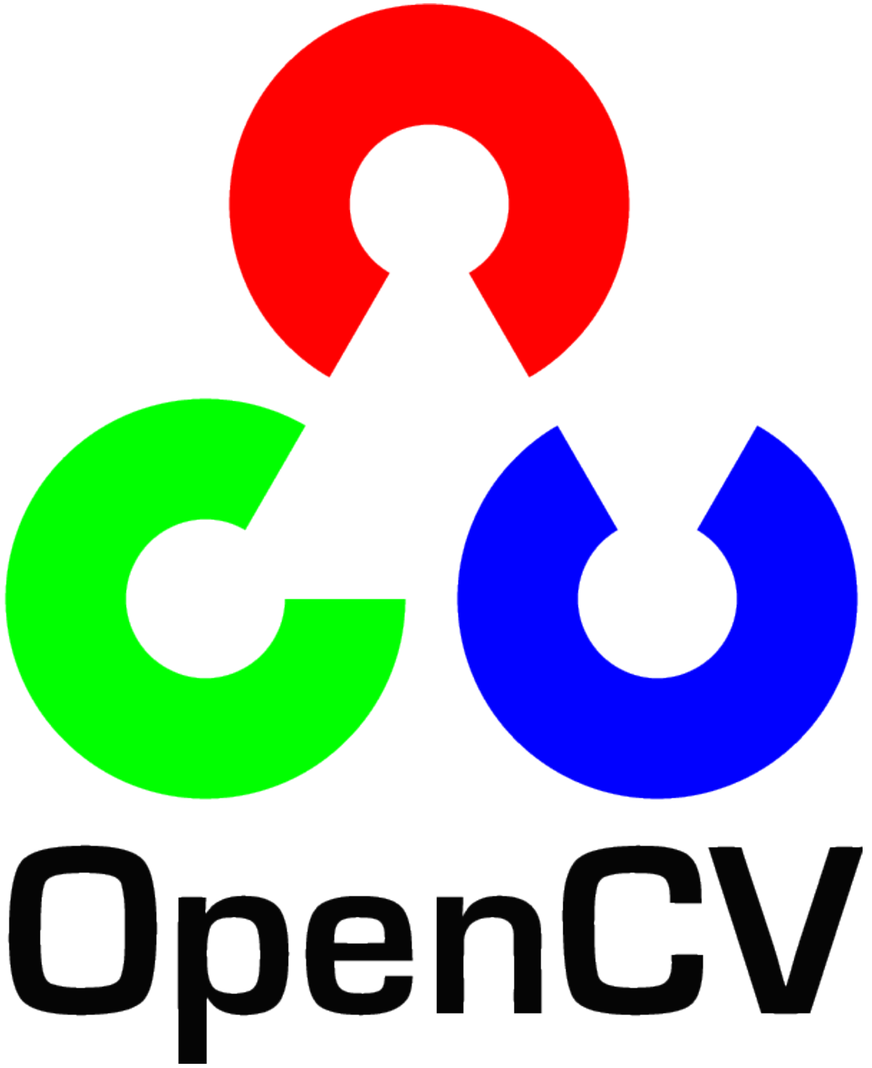


Result k4a_transformation_depth_image_to_color_camera()

Result k4a_transformation_color_image_to_depth_camera()


TouchDesigner 2022.32660: /Users/srebelo/Desktop/NewProject.1.toe*
WIKI
FORUM
TUTORIALS
FPS: 60
Realtime
14:45:33 6 Operators deleted.
Pane Layout
New Layout
Palette
Derivative
Generators
ImageFilters
Mapping
OculusRift
PointClouds
TDAbleton
TDSynchro
TDVR
Techniques
Tools
UI
Basic Widgets
Vive
WebRTC
My Components
3DScope
arcBallGeometry
audioAnalysis
audioSet
autoMediaPlayer
battery
blendModes
cameraViewport
chromaKey
compareComp
cppParsTemplateGen
Icon
Info
Suggestions
/ project1
videodevin1
kinectazure1
kinectazureselect1
Kinect Azure Select
kinectazureselect1
Kinect Azure
Common
Active
On
Kinect Azure TOP
Image
Color
Align Image to Other Camera
Off
Sync Image to Body Tracking
Off
Mirror Image
Off
Start: 1
RStart: 1
FPS: 60.0
ResetF: 1
End: 600
REnd: 600
Tempo: 120.0
T Sig: 4 4
TimeCode
Beats
00:00:01.39
100
Range Limit
Loop
Once





