

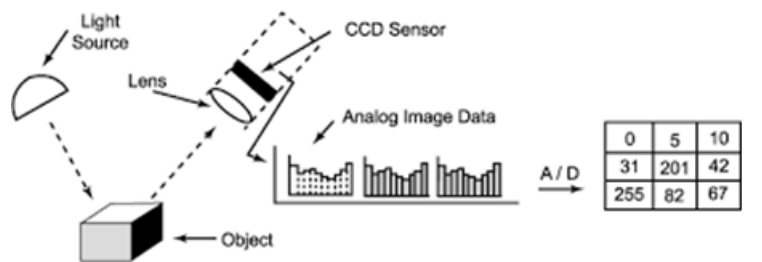
AI인력양성지원사업

- 이로스타일 알앤엑스 에이제이투 ITCG-

3주차(6월 28일)

정 준 수

실습 및 운영 환경



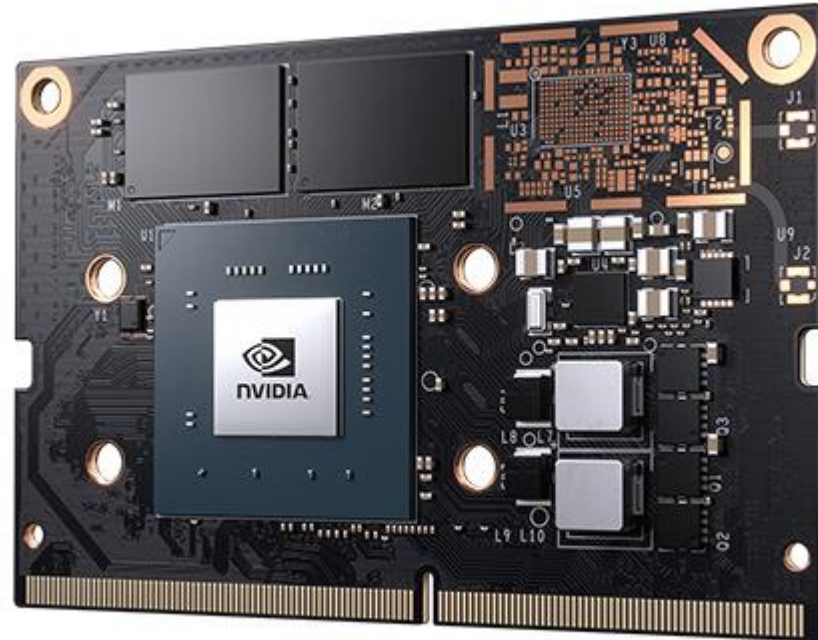
입력 데이터 →



실습 & 개발 Framework

구분	데이터 Featuring	영상 처리
이로스타일	<ul style="list-style-type: none">• scikit-learn	<ul style="list-style-type: none">▪ OpenCV▪ Keras(TensorFlow)▪ PyTorch3D
알앤엑스	<ul style="list-style-type: none">• scikit-learn	<ul style="list-style-type: none">▪ OpenCV▪ Keras(TensorFlow)▪ PyTorch3D
에이제이투	<ul style="list-style-type: none">• scikit-learn	<ul style="list-style-type: none">▪ OpenCV▪ Keras(TensorFlow)▪ TensorFlow Lite

영상처리 Edge Device



Jetson Nano 4GB (무선 키보드 & 마우스 별도)
(<https://developer.nvidia.com/embedded/jetson-nano>)

웹카메라

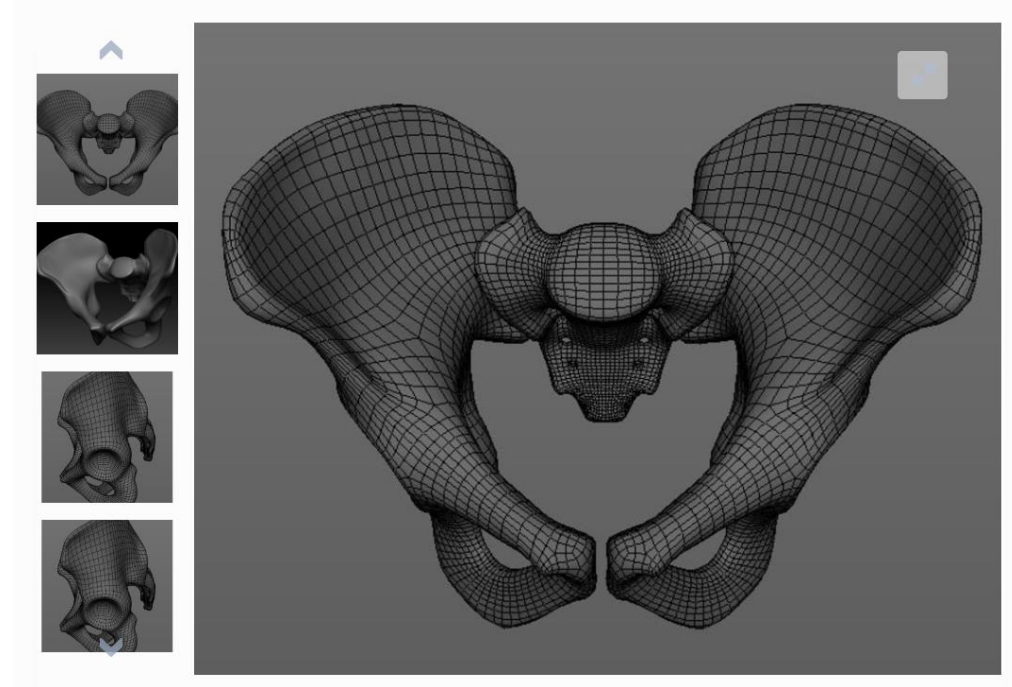


1080P USB 3.0 웹캠 MJPEG 50fps 고속 가변 초점 컴퓨터 PC 웹카메라 카메라

3D 교육용 영상 모델(3D Mesh)



<https://free3d.com/3d-model/feet-2373.html>



<https://free3d.com/3d-model/pelvis-595.html>

데이터 수집 & 모델 생성 자동화 (Python)

