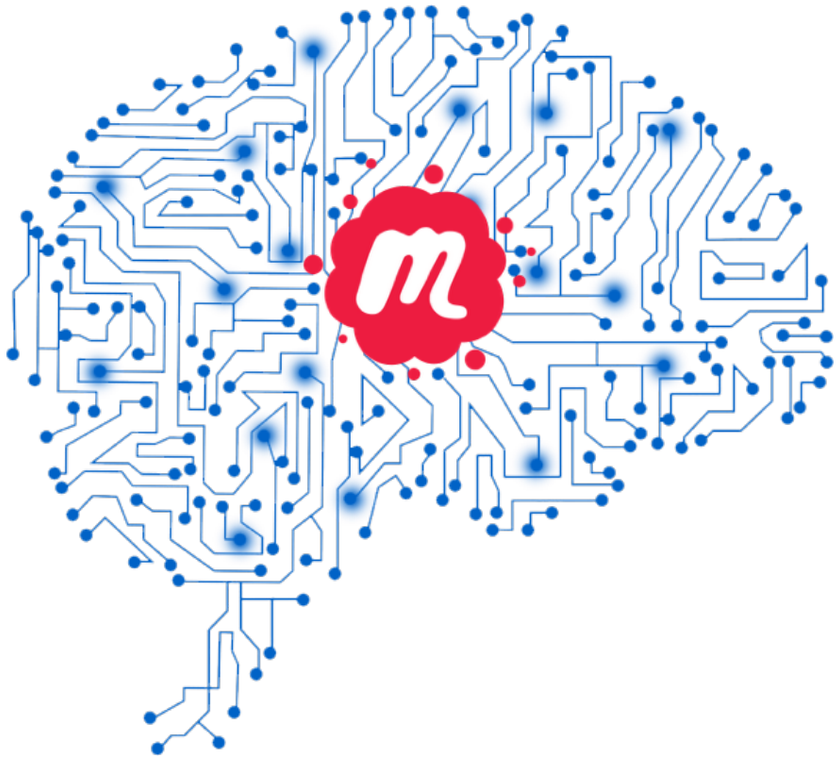
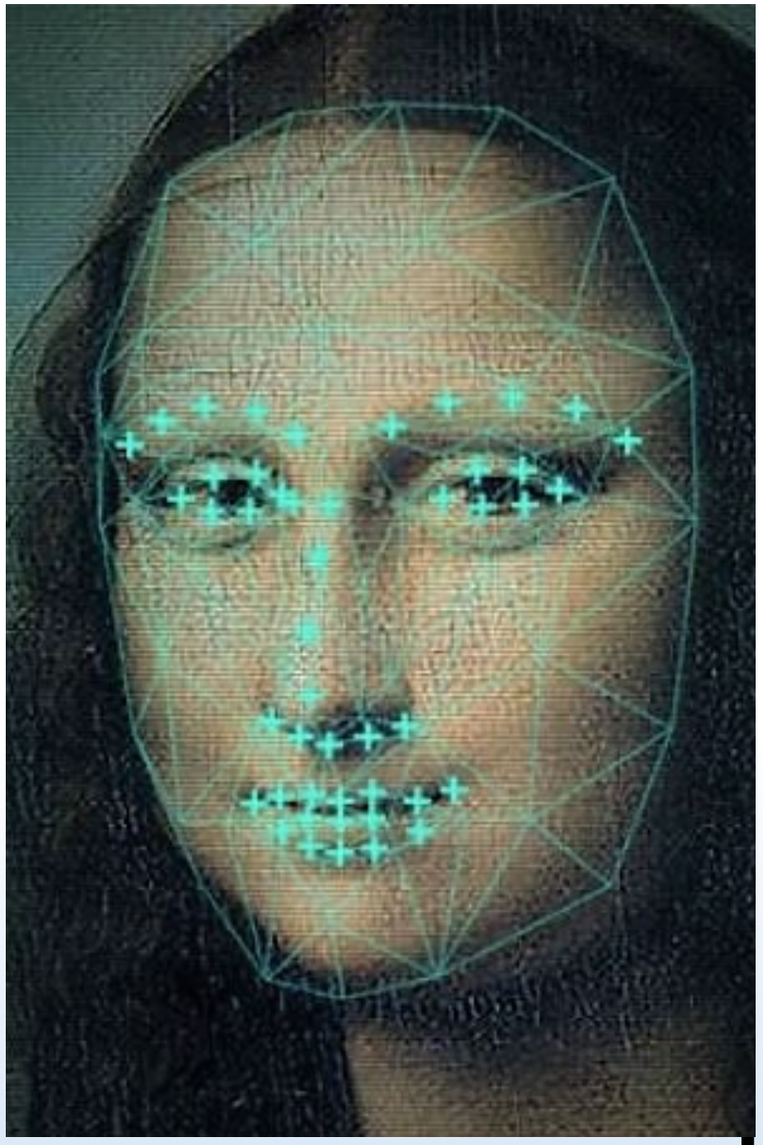