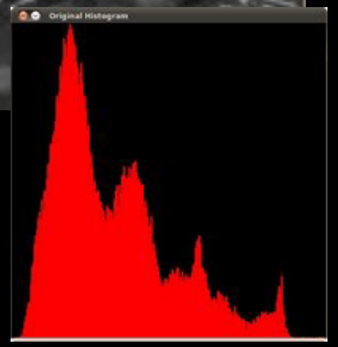
https://github.com/opencv/opencv

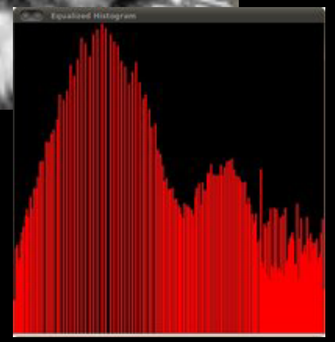
Original image

Erosion

Dilation

Image processing filters



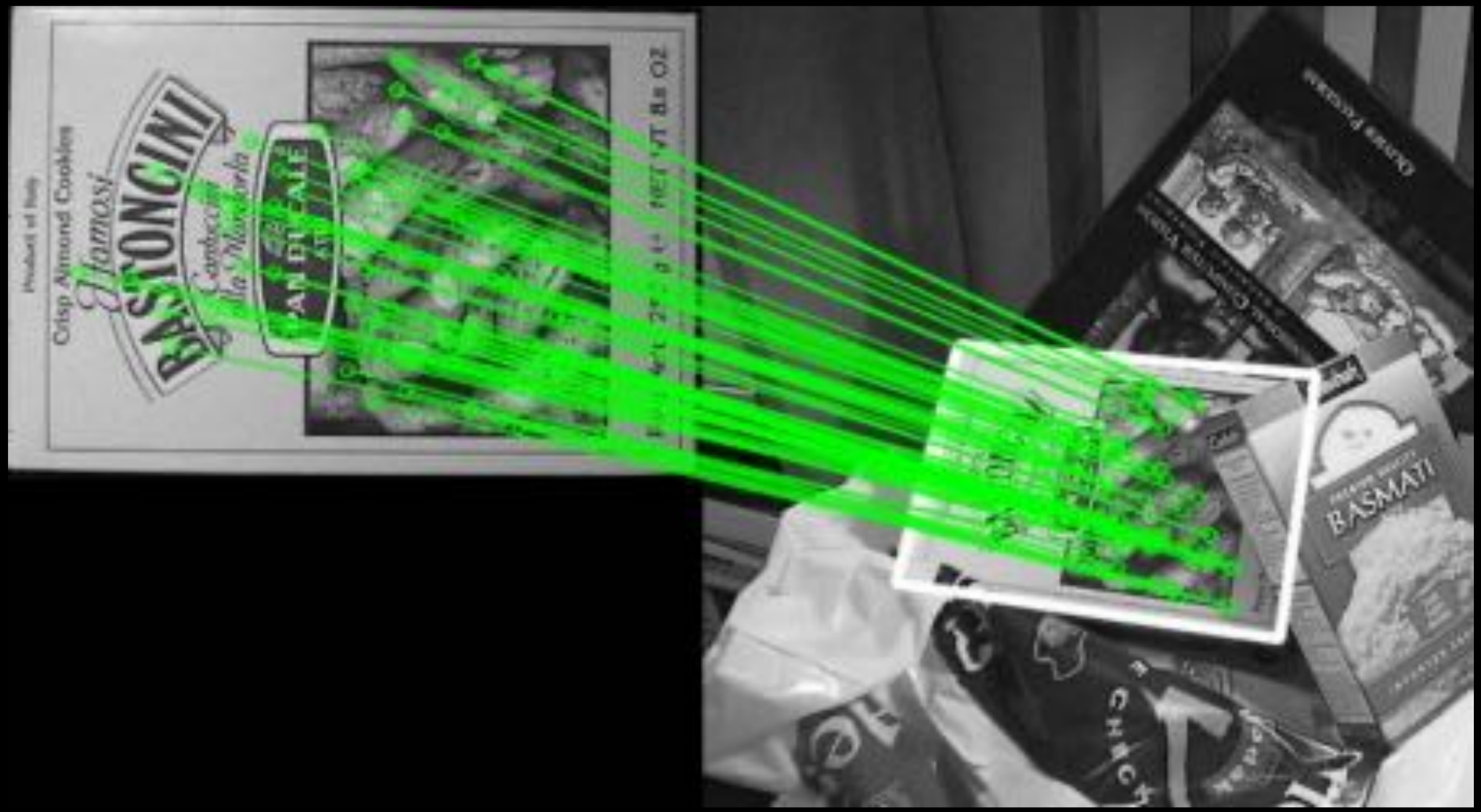


Color processing

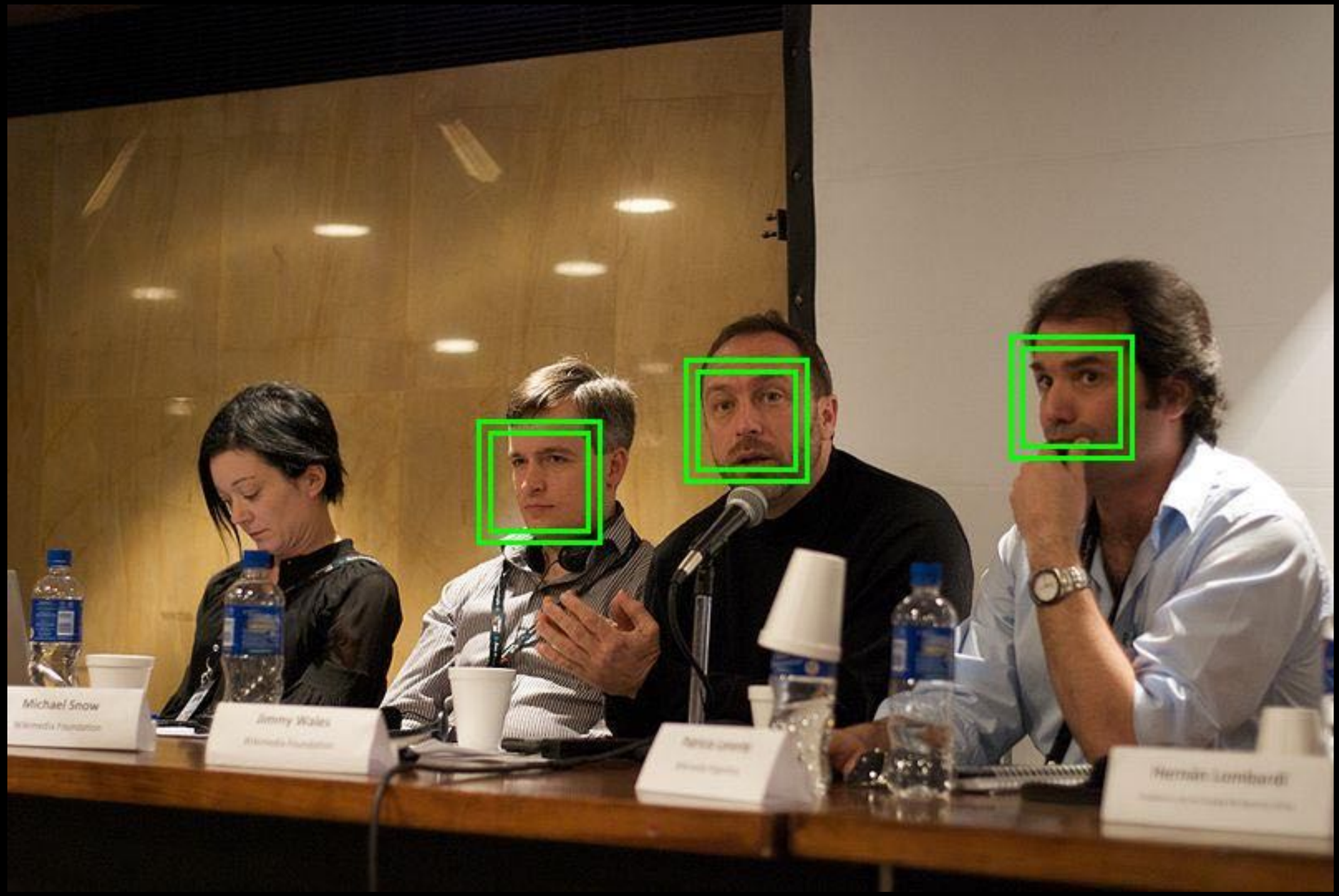
Original image

Canny Edge Image

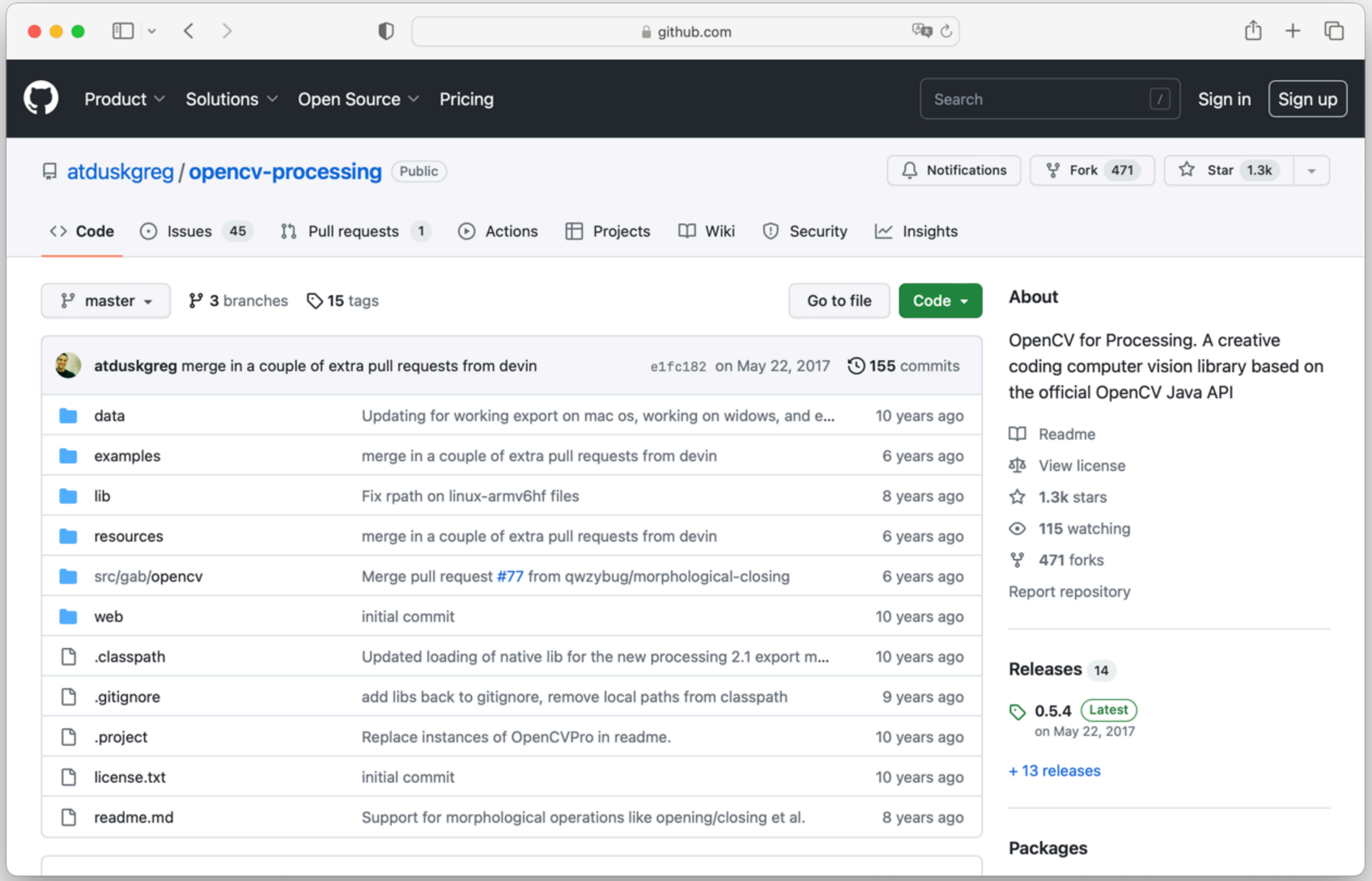
Edge detection filters



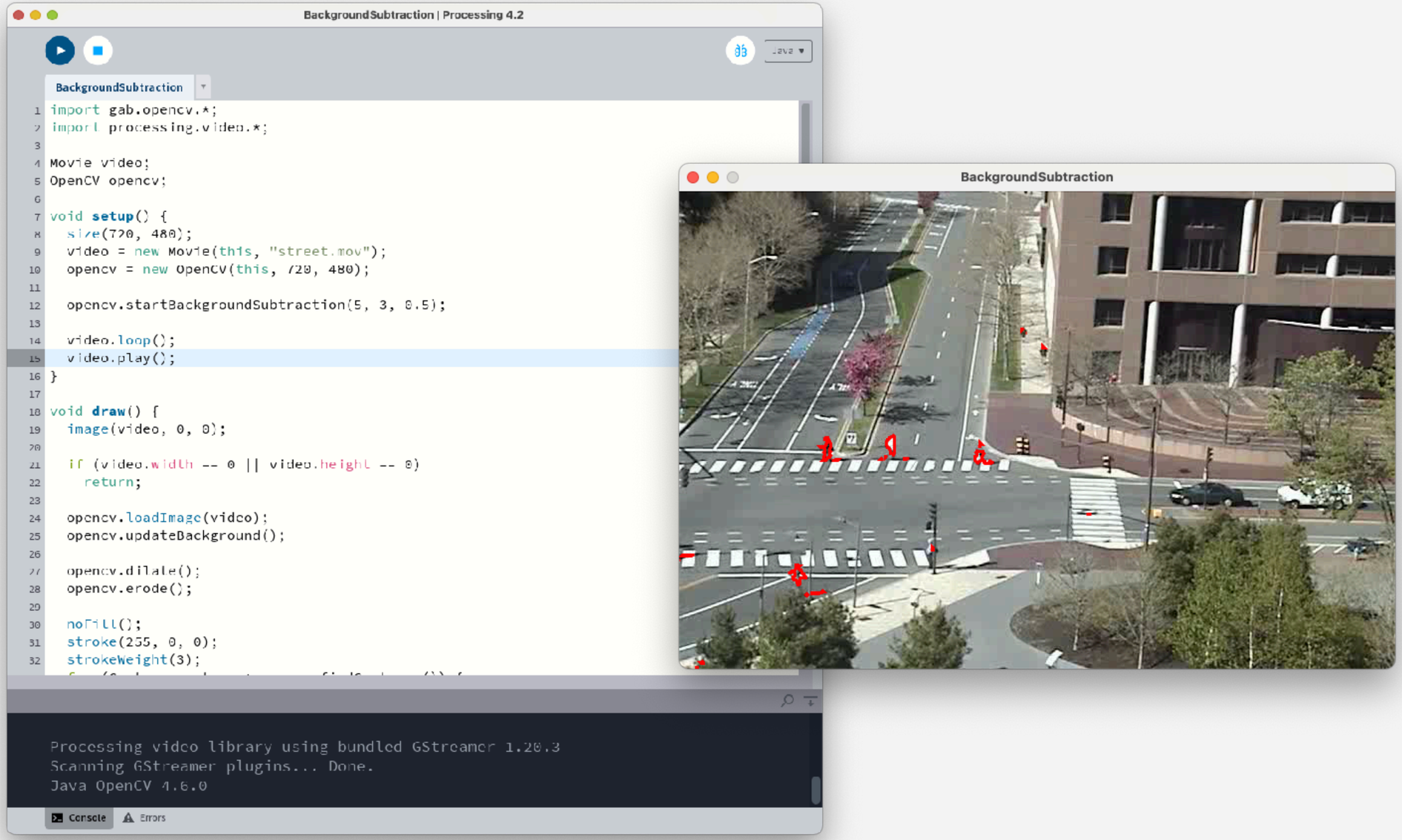
Feature-extraction for homography

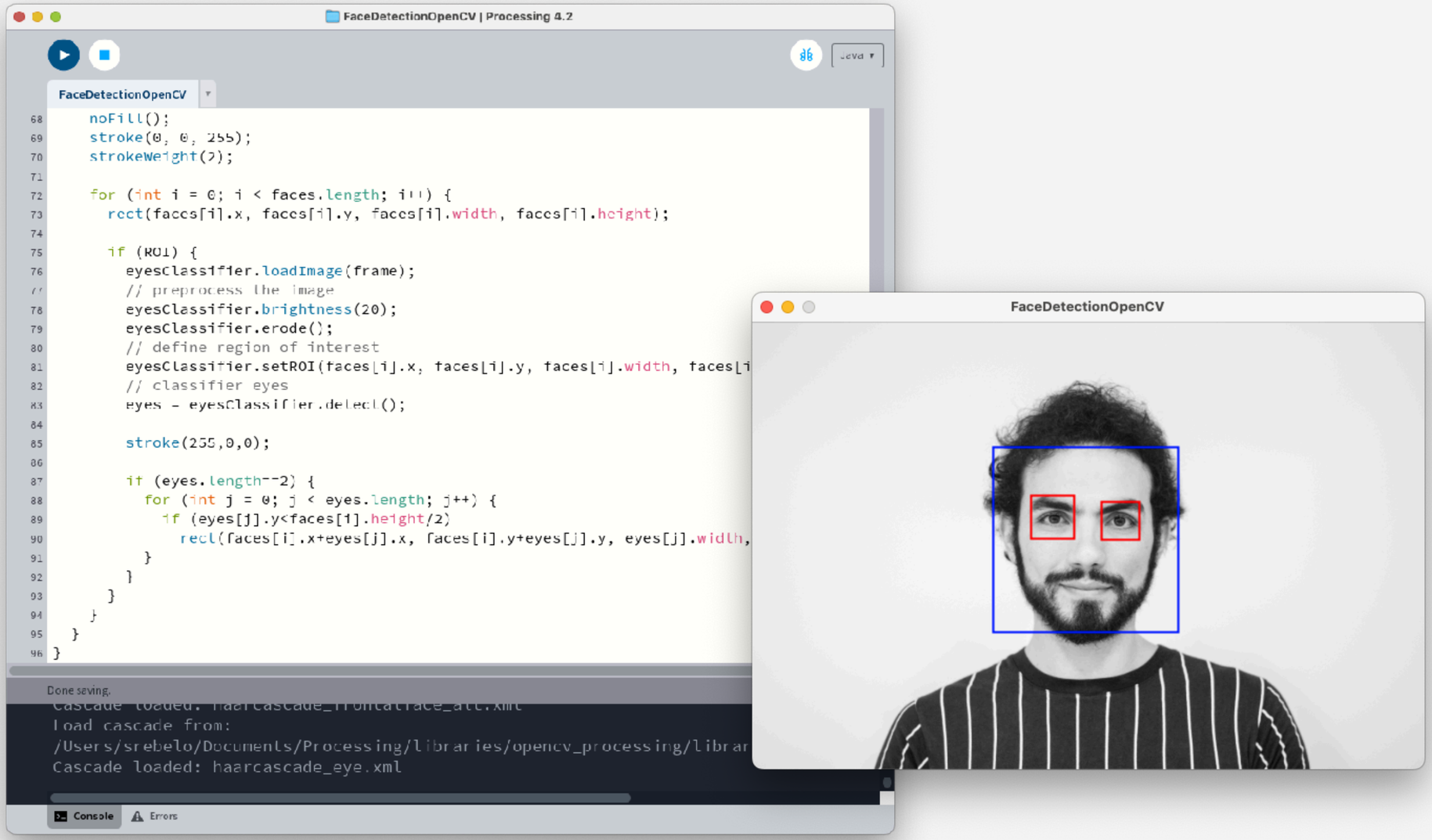


Pattern matching with machine-learning, using cascading algorithms.



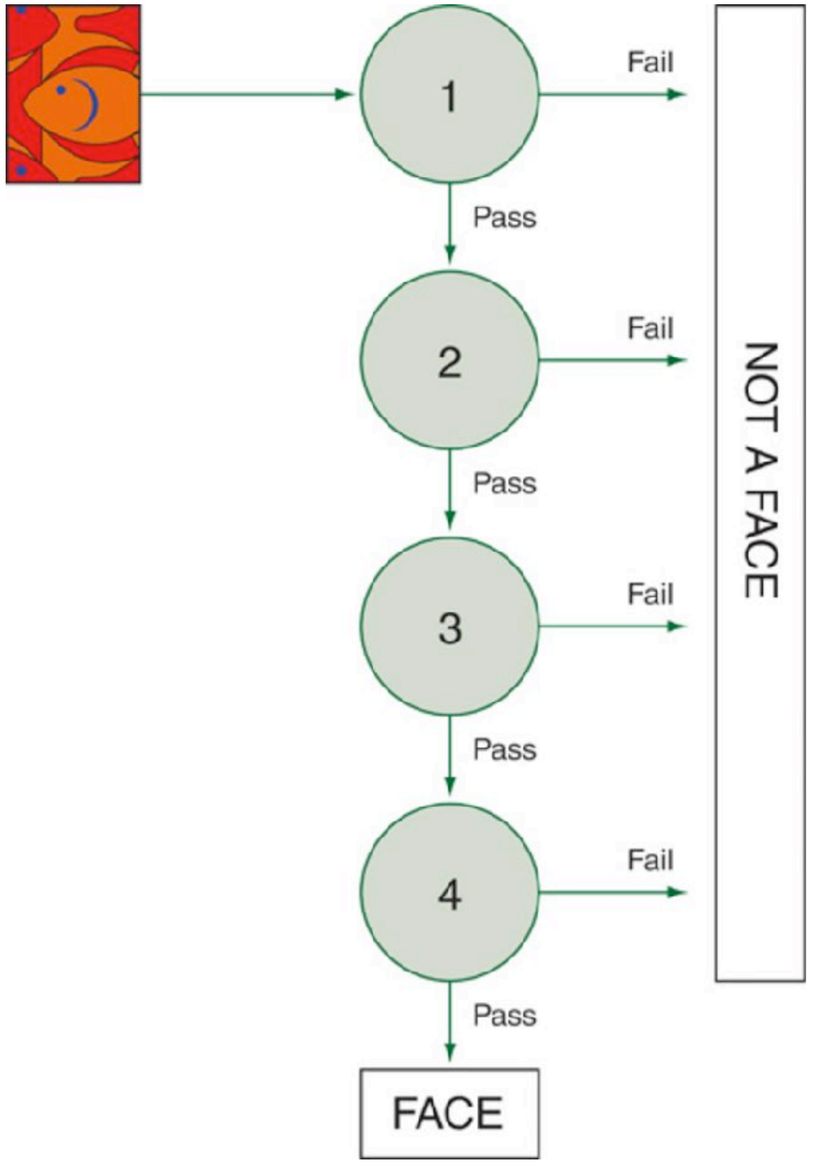
https://github.com/atduskgreg/opencv-processing


BackgroundSubtraction | Processing 4.2
BackgroundSubtraction
import gab.opencv.*;
import processing.video.*;
Movie video;
OpenCV opencv;
void setup() {
size(720, 480);
video = new Movie(this, "street.mov");
opencv = new OpenCV(this, 720, 480);
opencv.startBackgroundSubtraction(5, 3, 0.5);
video.loop();
video.play();
}
void draw() {
image(video, 0, 0);
if (video.width == 0 || video.height == 0)
return;
opencv.loadImage(video);
opencv.updateBackground();
opencv.dilate();
opencv.erode();
noFill();
stroke(255, 0, 0);
strokeWeight(3);
Processing video library using bundled GStreamer 1.20.3
Scanning GStreamer plugins... Done.
Java OpenCV 4.6.0
Console
Errors
BackgroundSubtraction