RPA.Cloud.AWS

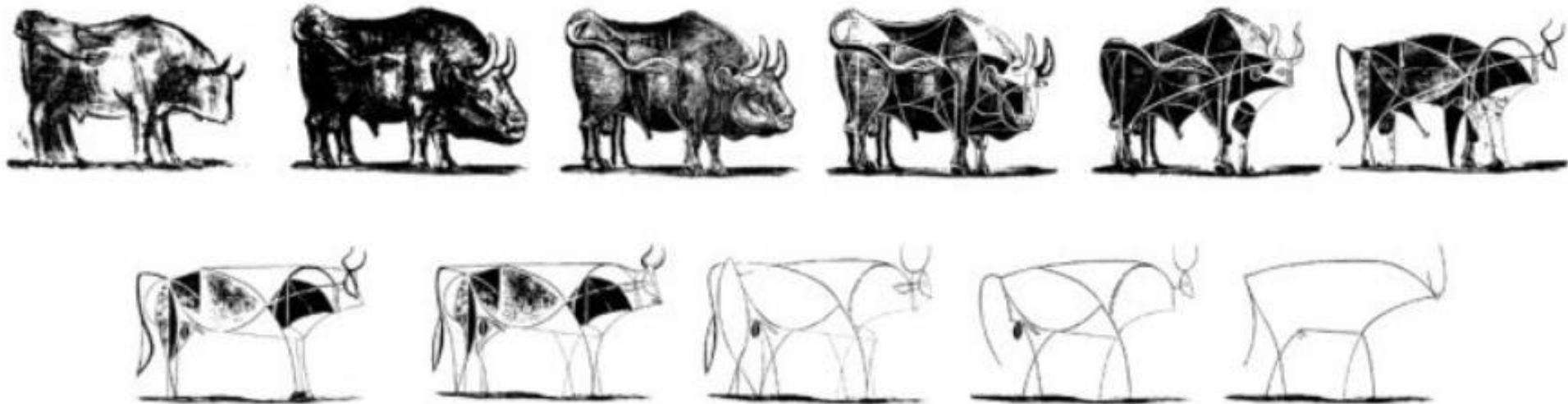
<https://robocorp.com/docs/libraries/rpa-framework/rpa-cloud-aws>

Data의 추상화 - Featuring

2022 05 16

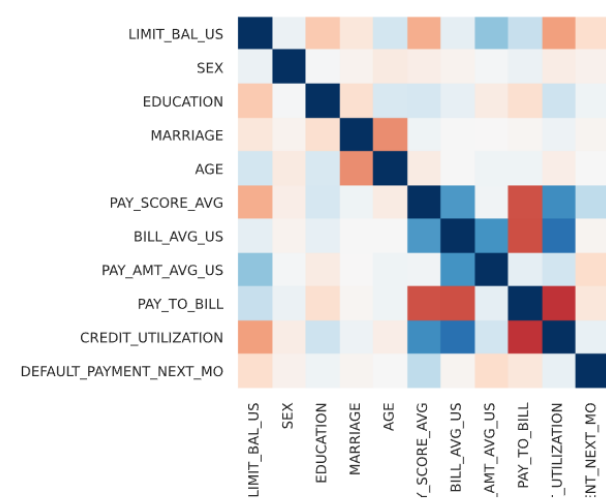
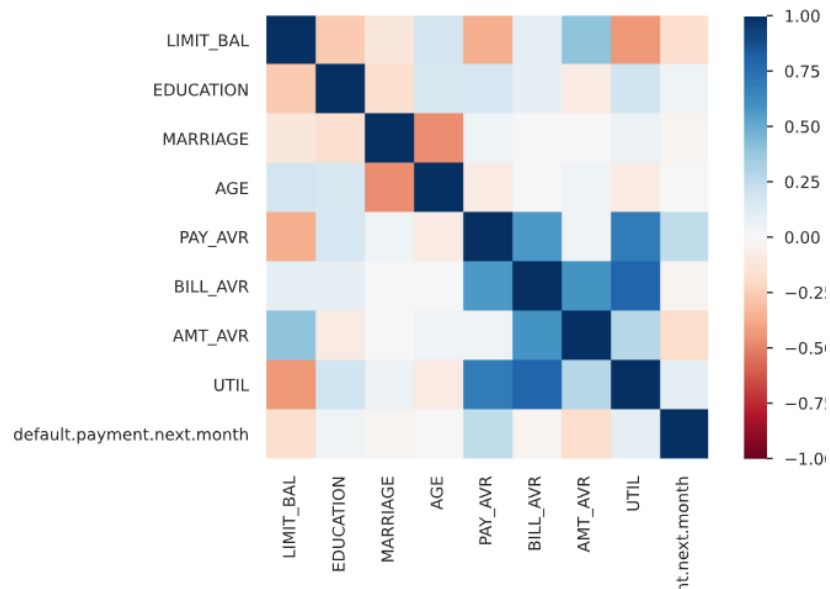
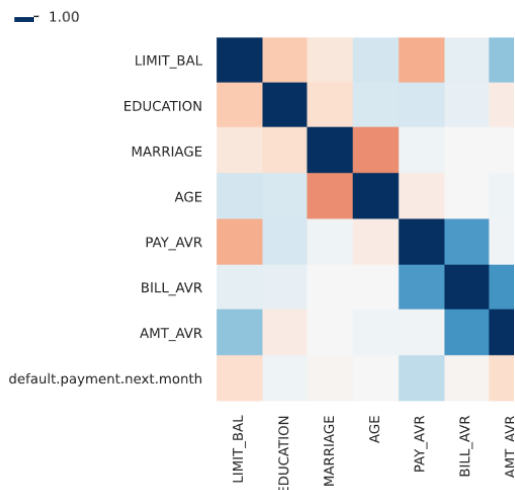
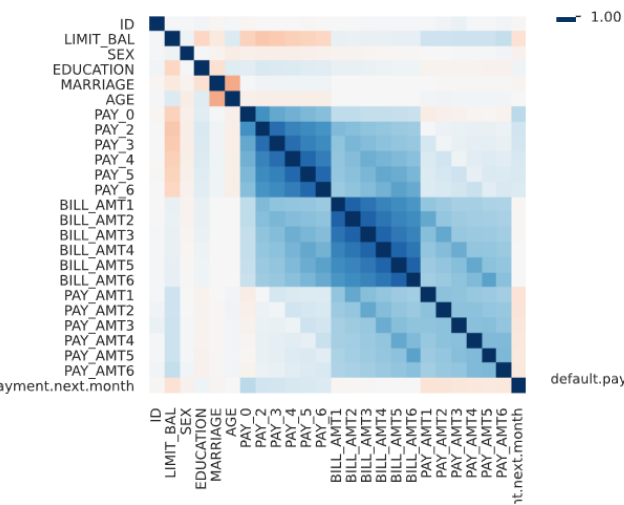
정 준 수