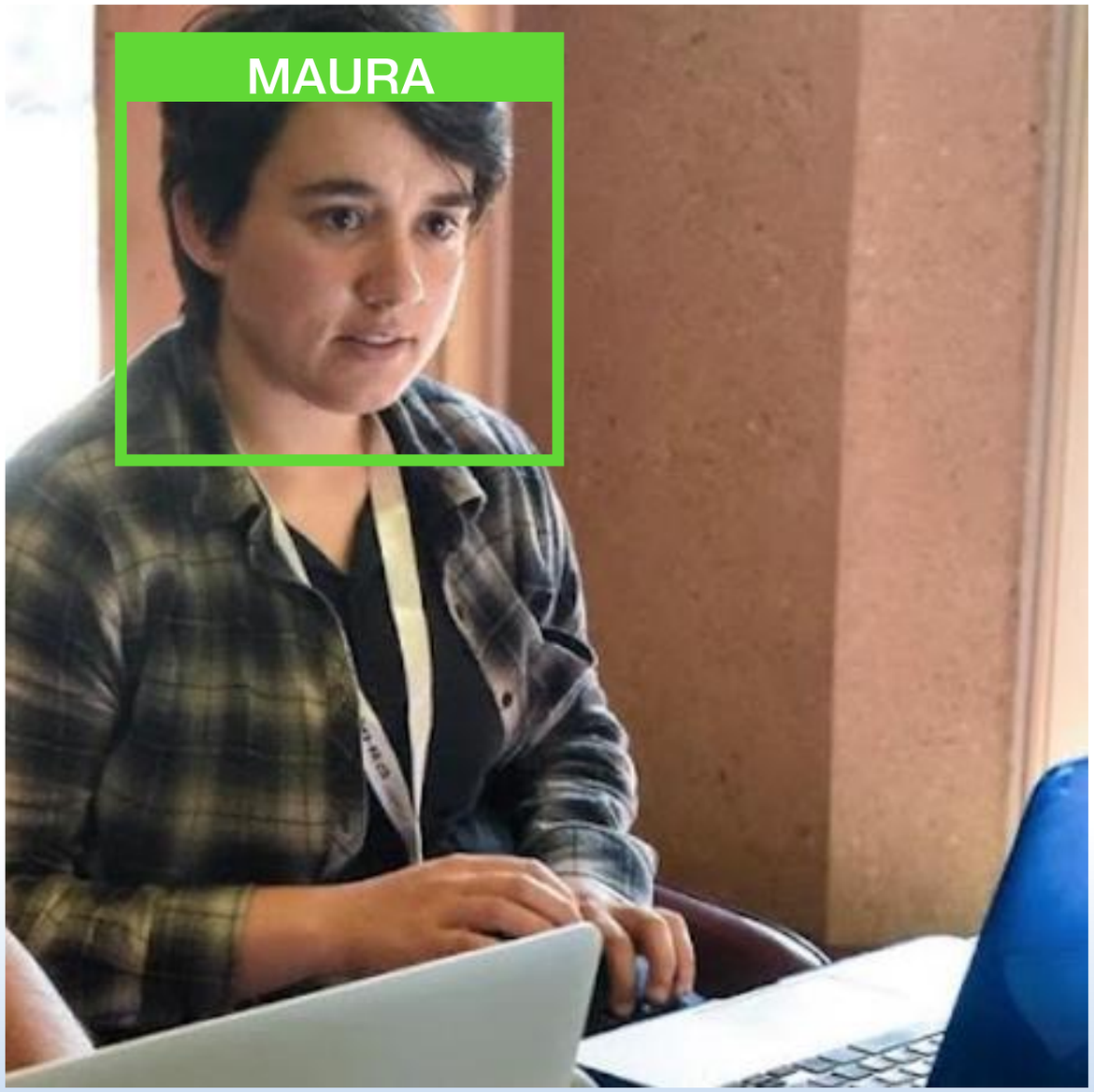