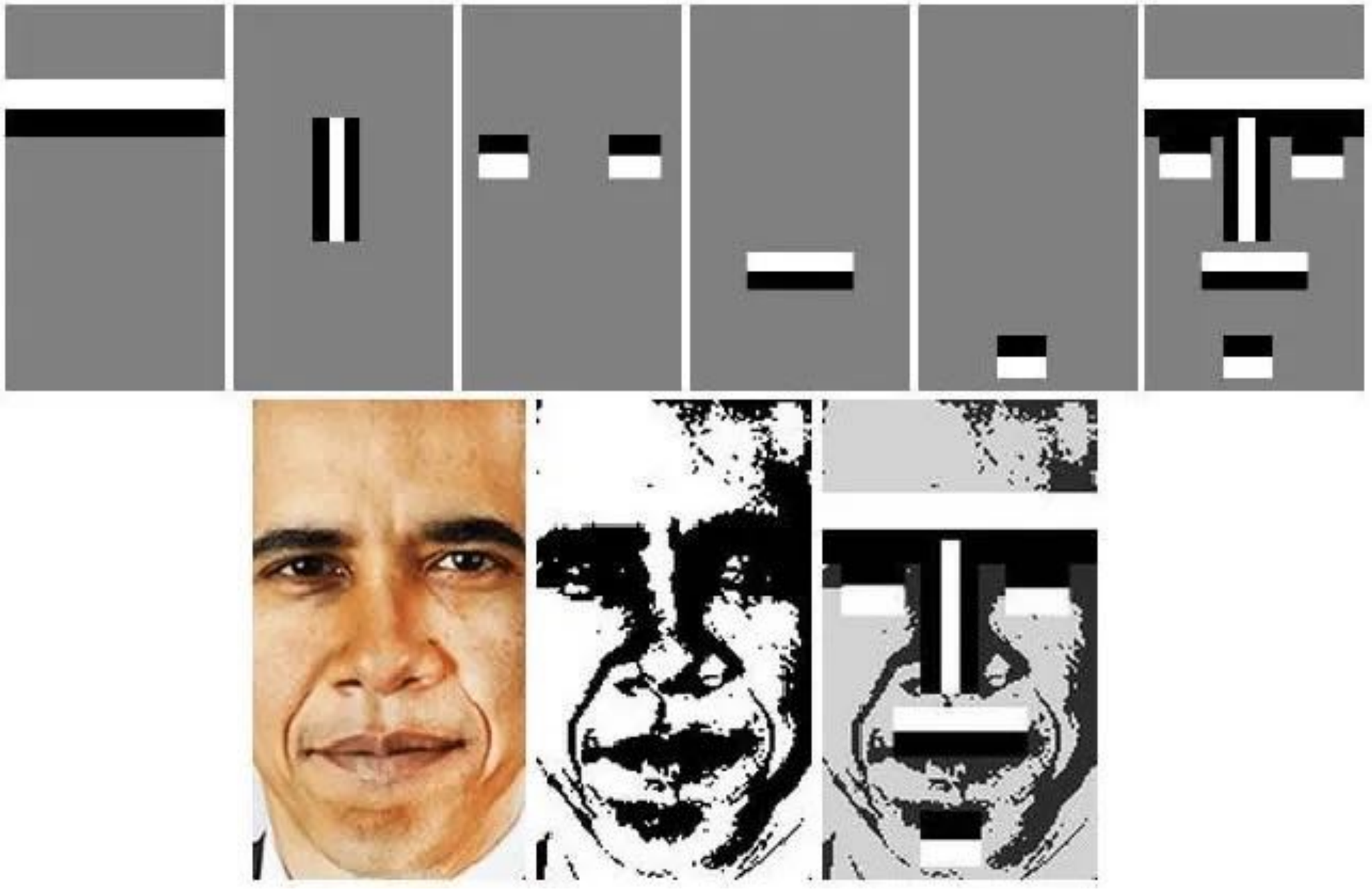


Face Detection

https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/4-FaceDetection/FaceDetectionOpenCV



Viola-jones Detector



A comparative study between LBP and Haar-like features for Face Detection using OpenCV. K. Kadir et al. (2014)

Contour Tracing Algorithms

https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/5-FindContours

README.md

Deep Vision Processing

Build passing

Deep computer-vision algorithms for Processing.

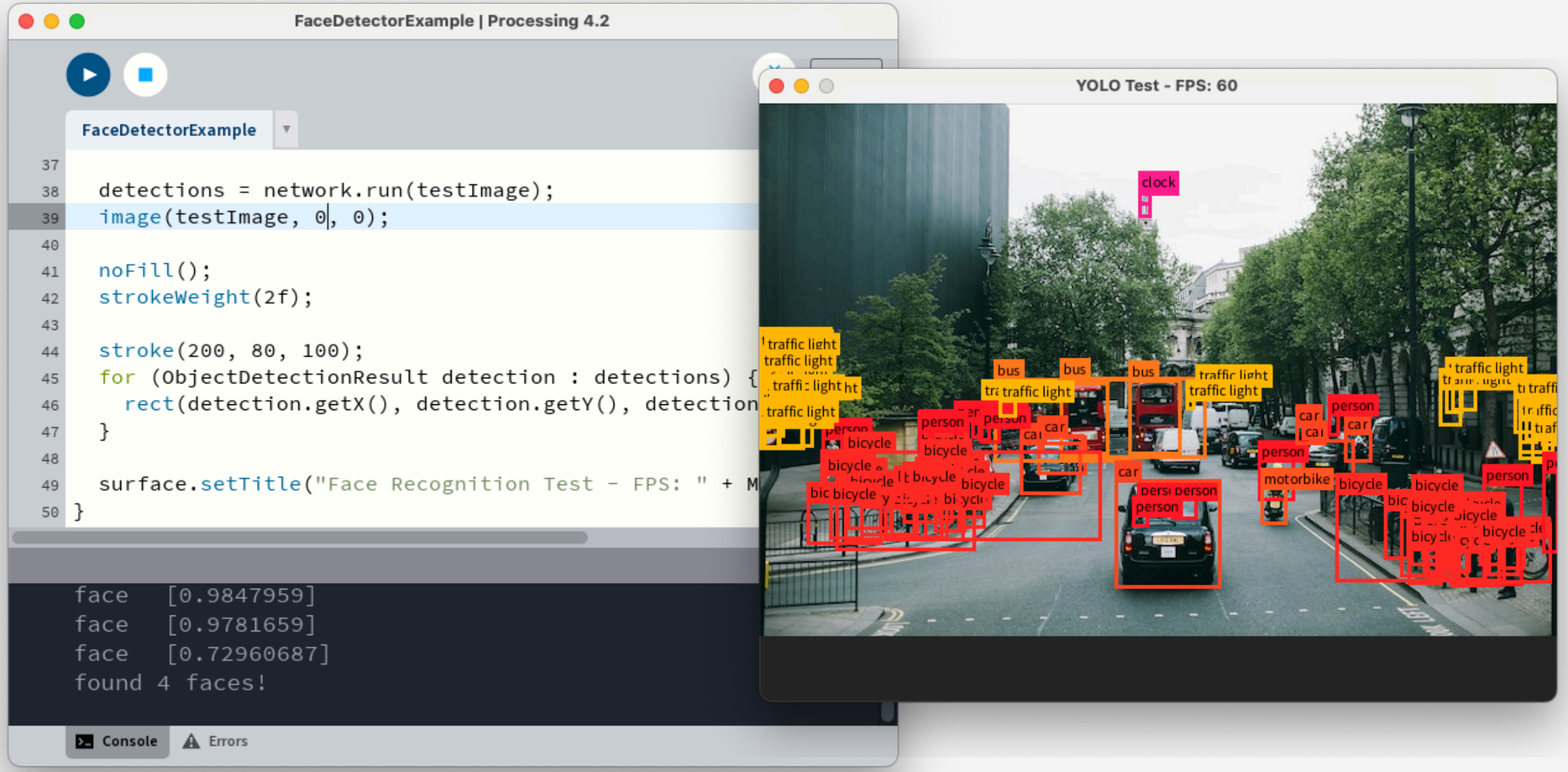
The idea behind this library is to provide a simple way to use (inference) machine learning algorithms for computer vision tasks inside Processing. Mainly portability and easy-to-use are the primary goals of this library. Starting with version `0.6.0` CUDA inferencing support is built into the library (Windows & Linux).

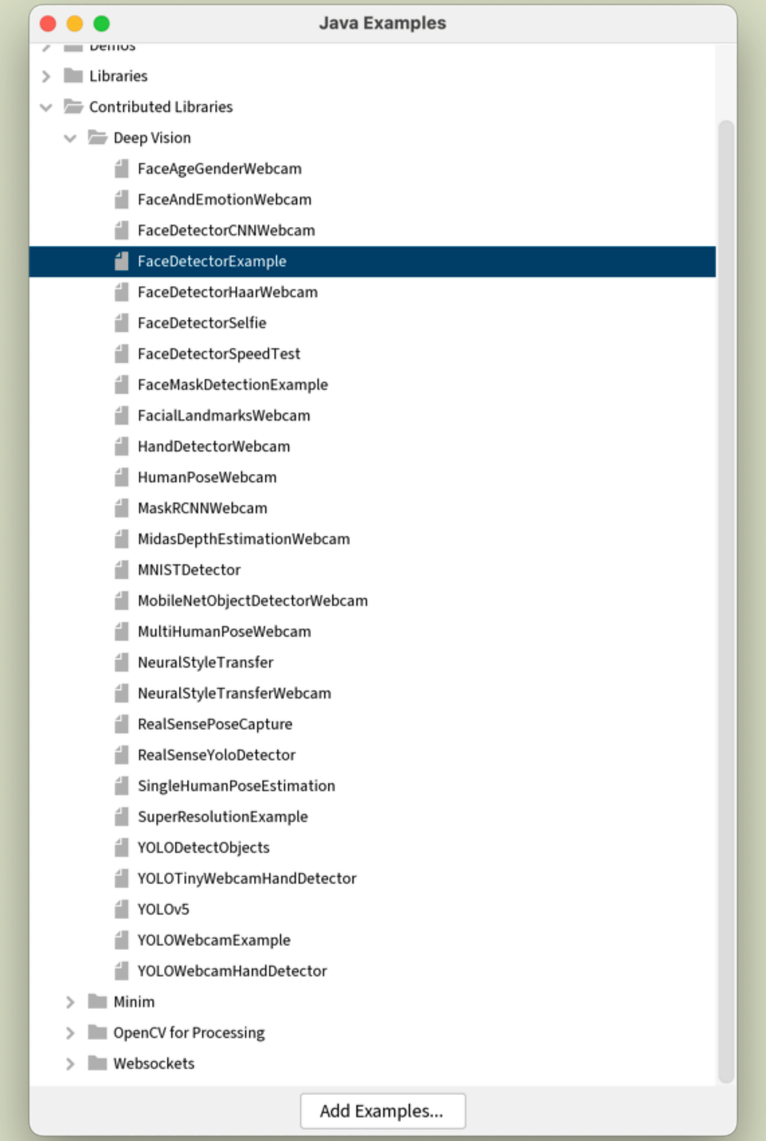
Caution: The API is still in development and can change at any time.

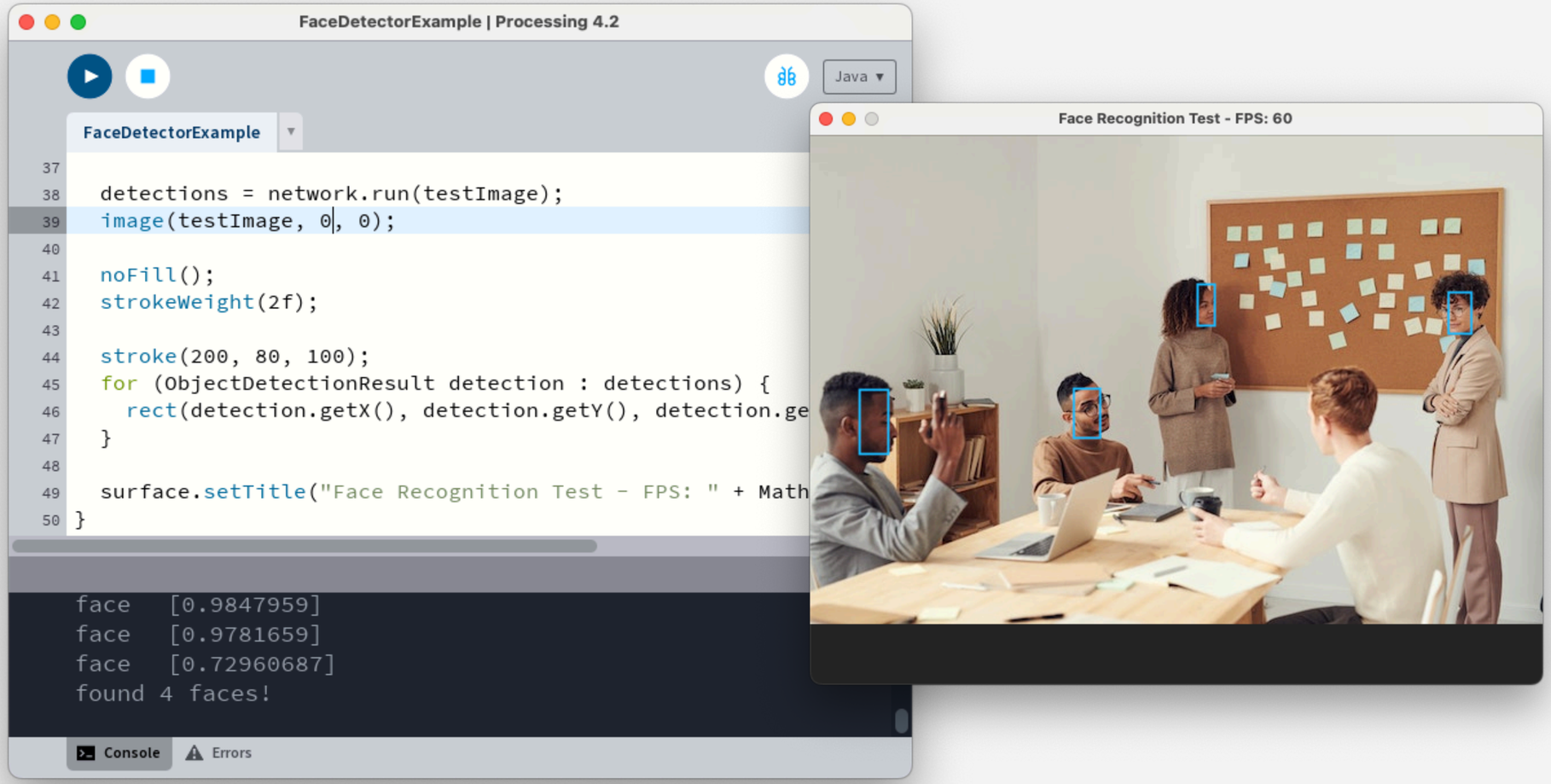
Languages

- Java 100.0%

https://github.com/cansik/deep-vision-processing


FaceDetectorExample | Processing 4.2
FaceDetectorExample
37
38 detections = network.run(testImage);
39 image(testImage, 0, 0);
40
41 noFill();
42 strokeWeight(2f);
43
44 stroke(200, 80, 100);
45 for (ObjectDetectionResult detection : detections) {
46 rect(detection.getX(), detection.getY(), detection
47 }
48
49 surface.setTitle("Face Recognition Test - FPS: " + M
50 }
face [0.9847959]
face [0.9781659]
face [0.72960687]
found 4 faces!
Console
Errors
YOLO Test - FPS: 60
clock
traffic light
bus
car
person
bicycle
motorbike