The Evolution of Picasso Bull

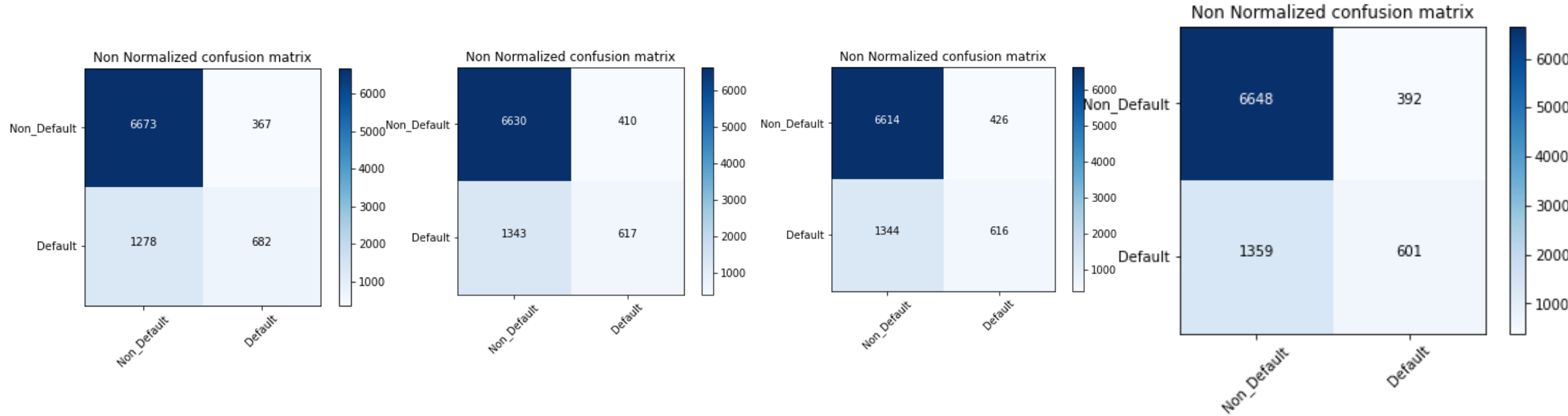


다중공선성(Multicollinearity)의 제거

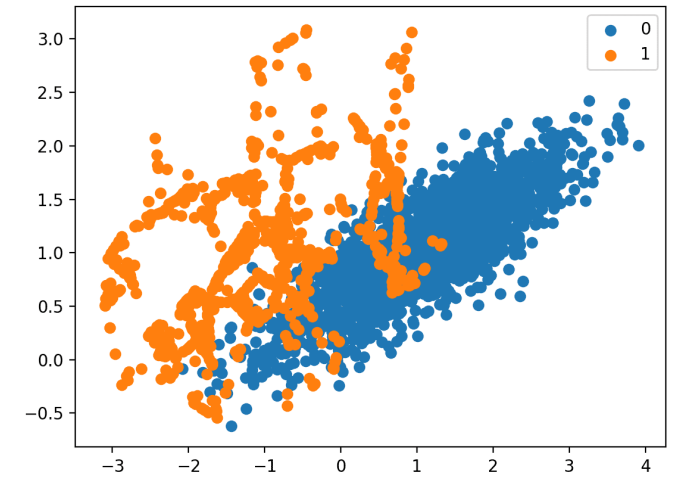
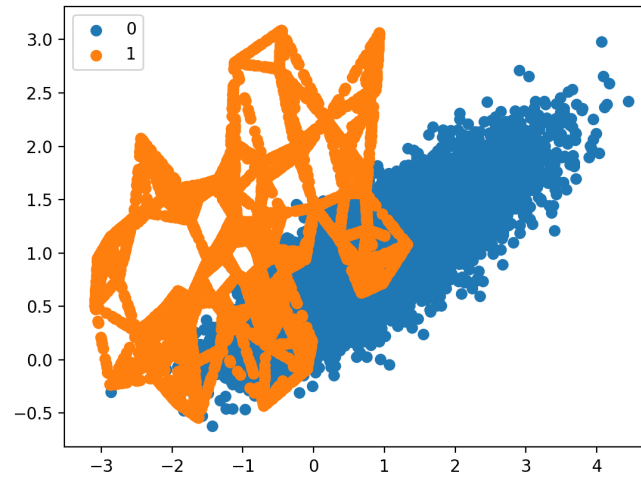
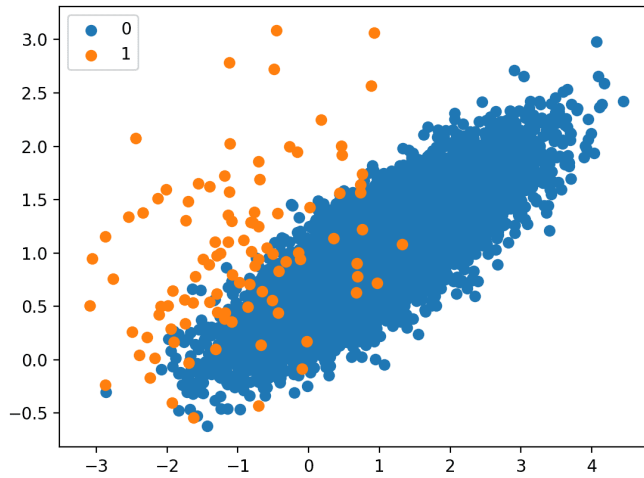
독립변수간의 상관성(Correlation) 을 제거