Deep Face Recognition

Maura Pintor

But first …



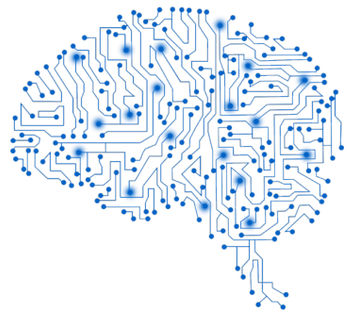
MAURA PINTOR

PhD Student PRALab

LM Ingegneria Telecomunicazioni

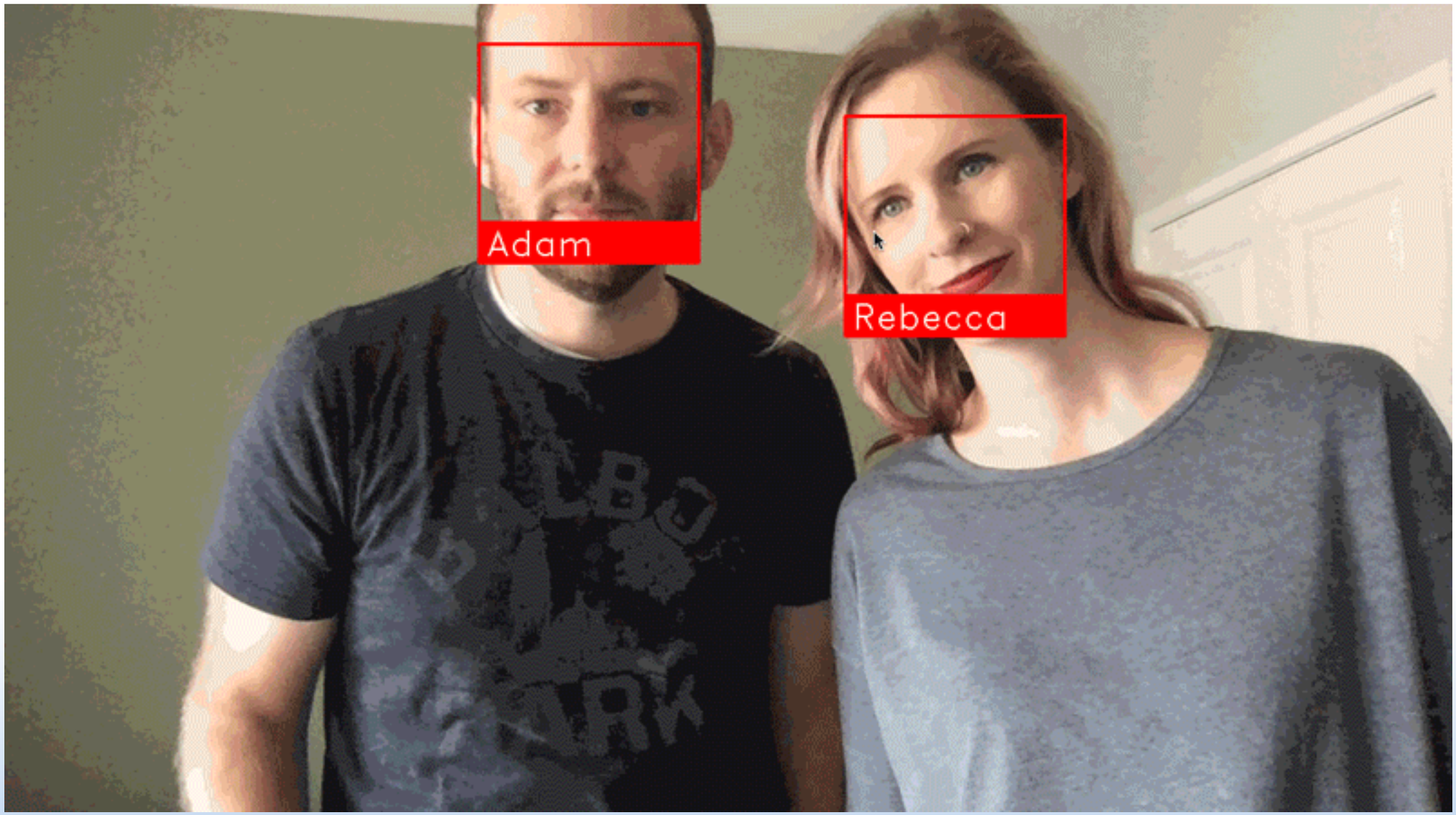
L Ingegneria Elettronica

Cosa faremo oggi

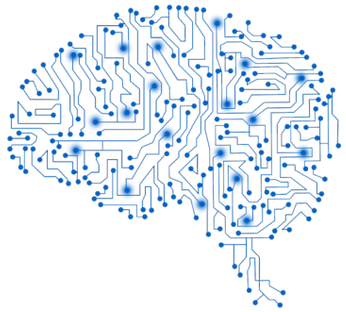


- Breve introduzione face recognition
- Introduzione al modello VGG Face
- Laboratorio