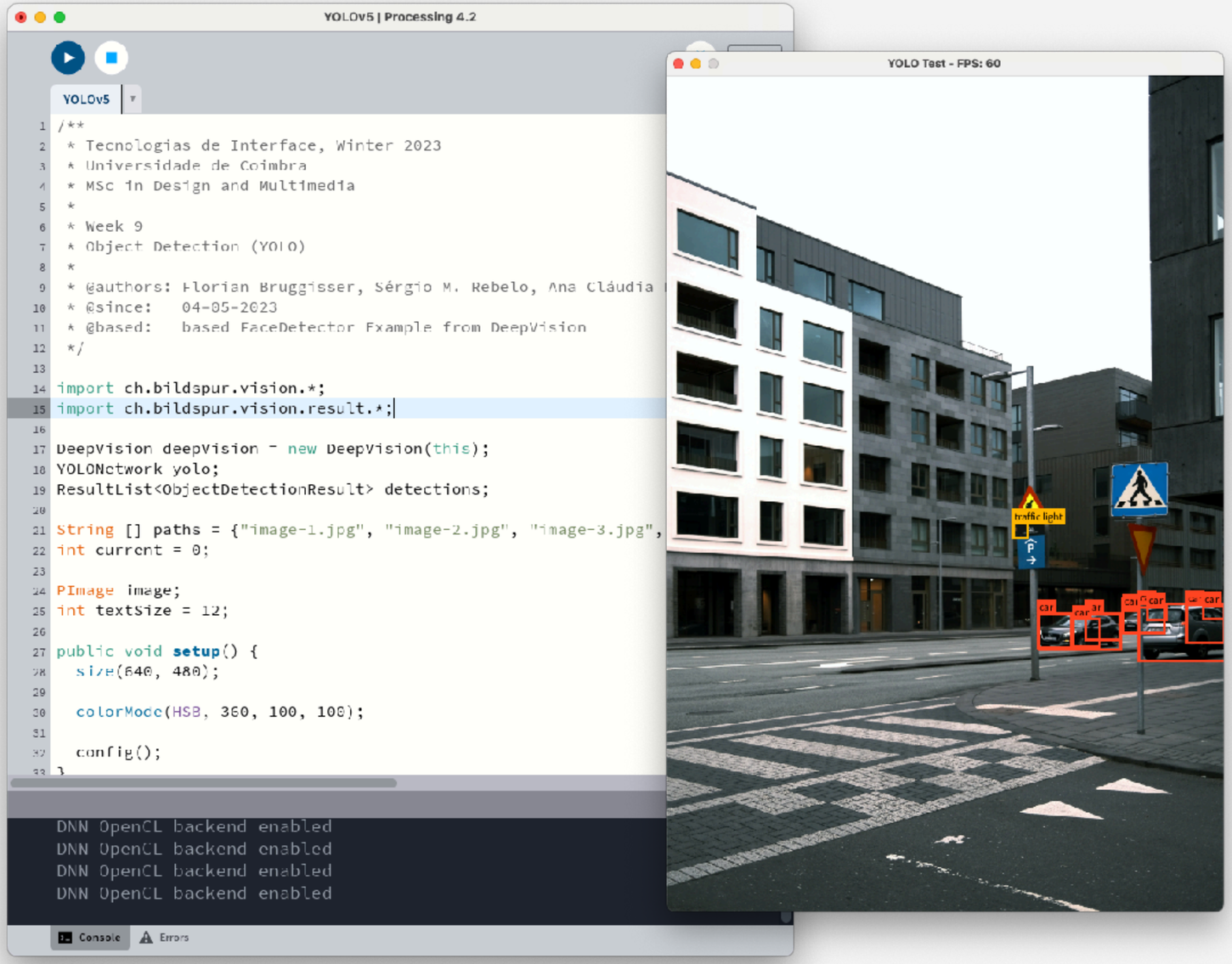

Java Examples
Libraries
Contributed Libraries
Deep Vision
FaceAgeGenderWebcam
FaceAndEmotionWebcam
FaceDetectorCNNWebcam
FaceDetectorExample
FaceDetectorHaarWebcam
FaceDetectorSelfie
FaceDetectorSpeedTest
FaceMaskDetectionExample
FacialLandmarksWebcam
HandDetectorWebcam
HumanPoseWebcam
MaskRCNNWebcam
MidasDepthEstimationWebcam
MNISTDetector
MobileNetObjectDetectorWebcam
MultiHumanPoseWebcam
NeuralStyleTransfer
NeuralStyleTransferWebcam
RealSensePoseCapture
RealSenseYoloDetector
SingleHumanPoseEstimation
SuperResolutionExample
YOLODetectObjects
YOLOTinyWebcamHandDetector
YOLOv5
YOLOWebcamExample
YOLOWebcamHandDetector
Minim
OpenCV for Processing
Websockets
Add Examples...



Face Detection

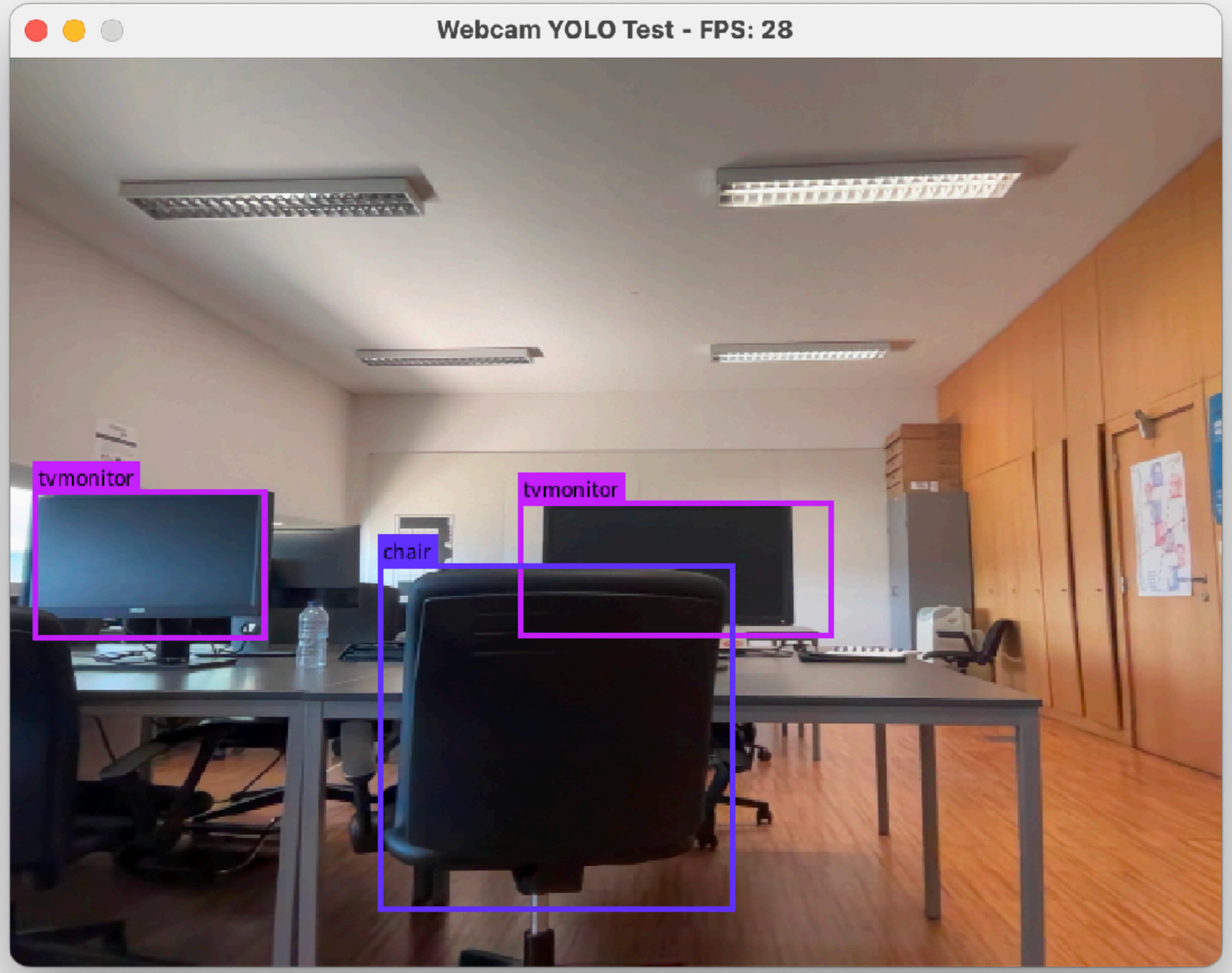
Examples → Contributed Libraries → DeepVision → FaceDetectorExample

or https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/4-FaceDetection/FaceDetectorML

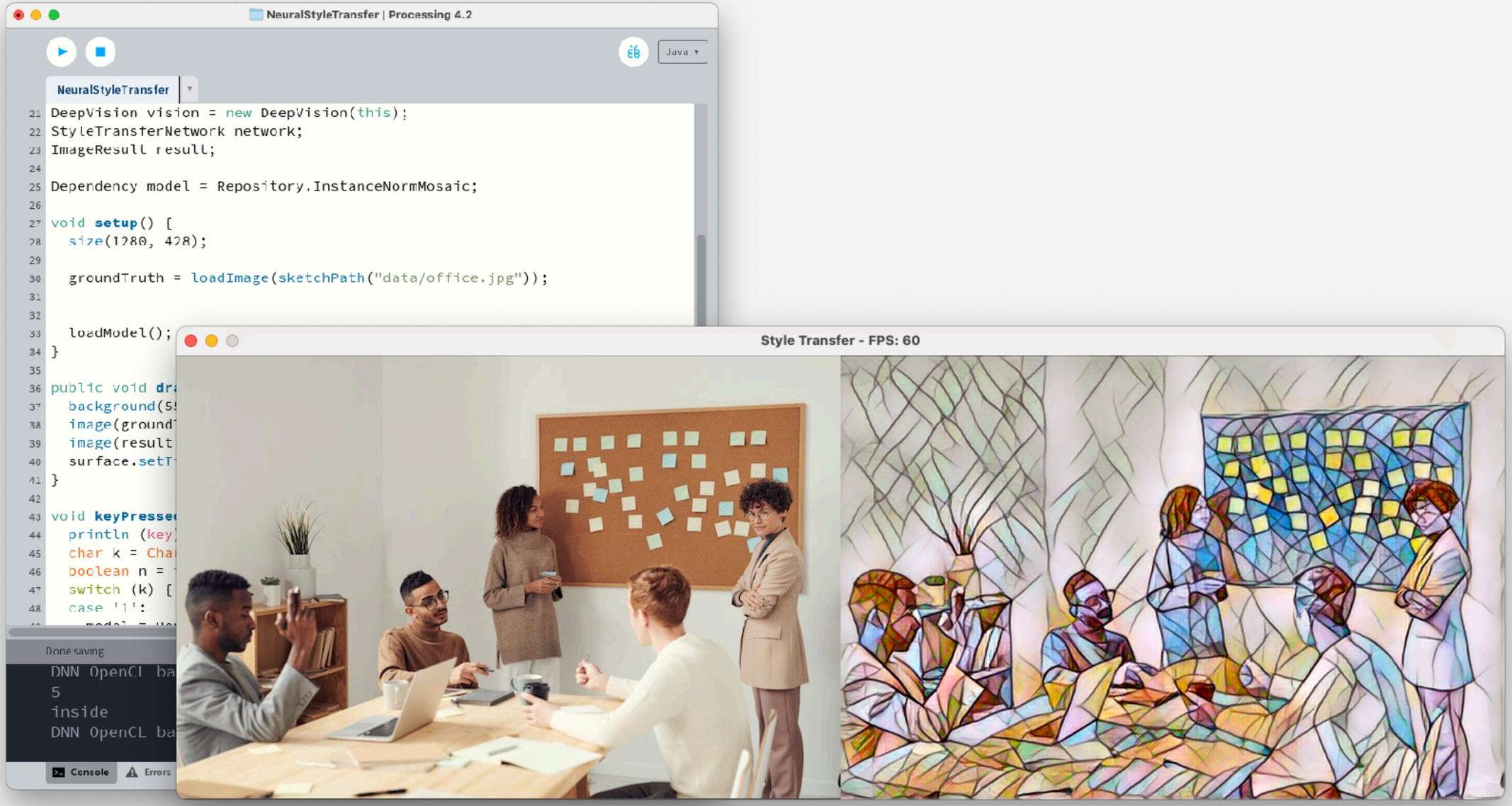


Object Detection (YOLO)

https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/6-ObjectDetection/YOLO