결과 비교

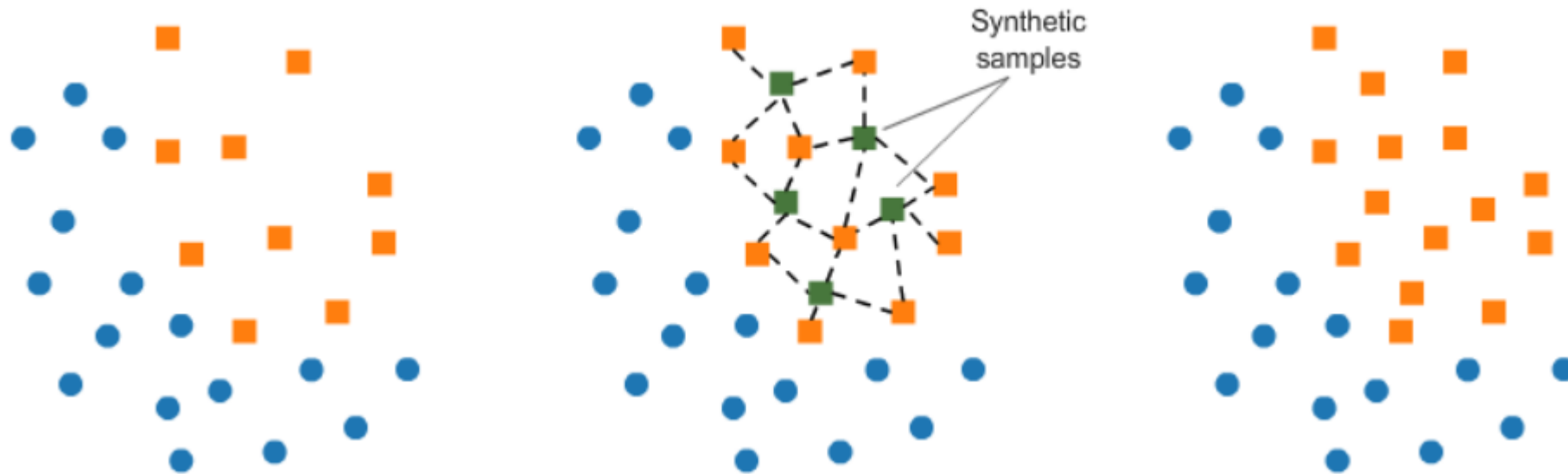


SMOTE for Balancing Data



<https://machinelearningmastery.com/smote-oversampling-for-imbalanced-classification/>

SMOTE 의 작동 방식



OpenCV

색공간

https://github.com/JSJeong-me/OpenCV_Practitioner_Guide_1

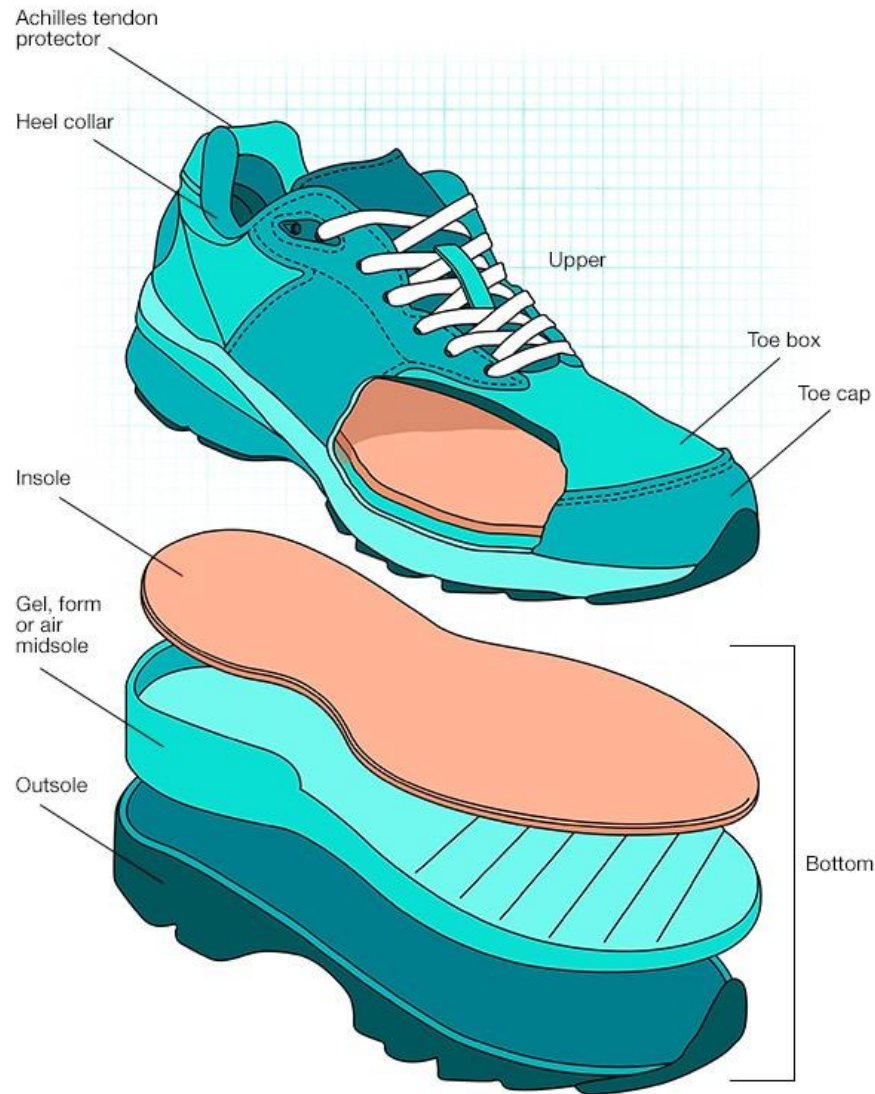
이미지 프로세싱

https://github.com/JSJeong-me/OpenCV_Practitioner_Guide_2/blob/main/counts_contours.ipynb

Vision Tasks

https://github.com/JSJeong-me/Vision_tasks

이로스타일 – Features of a shoe



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Achilles tendon protector. Reduces stress on the Achilles tendon by locking the shoe around the heel.

Heel collar. Cushions the ankle and ensures proper fit.