Face Recognition



Utilizzi del face recognition



Espressione

Etnia

Riconoscimento

Età

Genere

Tag Automatico

Identificazione

Credenziali

Person recognition

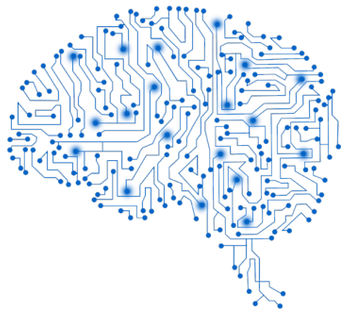
Style transfer

Face Filters

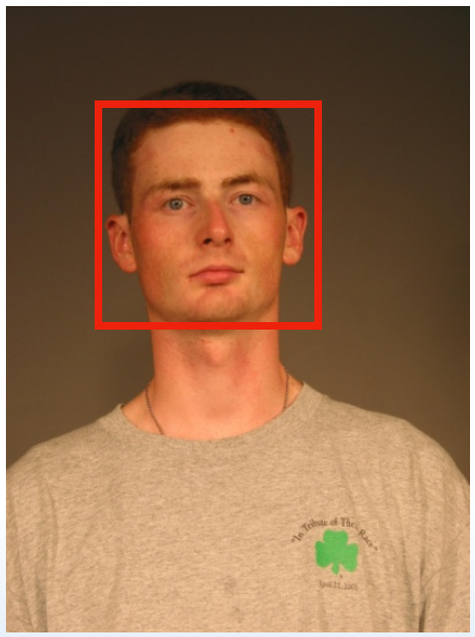
Svago

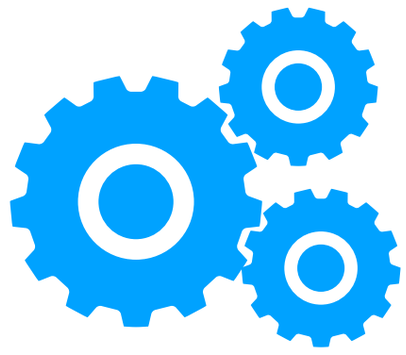
Sosia

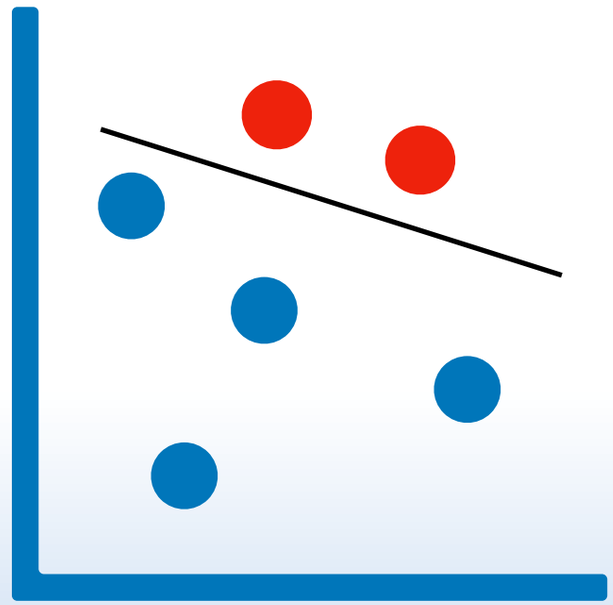
Face Recognition



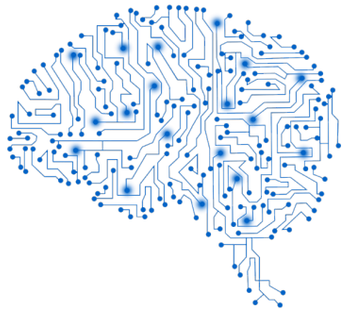
Prima



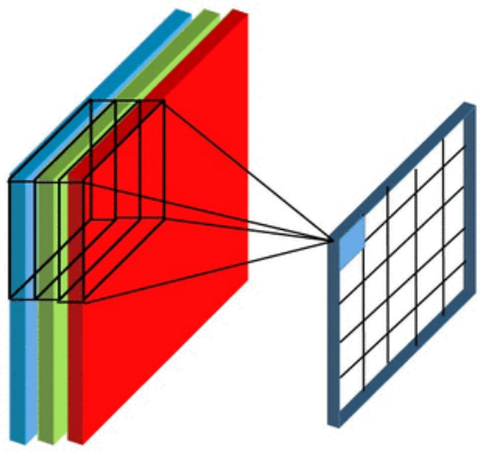


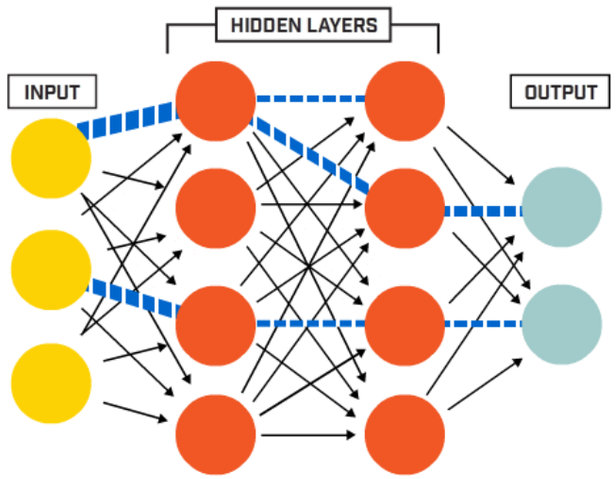


Face Recognition



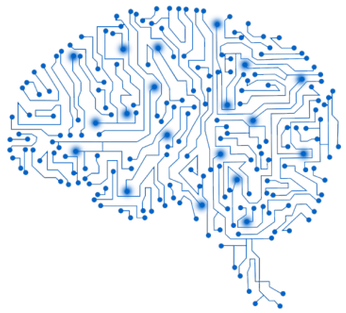
Ora





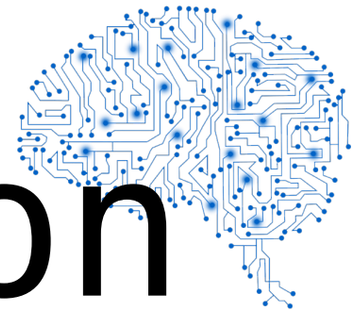
It's Mike!

Problematiche



- Cambia nel tempo
  - Rapidamente (posa, makeup, …)
  - Lentamente (età)
- Privacy
- Dati

Dataset Collection



Selezione candidati

- IMDB – rank by popularity
- Google Image Search
- Filtrate quelle con poche immagini sul Web
- Filtrate manualmente (omonimie, immagini scadenti)
- 2622 Identities

Raccolta immagini