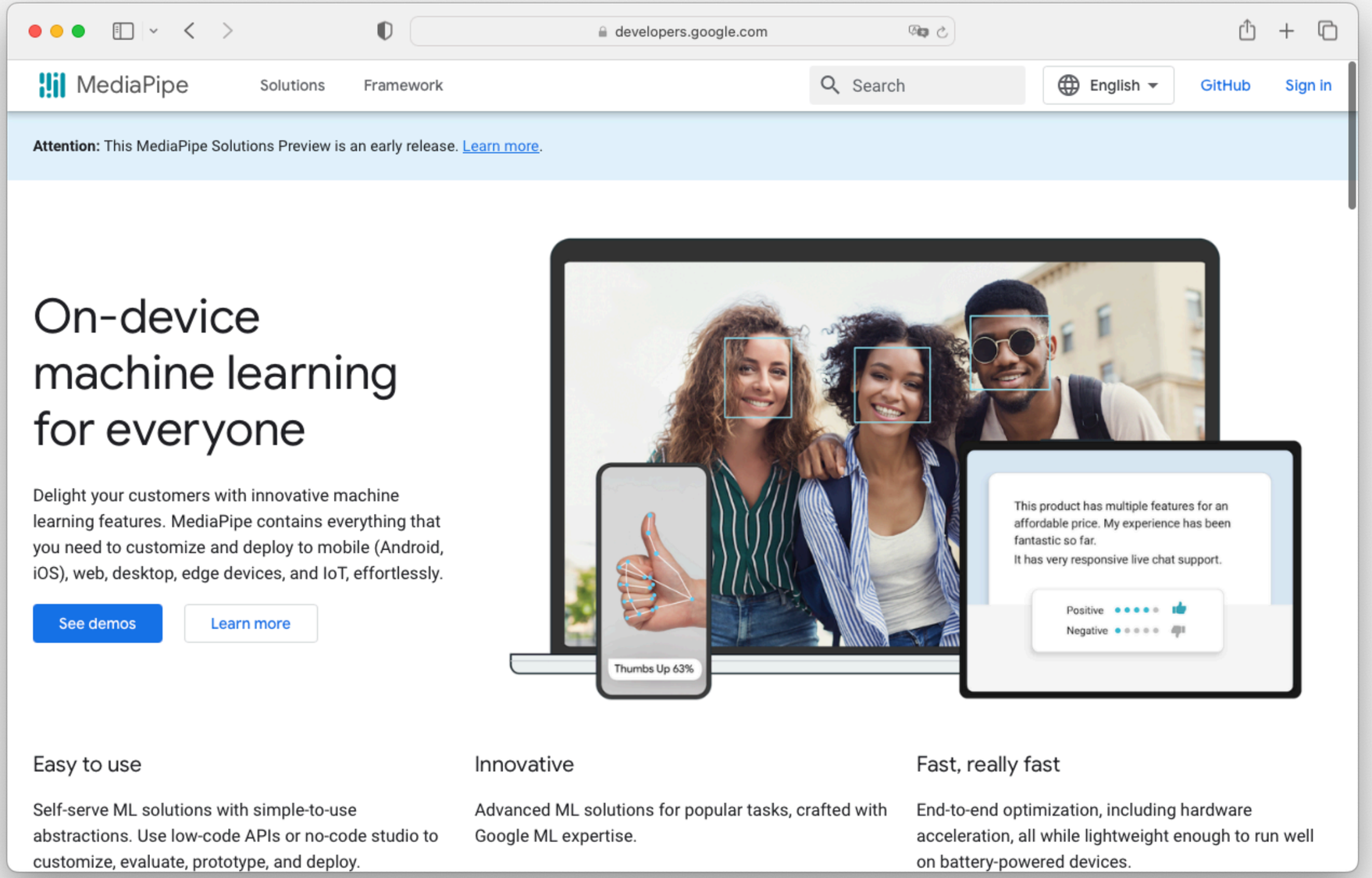


https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/6-ObjectDetection/webcamYOLO



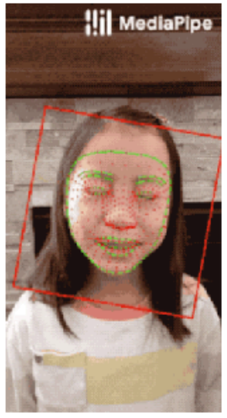
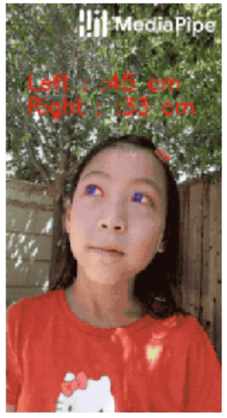
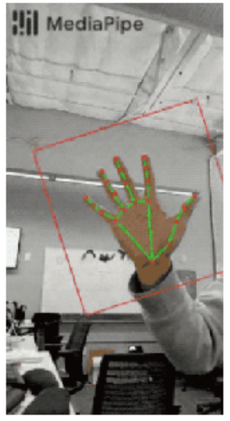
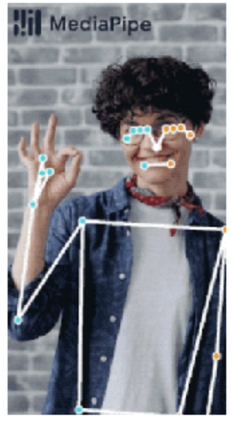
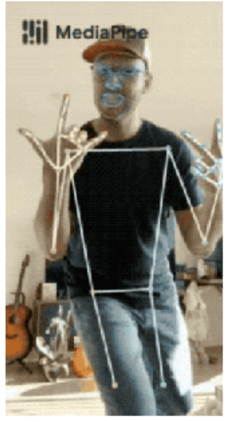
Neural Style Transfer

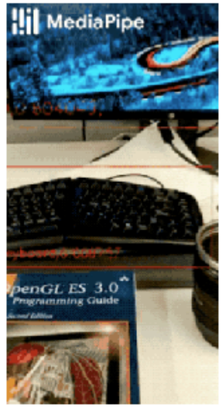
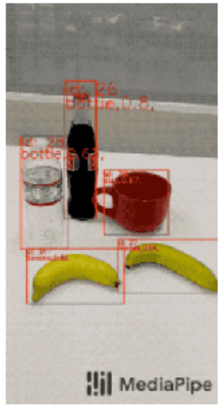
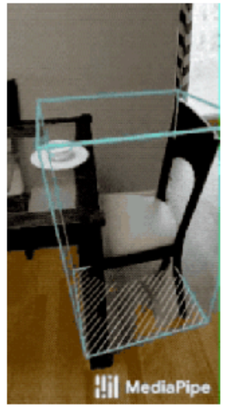
https://github.com/sergiomrebelo/amazing-robots-cv/tree/main/Demos/7-NeuralStyleTransfer

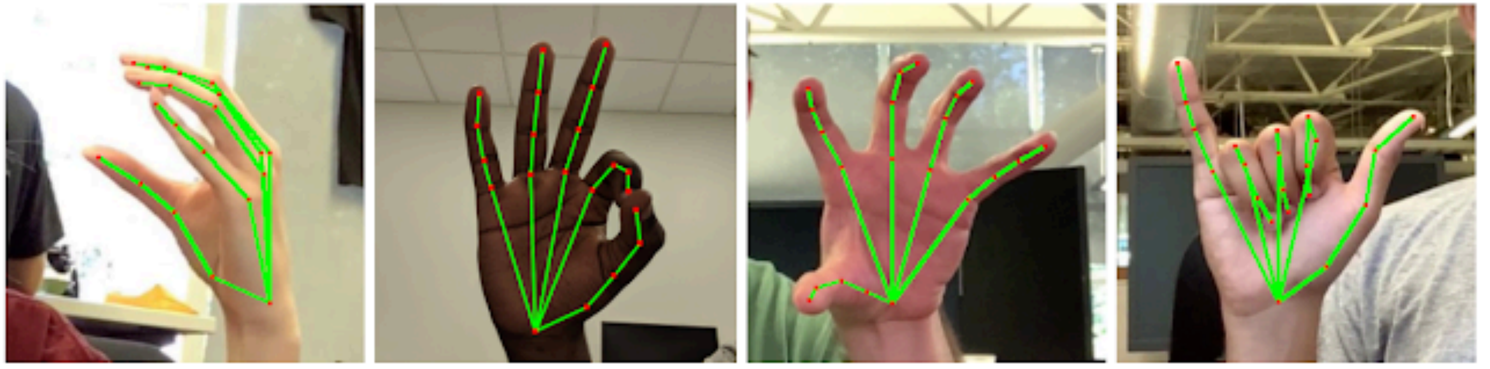


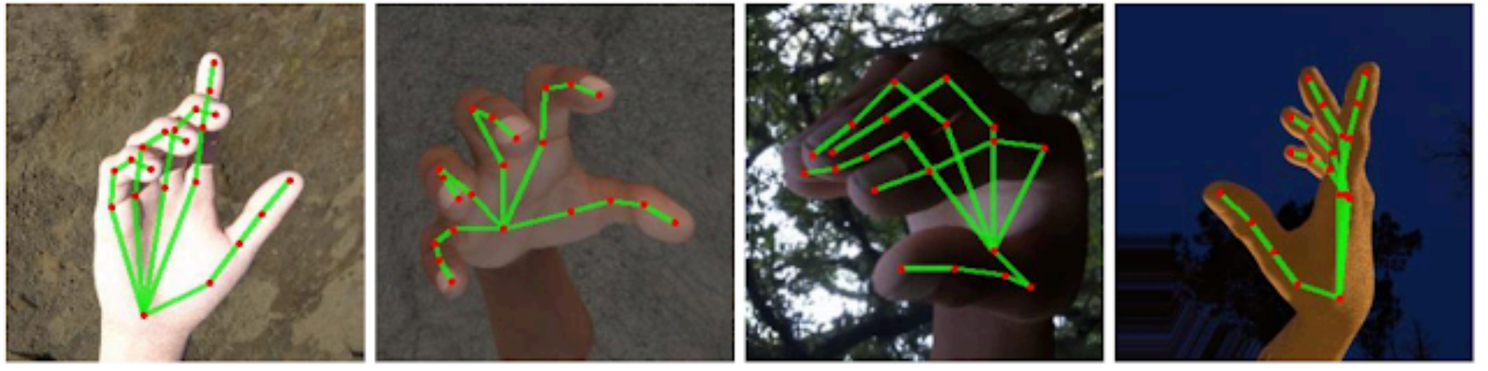
https://developers.google.com/mediapipe

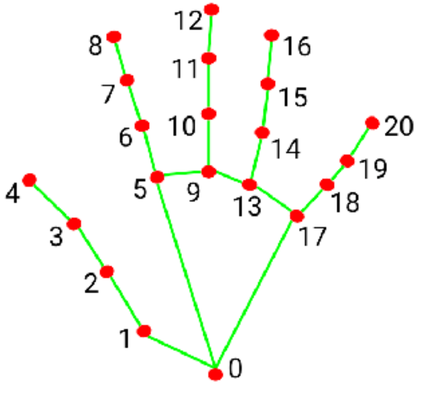
ML solutions in MediaPipe

Face Detection	Face Mesh	Iris	Hands	Pose	Holistic
					

Hair Segmentation	Object Detection	Box Tracking	Instant Motion Tracking	Objectron	KNIFT
					