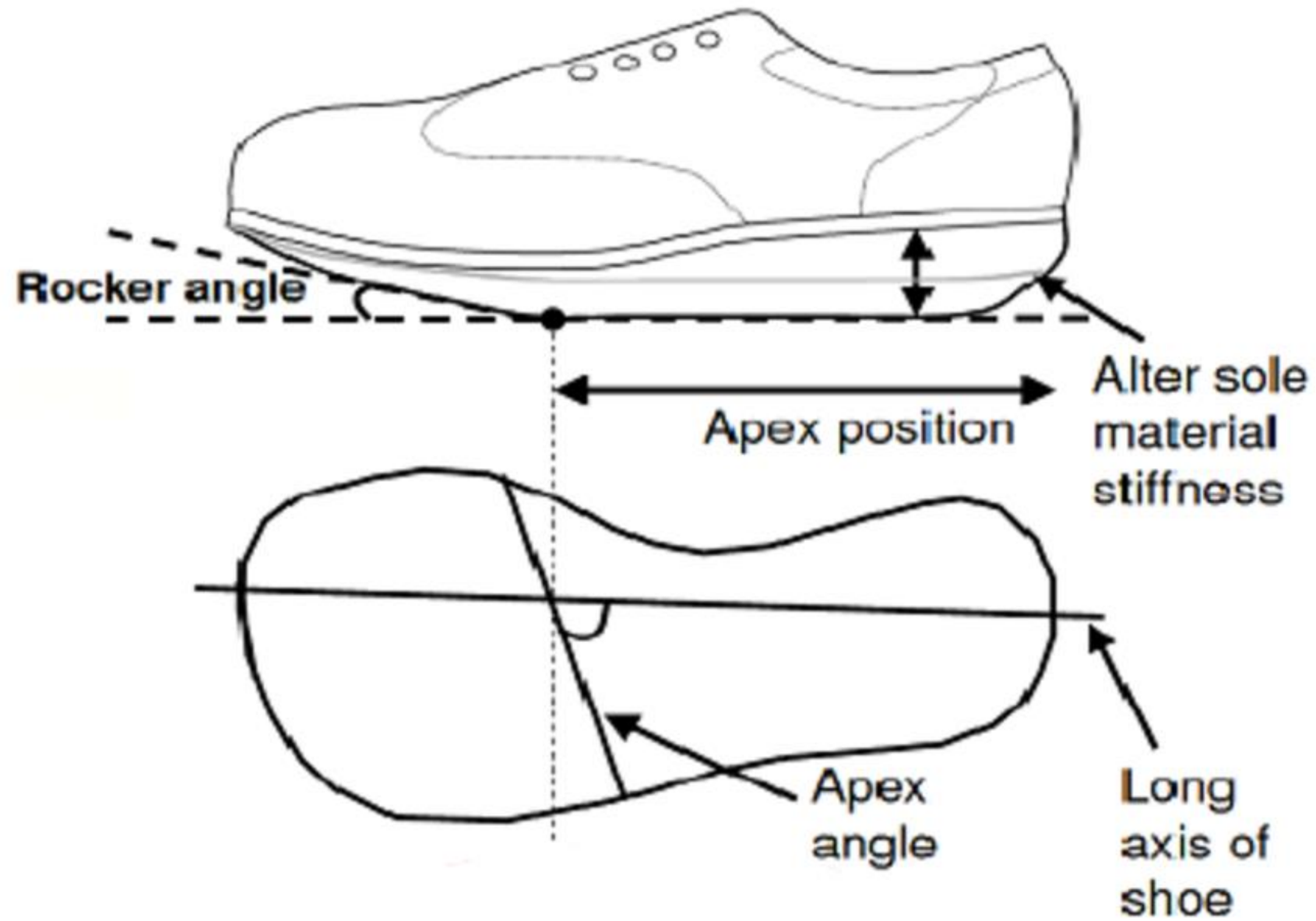
Upper. Holds the shoe on your foot and is usually made of leather, mesh or synthetic material. Mesh allows better ventilation and is lighter weight.

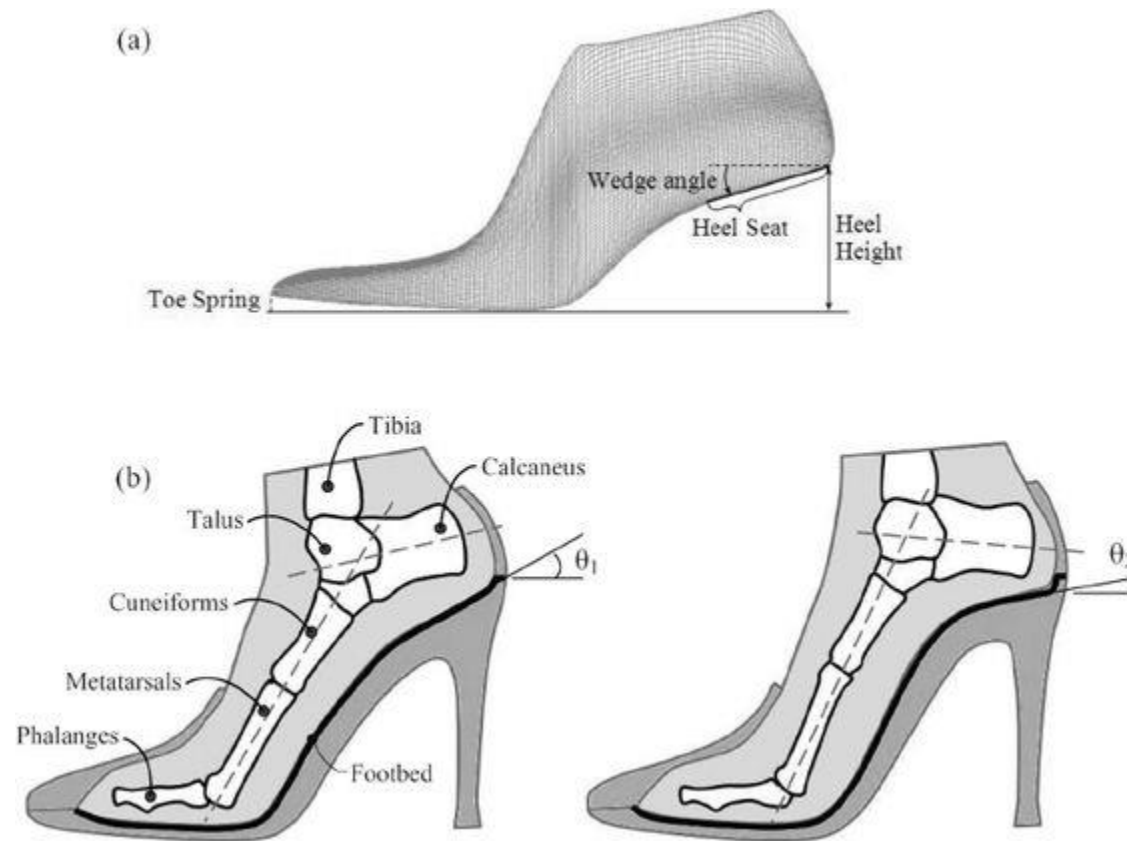
Insole. Cushions and supports your foot and arch. Removable insoles can be laundered or taken out to dry between walking sessions.