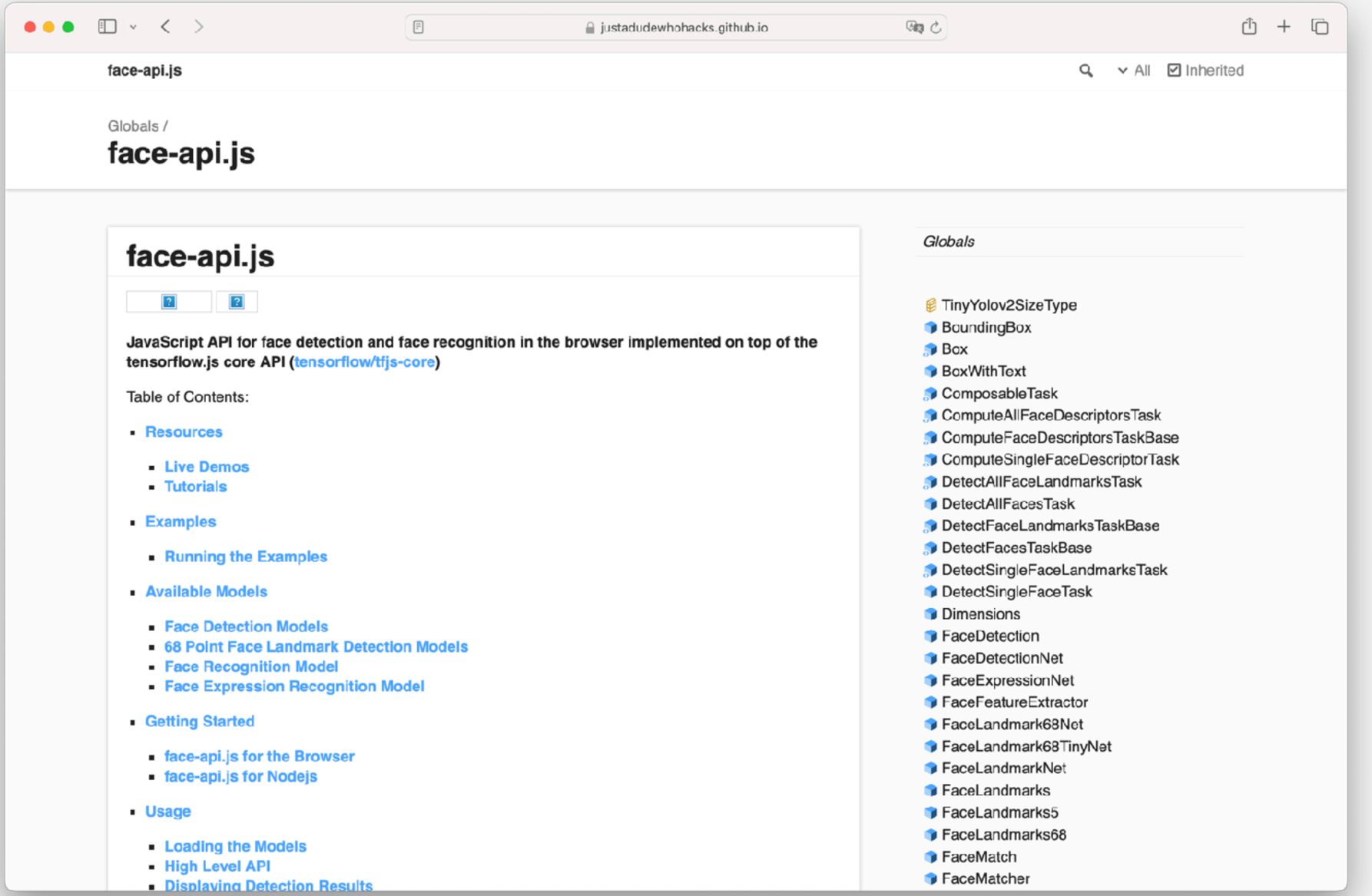




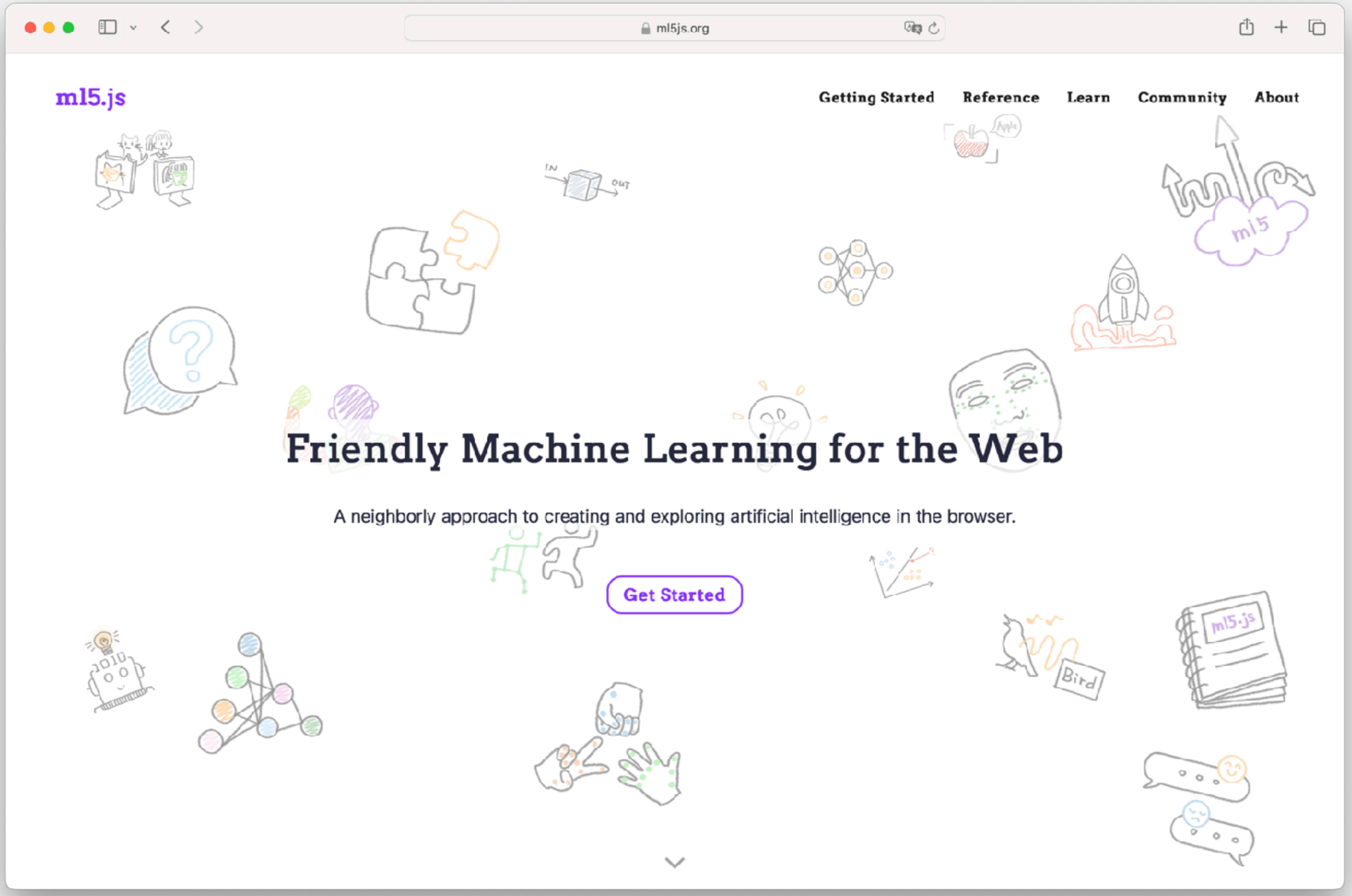


0. WRIST
1. THUMB_CMC
2. THUMB_MCP
3. THUMB_IP
4. THUMB_TIP
5. INDEX_FINGER_MCP
6. INDEX_FINGER_PIP
7. INDEX_FINGER_DIP
8. INDEX_FINGER_TIP
9. MIDDLE_FINGER_MCP
10. MIDDLE_FINGER_PIP
11. MIDDLE_FINGER_DIP
12. MIDDLE_FINGER_TIP
13. RING_FINGER_MCP
14. RING_FINGER_PIP
15. RING_FINGER_DIP
16. RING_FINGER_TIP
17. PINKY_MCP
18. PINKY_PIP
19. PINKY_DIP
20. PINKY_TIP

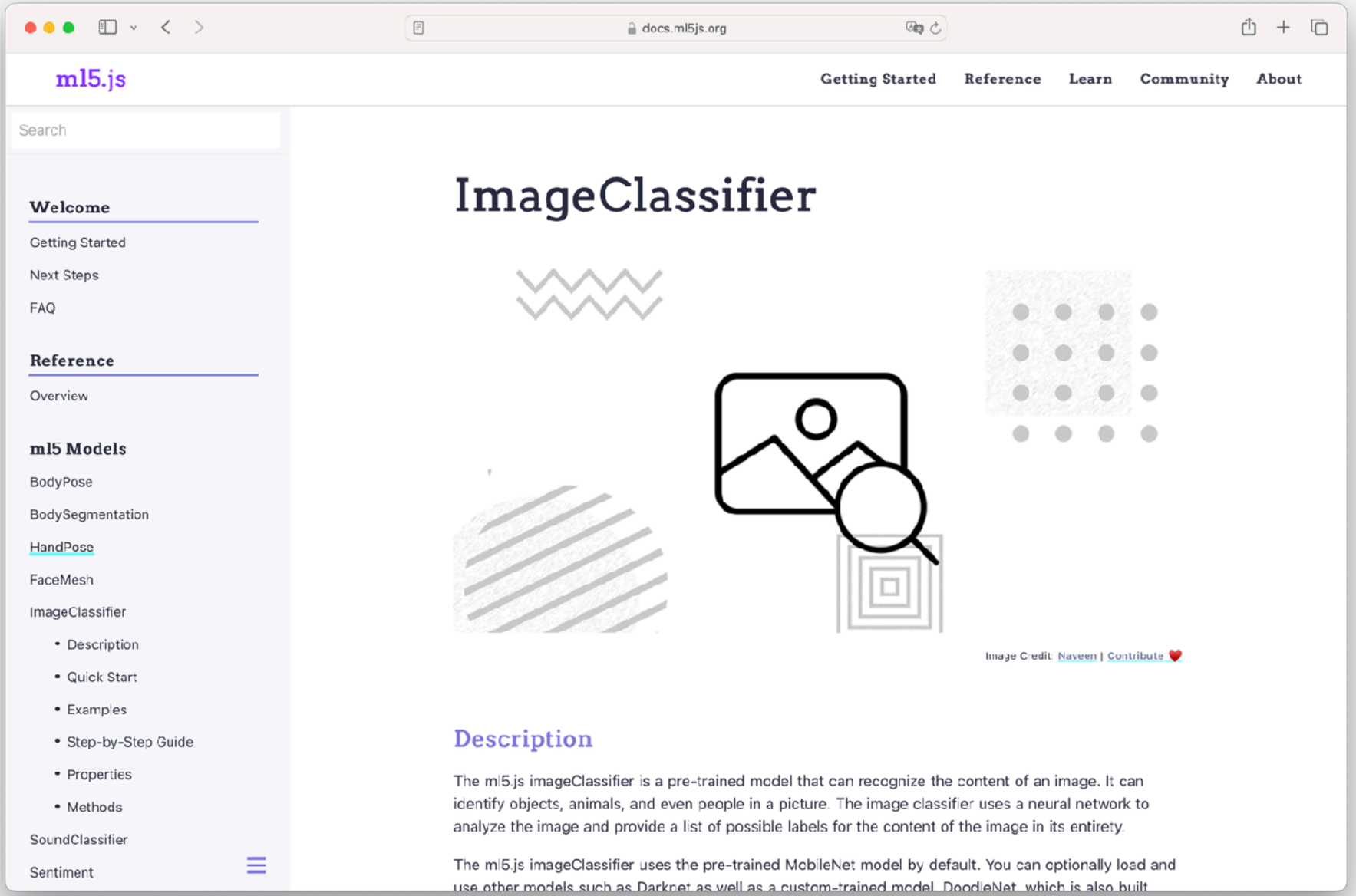
https://developers.google.com/mediapipe/solutions/vision/hand_landmarker



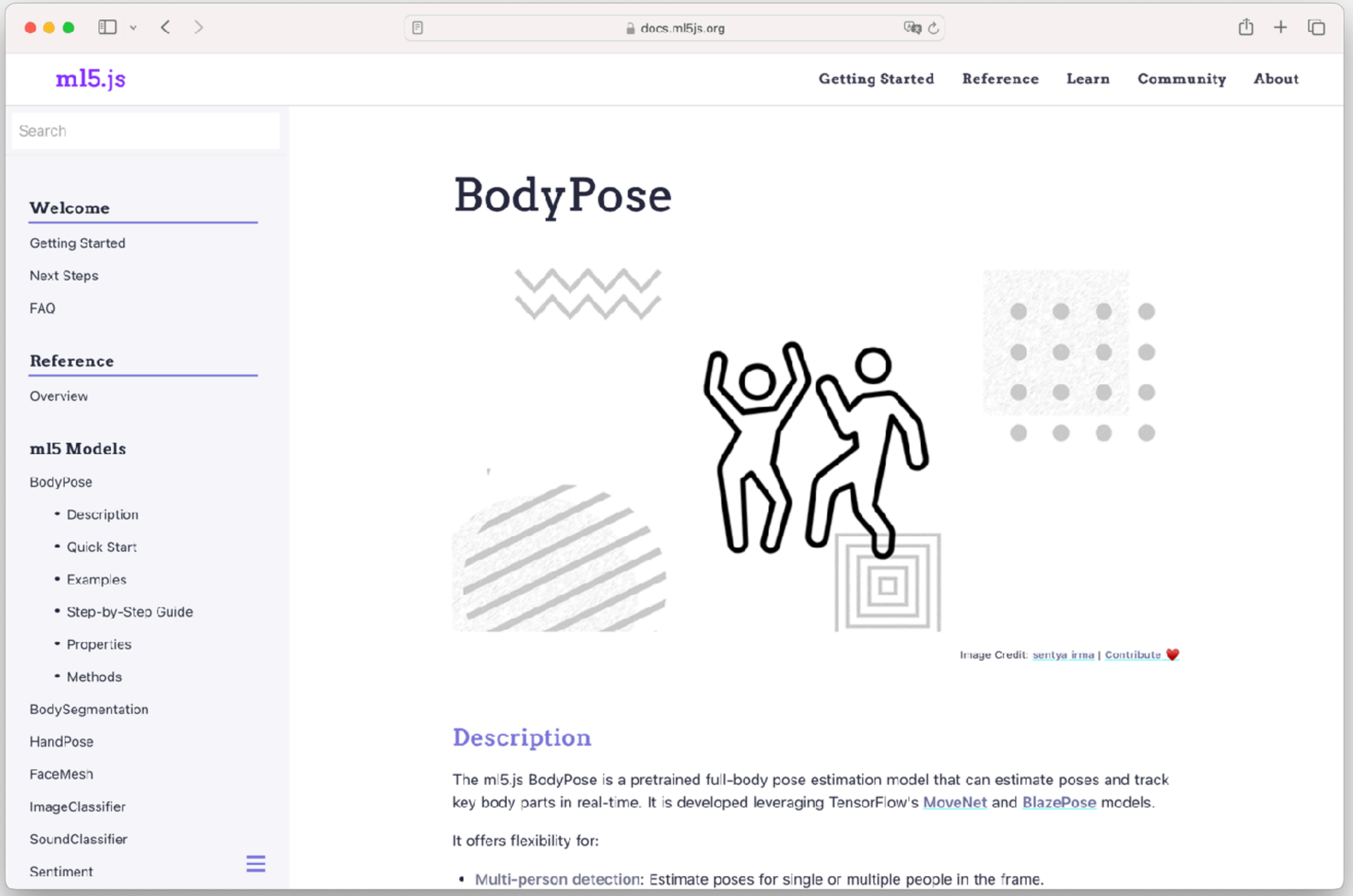
https://justadudewhohacks.github.io/face-api.js/docs/index.html