Gel, foam or air midsole. Helps cushion and reduce impact when your foot strikes the ground.

Outsole. Makes contact with the ground. Grooves and treads can help maintain traction.

Toe box. Provides space for the toes. A roomy and round toe box helps prevent calluses.



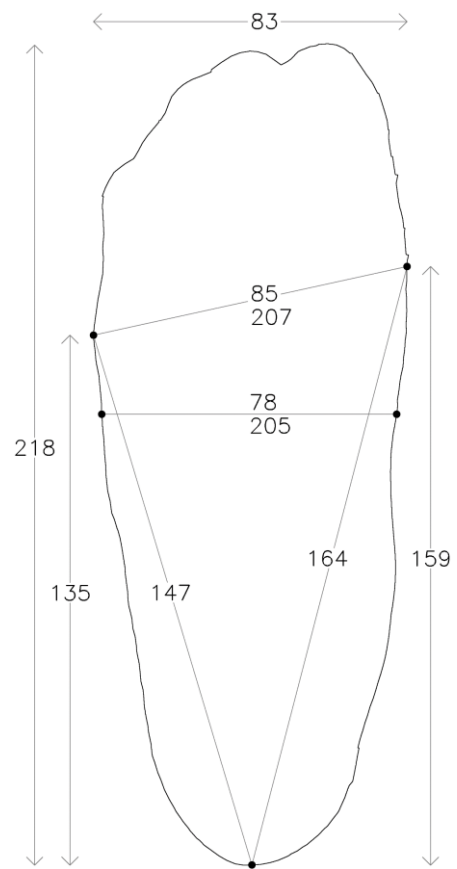
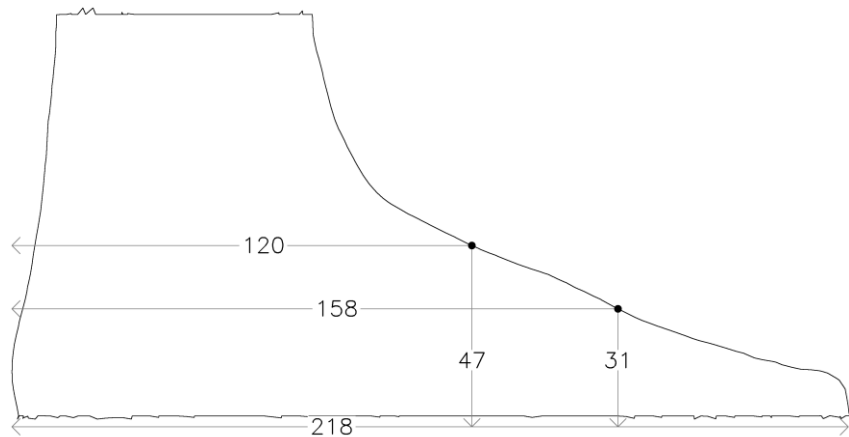


(a) Shoe-last characteristics that determine footbed shape; (b) two footbed shapes, which on left and right have the same heel height, heel seat length and toe spring but different wedge angles of θ_1 and θ_2 resulting in different foot postures.

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  "ankle_ver_girth": 219.333,  
  "ankle_length": 86.9369,  
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  "heel_to_outer_ball_distance": 146.896,  
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}
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}
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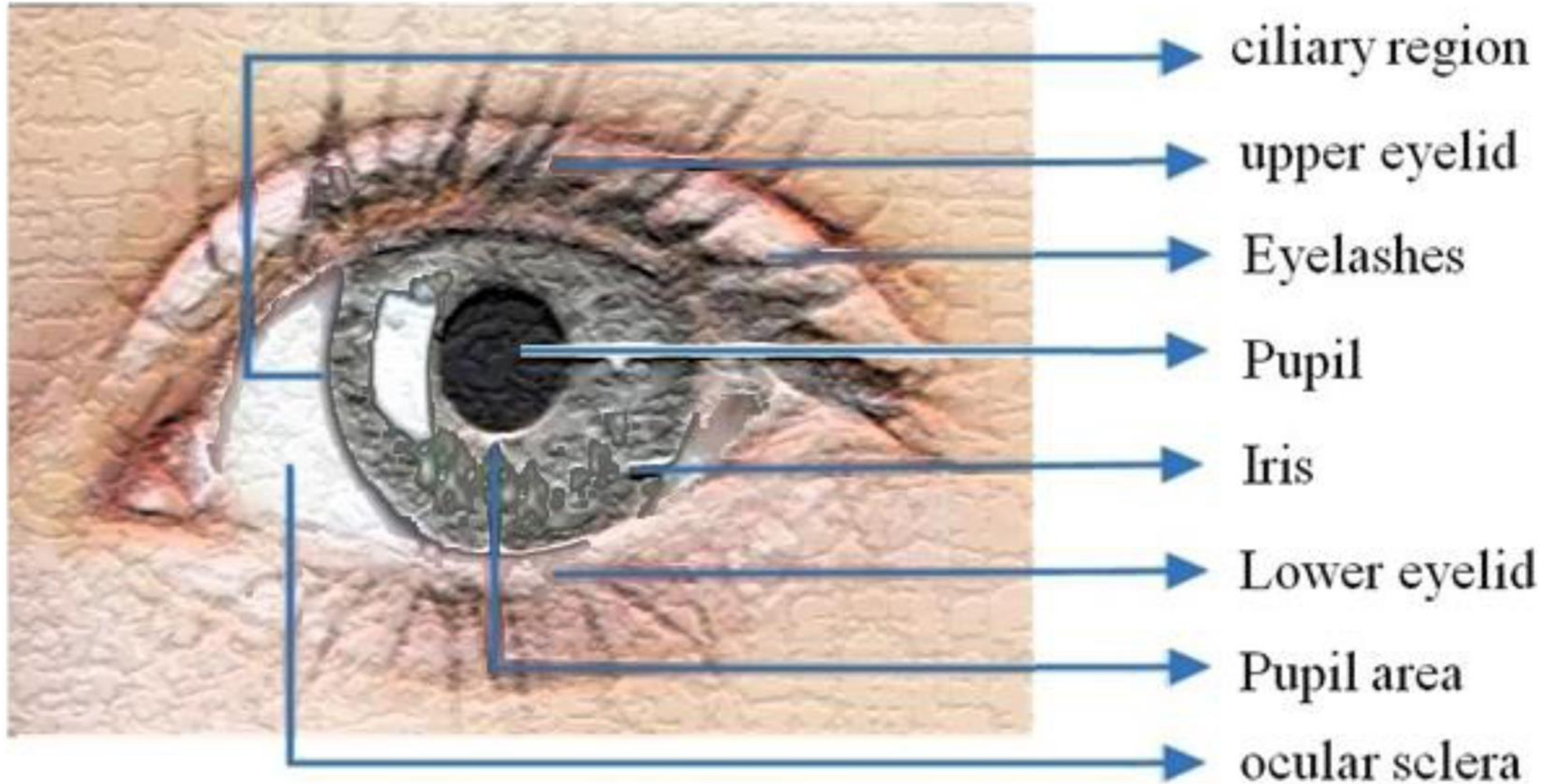
<https://jfootankleres.biomedcentral.com/articles/10.1186/1757-1146-7-3>