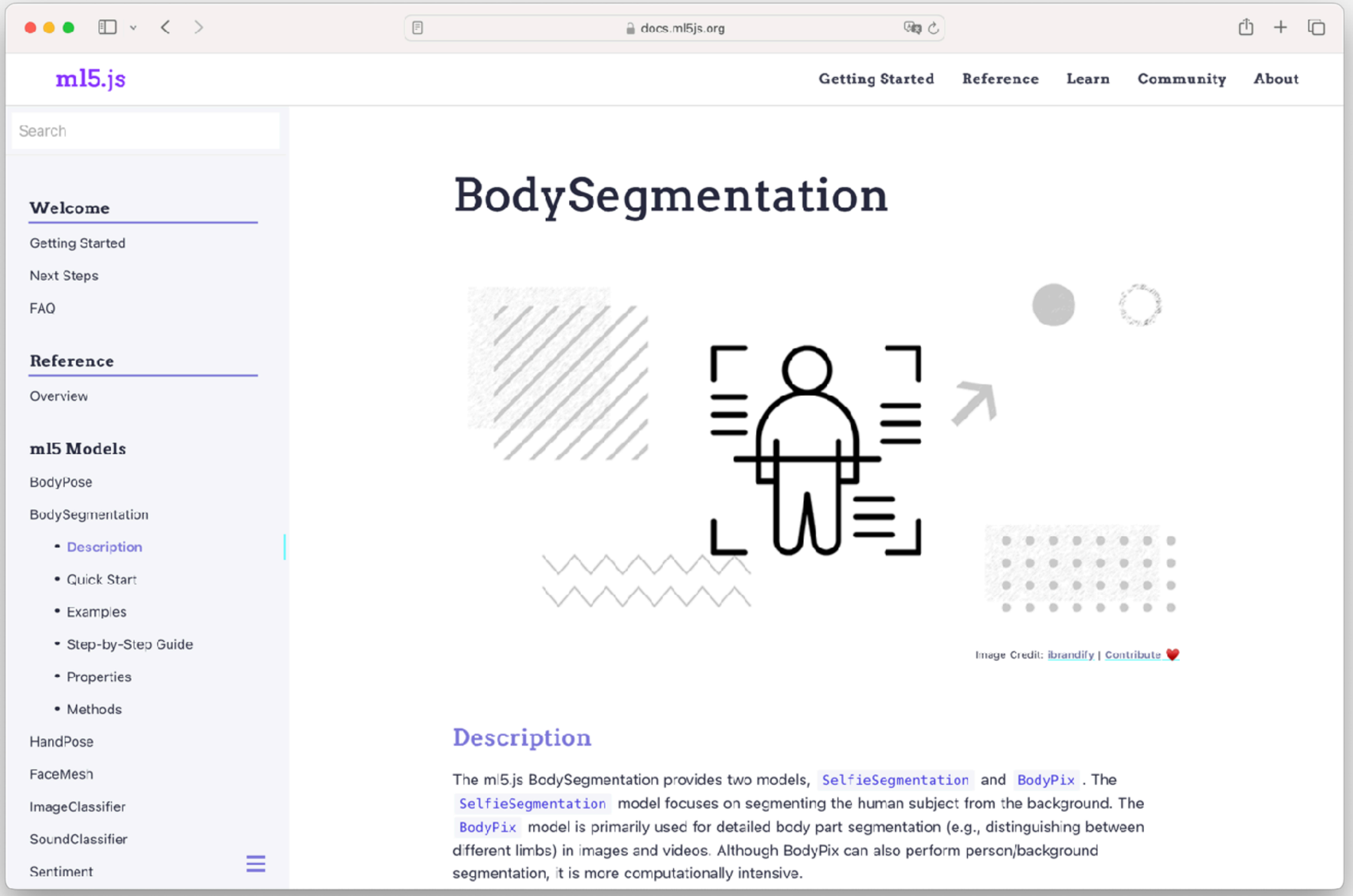
https://ml5js.org



https://docs.ml5js.org/#/reference/image-classifier



https://docs.ml5js.org/#/reference/bodypose



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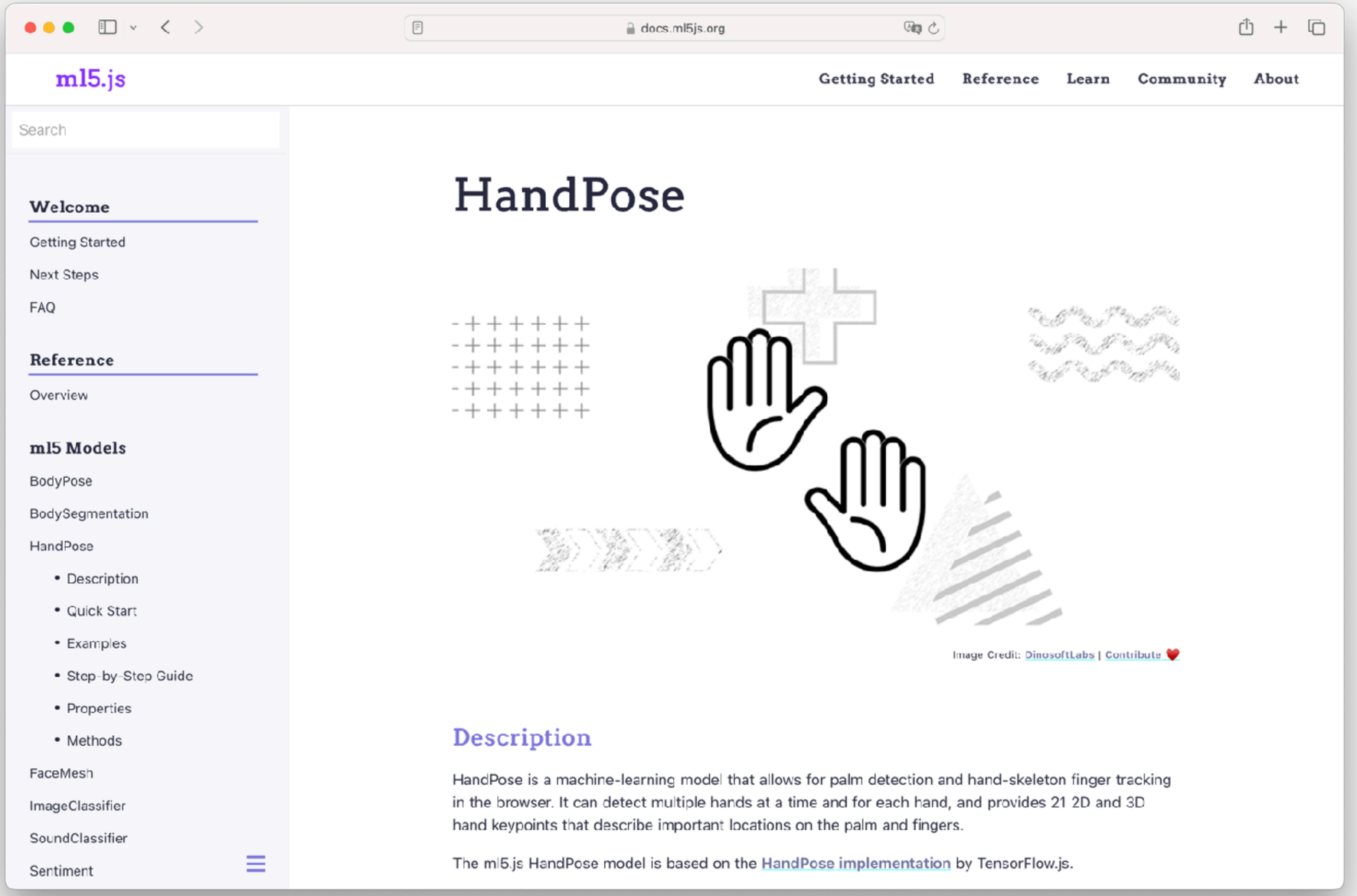
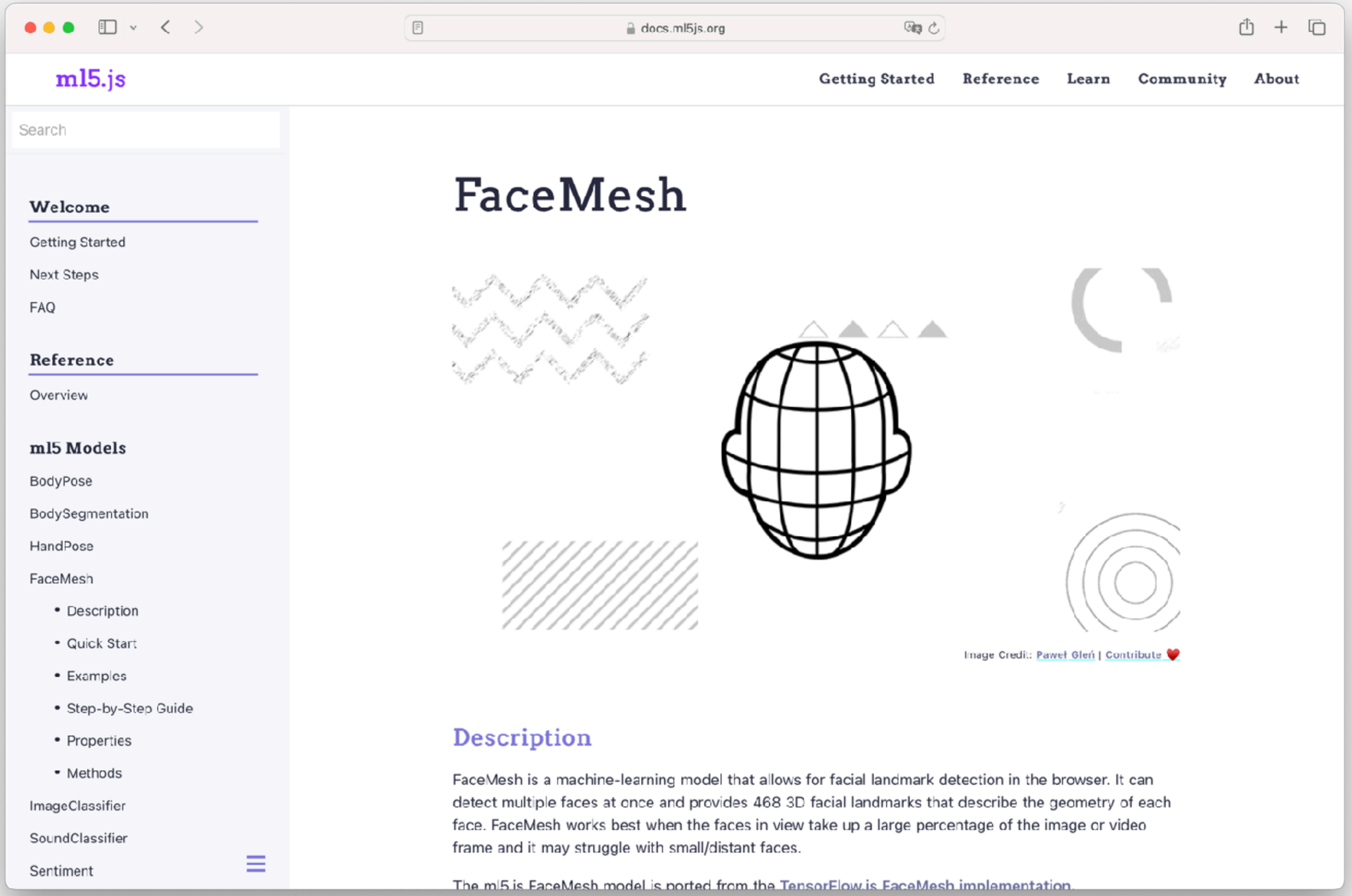
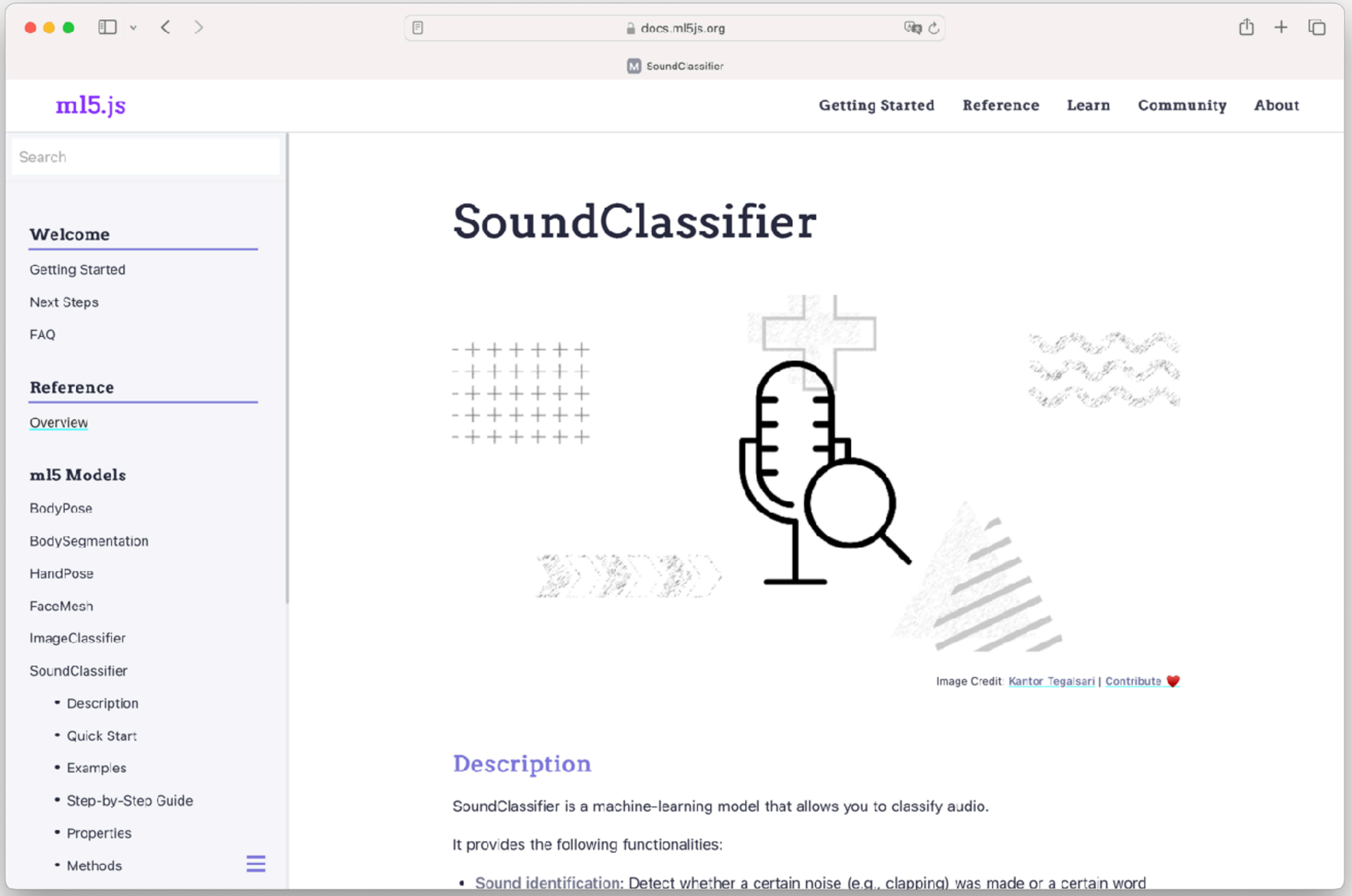