에이제이투 – Iris Classification

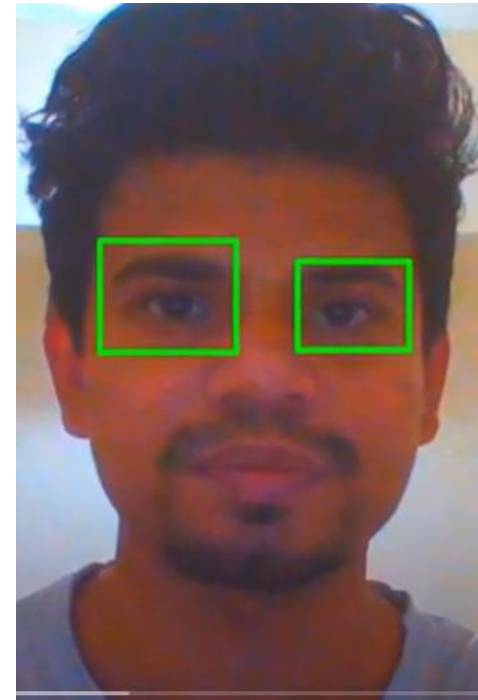
Deep Learnig을 이용한 홍채인식 과정

	AJ2	iris recognition
1	- 동영상 입력	
2	- 입력영상 Frame 처리	
3	- 동공탐지	
4	- 홍채이미지 추출	YOLO 학습
5	- 원본 이미지를 그레이스케일로 변환	
6	- 이미지 이진화	
7	- 동일한 픽셀값을 가지며 상호 연결된 영역을 동일한 그룹으로 분류하는 픽셀 그룹화	
8	- 물리적인 수치가 기준 범위 내에 속하는 영역을 동공 영역으로 결정하는 단계	
9	- 동공 영역의 위치를 기초로 상기 원본 이미지 상에서 홍채 영역을 특정하는 단계	
10	- 학습데이터 생성	
11	- 모델 생성	
12	- 모델 평가	
13	- TensorFlow Lite migration	

Deep Learnig 을 이용한 홍채인식 과정

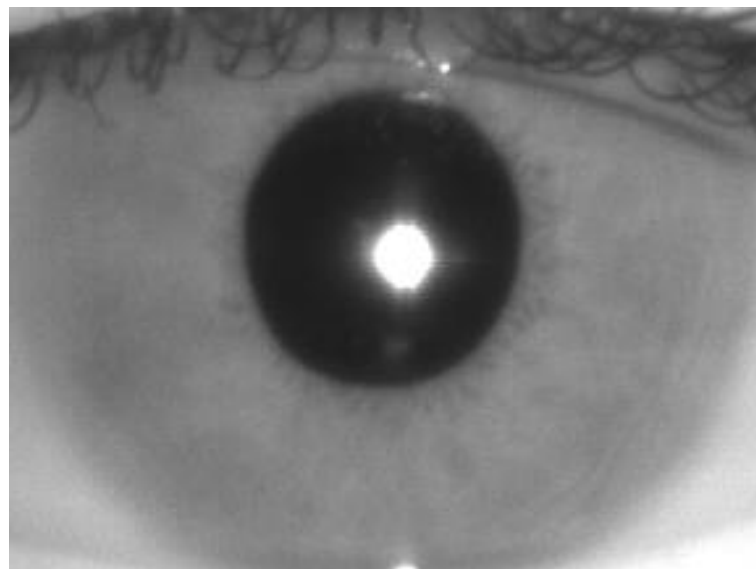
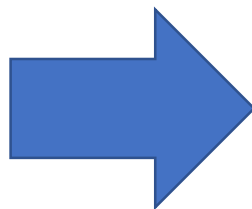


동영상 Frame 변환 및 동공탐지

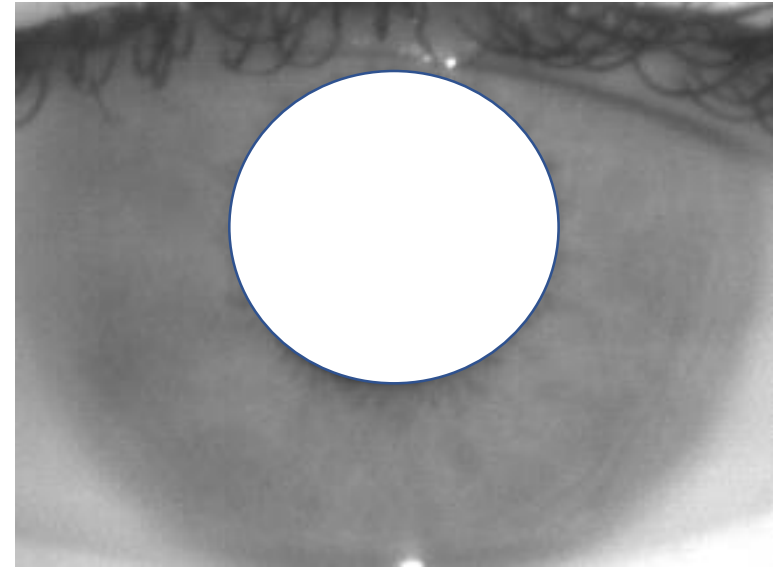
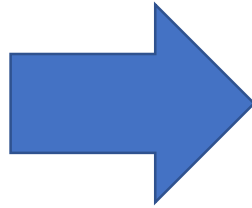
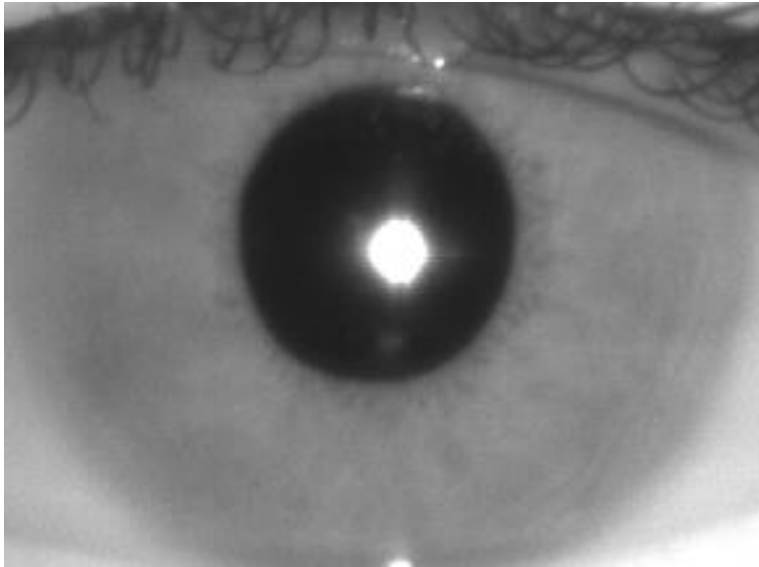


동공탐지

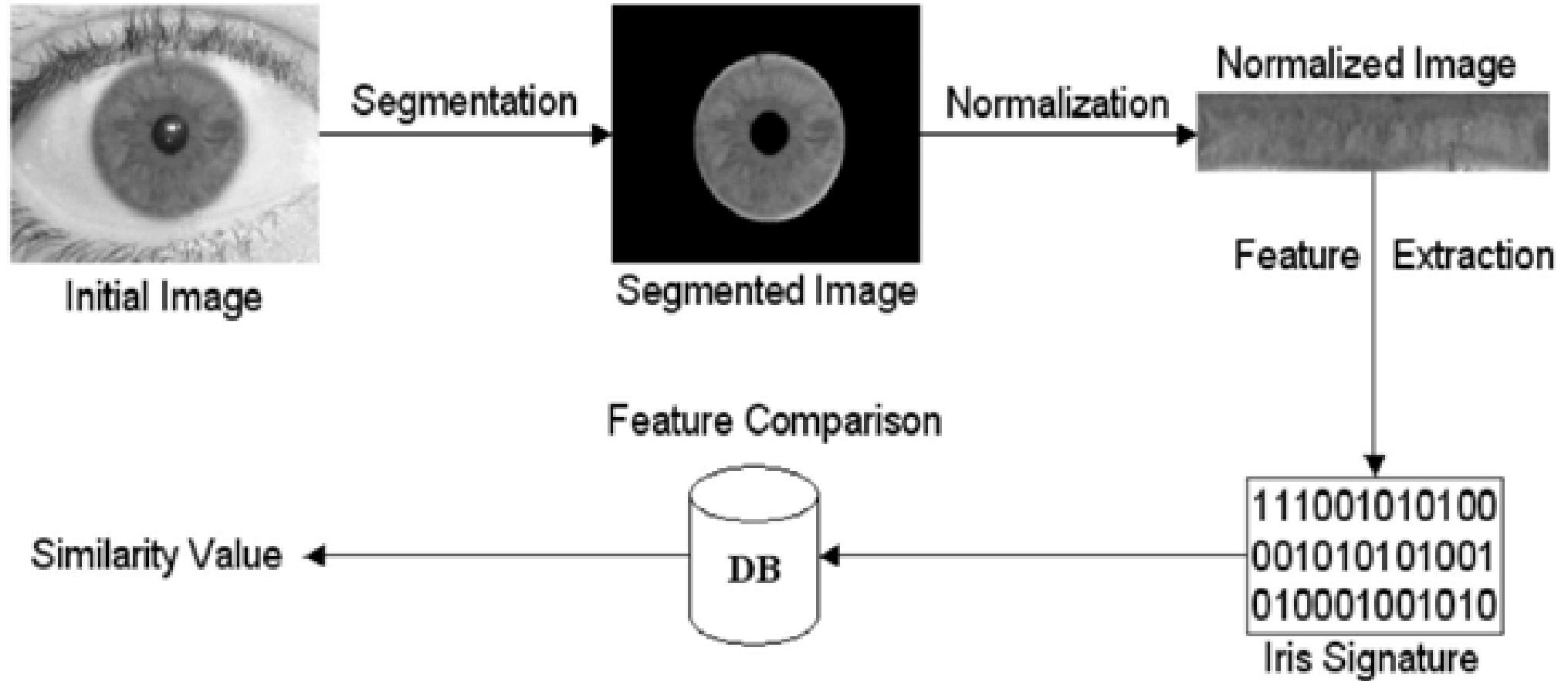
Iris 영역 찾기 및 Gray scale 변환



동공제거 및 Iris featuring



Iris Signature 학습 데이터 생성



CNN 모델 생성

https://github.com/JSJeong-me/Irostyle_consortium/blob/main/IrisClassification/0-IrisClassification.ipynb

CNN 모델 평가(Test Label: 100개)

https://github.com/thuyngch/Iris-Recognition/blob/master/CASIA1/1/001_1_1.jpg

CNN 모델 성능 개선 및 경량화(TensorFlow Lite)

<https://www.tensorflow.org/lite/guide?hl=ko>

RNX – Depth AI

Depth AI

alwaysai/spatial-ai-webinar-re x | alwaysAI - Home x | pi4-4 x | #support x | +


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📱 Apps ★ Bookmarks 🍷 Home 📁 Bayko 🌐 Google 📁 Arduino 📁 3d Printer 📁 Rocker-Bogie 📁 Sensors 📁 Make Robot Book » 📁 Other Bookmarks

Hostname: pi4-4
edgeIQ: v0.14.2
Status: Stopped

Output 📌

Model:
alwaysai/ssd_mobilenet_v2_coco_2018_03_29
Inference time: 0.688 s
Objects:
book : 78.9% Distance = 4.41m
cup : 71.5% Distance = 0.63m
cup : 68.4% Distance = 0.66m
chair : 67.1% Distance = 0.96m



cup : 68.37% cup : 71.49% book : 78.9%

🗨