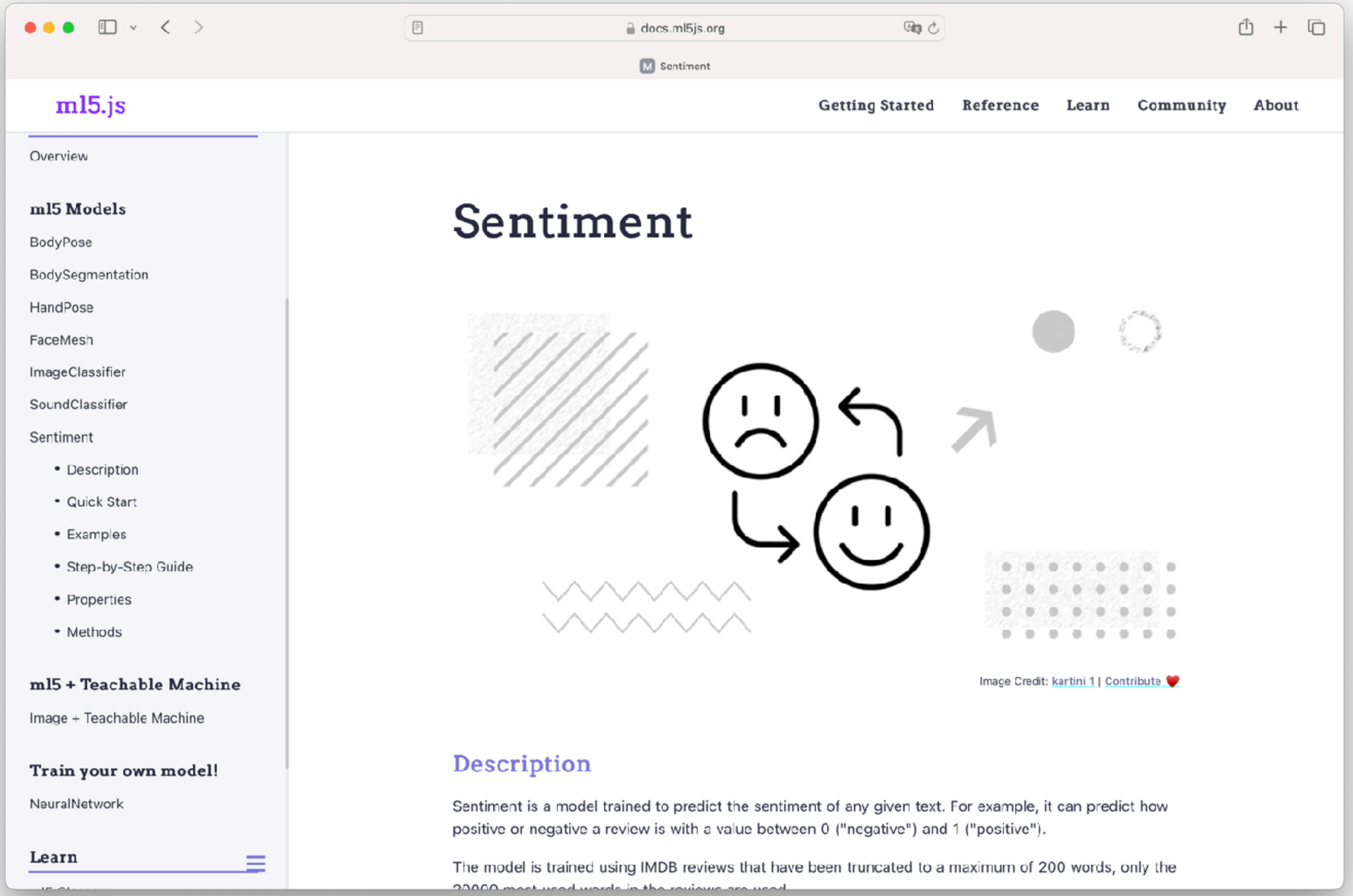
https://docs.ml5js.org/#/reference/handpose



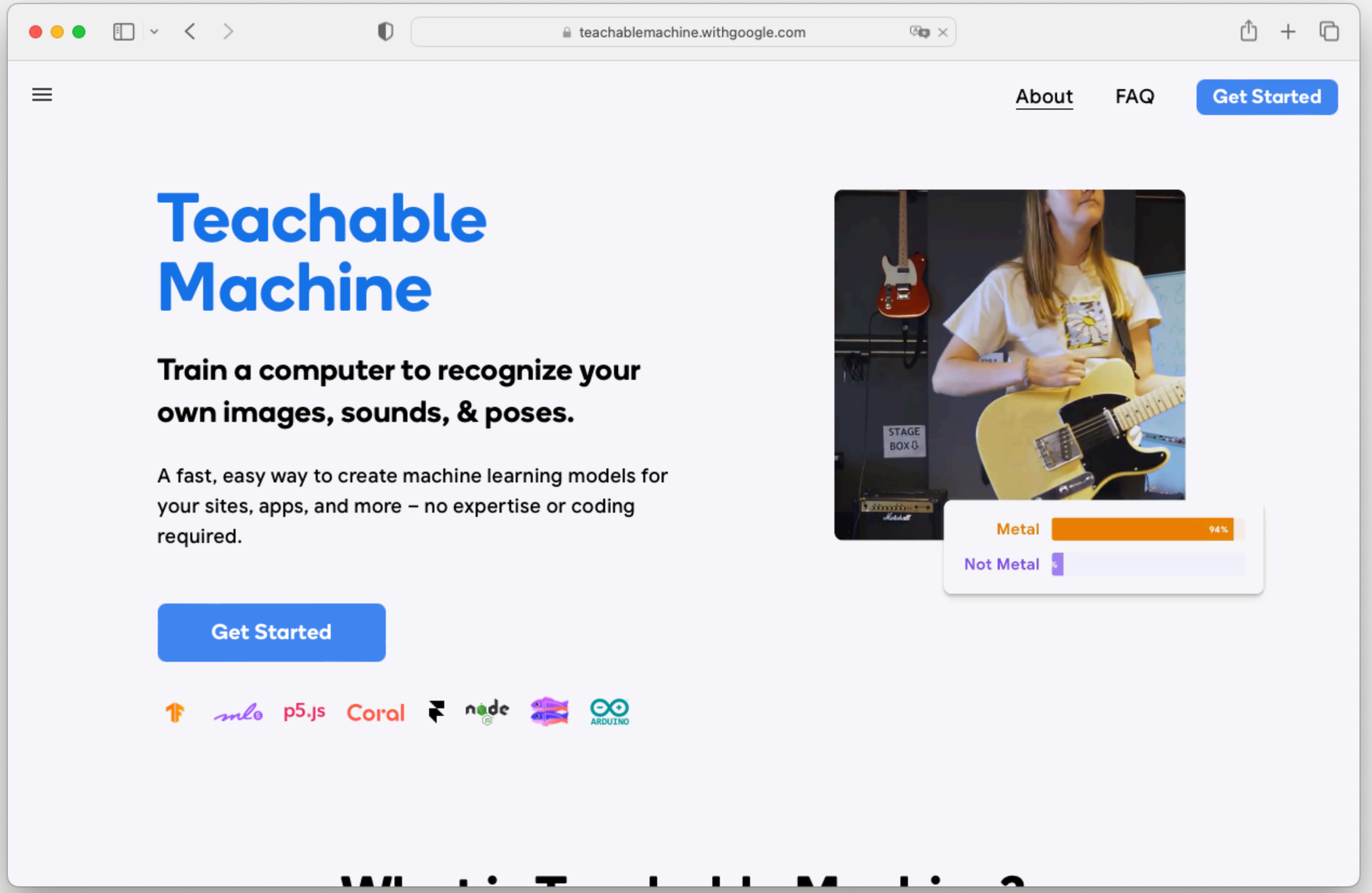
https://docs.ml5js.org/#/reference/facemesh



https://docs.ml5js.org/#/reference/sound-classifier

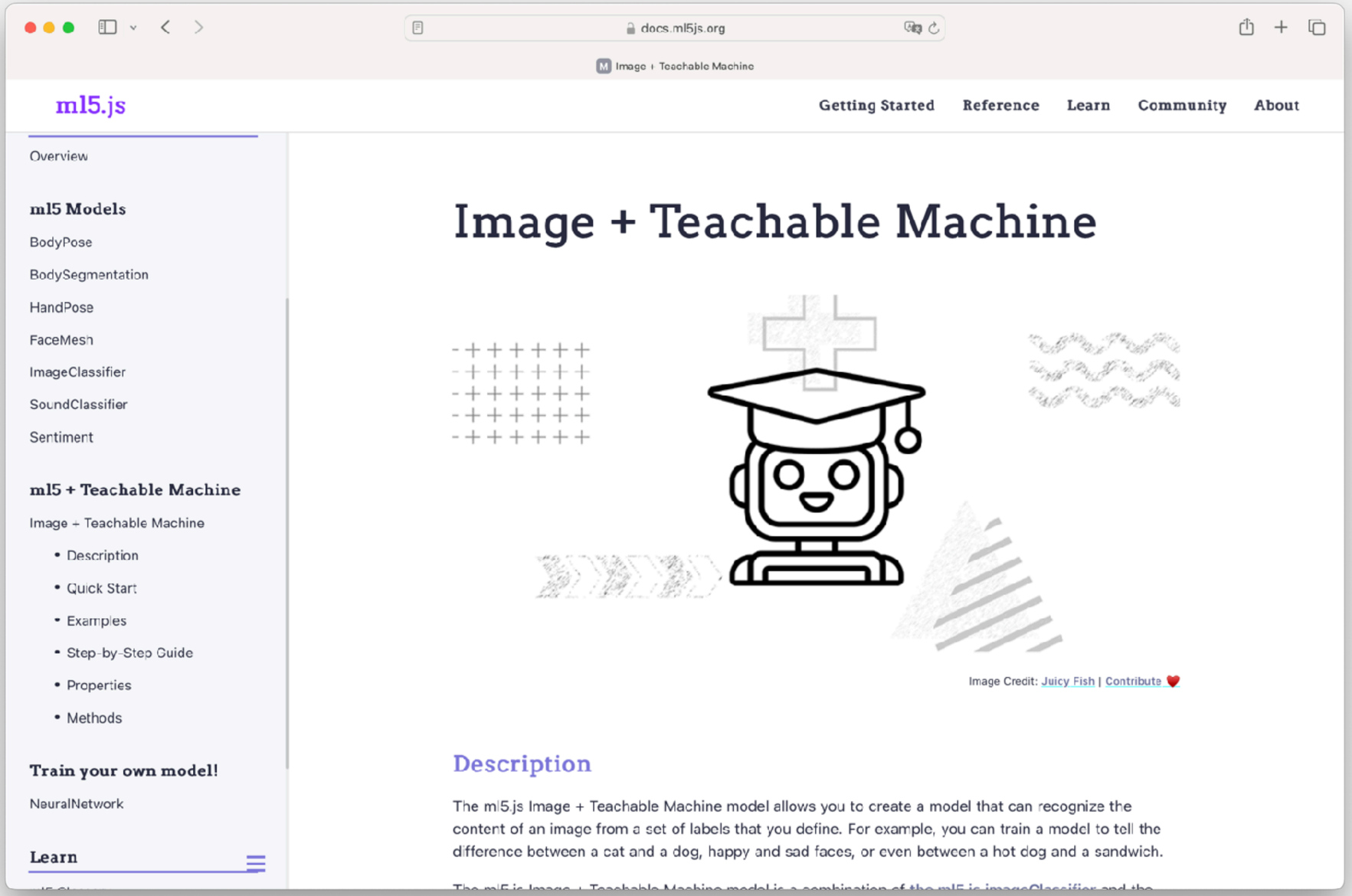


https://docs.ml5js.org/#/reference/sentiment



https://teachablemachine.withgoogle.com/

https://www.youtube.com/watch?v=3BhkeY974Rg



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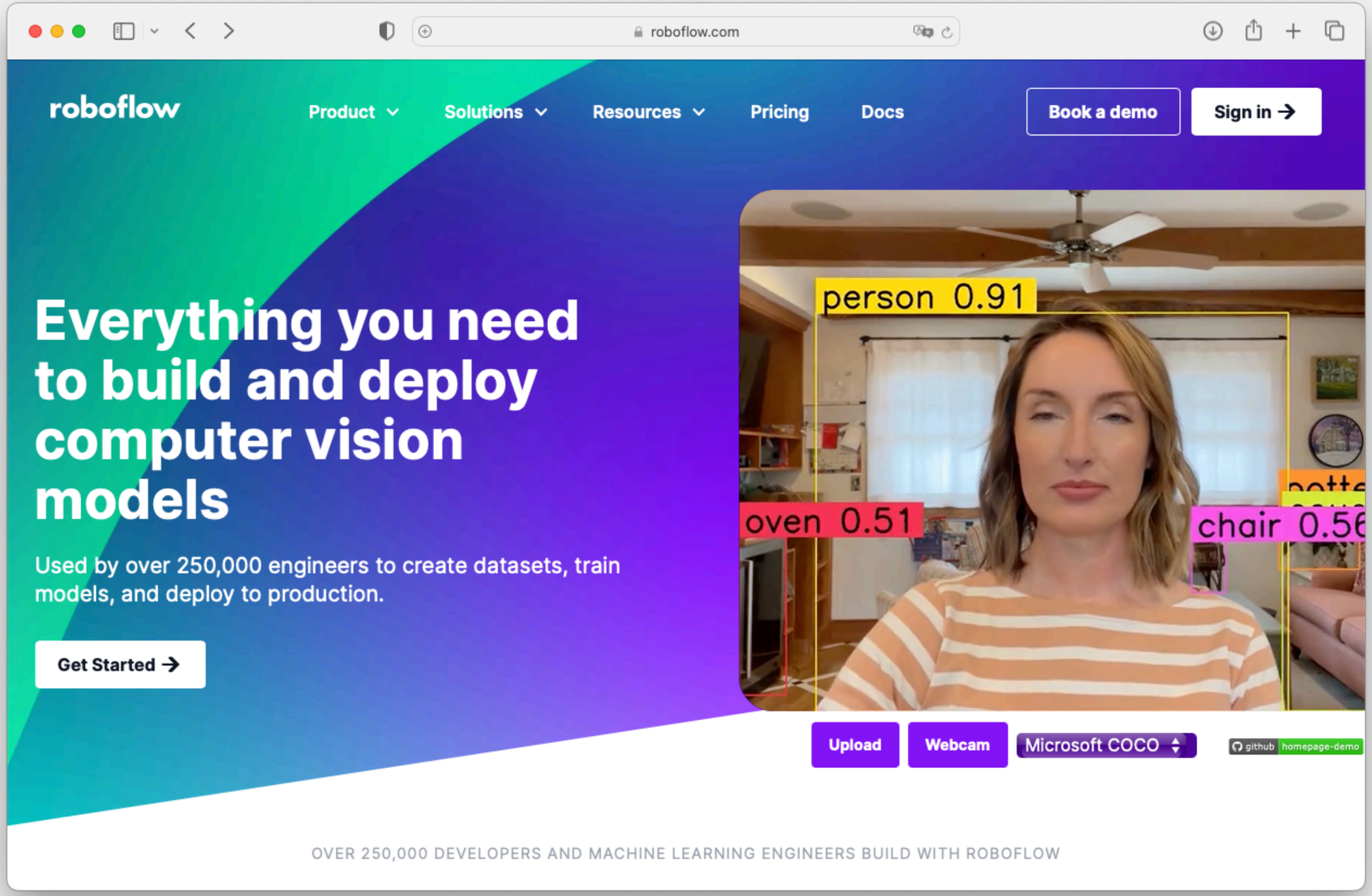

https://roboflow.com/

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