- Altre immagini di ogni candidato
- Filtro automatico (solo immagini per cui è molto distinguibile – svm one-vs-all)
- Near duplicate removal
- Ulteriore filtraggio manuale

VGG Face

layer	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
type	input	conv	relu	conv	relu	mpool	conv	relu	conv	relu	mpool	conv	relu	conv	relu	conv	relu	mpool	conv
name	–	conv1_1	relu1_1	conv1_2	relu1_2	pool1	conv2_1	relu2_1	conv2_2	relu2_2	pool2	conv3_1	relu3_1	conv3_2	relu3_2	conv3_3	relu3_3	pool3	conv4_1
support	–	3	1	3	1	2	3	1	3	1	2	3	1	3	1	3	1	2	3
filt dim	–	3	–	64	–	–	64	–	128	–	–	128	–	256	–	256	–	–	256
num filts	–	64	–	64	–	–	128	–	128	–	–	256	–	256	–	256	–	–	512
stride	–	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	2	1
pad	–	1	0	1	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1

layer	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
type	relu	conv	relu	conv	relu	mpool	conv	relu	conv	relu	conv	relu	mpool	conv	relu	conv	relu	conv	softmx
name	relu4_1	conv4_2	relu4_2	conv4_3	relu4_3	pool4	conv5_1	relu5_1	conv5_2	relu5_2	conv5_3	relu5_3	pool5	fc6	relu6	fc7	relu7	fc8	prob
support	1	3	1	3	1	2	3	1	3	1	3	1	2	7	1	1	1	1	1
filt dim	–	512	–	512	–	–	512	–	512	–	512	–	–	512	–	4096	–	4096	–
num filts	–	512	–	512	–	–	512	–	512	–	512	–	–	4096	–	4096	–	2622	–
stride	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1
pad	0	1	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0

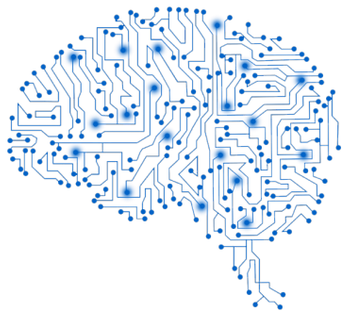
Visual Geometry Group

VGG Face 1

VGG Face 2

Parkhi, Omkar M., Andrea Vedaldi, e Andrew Zisserman. «Deep Face Recognition». In *Procedings of the British Machine Vision Conference 2015*, 41.1-41.12. Swansea: British Machine Vision Association, 2015. https://doi.org/10.5244/C.29.41.

Altri Modelli



Google:

Schroff, Florian, Dmitry Kalenichenko, e James Philbin. «FaceNet: A Unified Embedding for Face Recognition and Clustering». *2015 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, giugno 2015, 815–23. https://doi.org/10.1109/CVPR.2015.7298682.

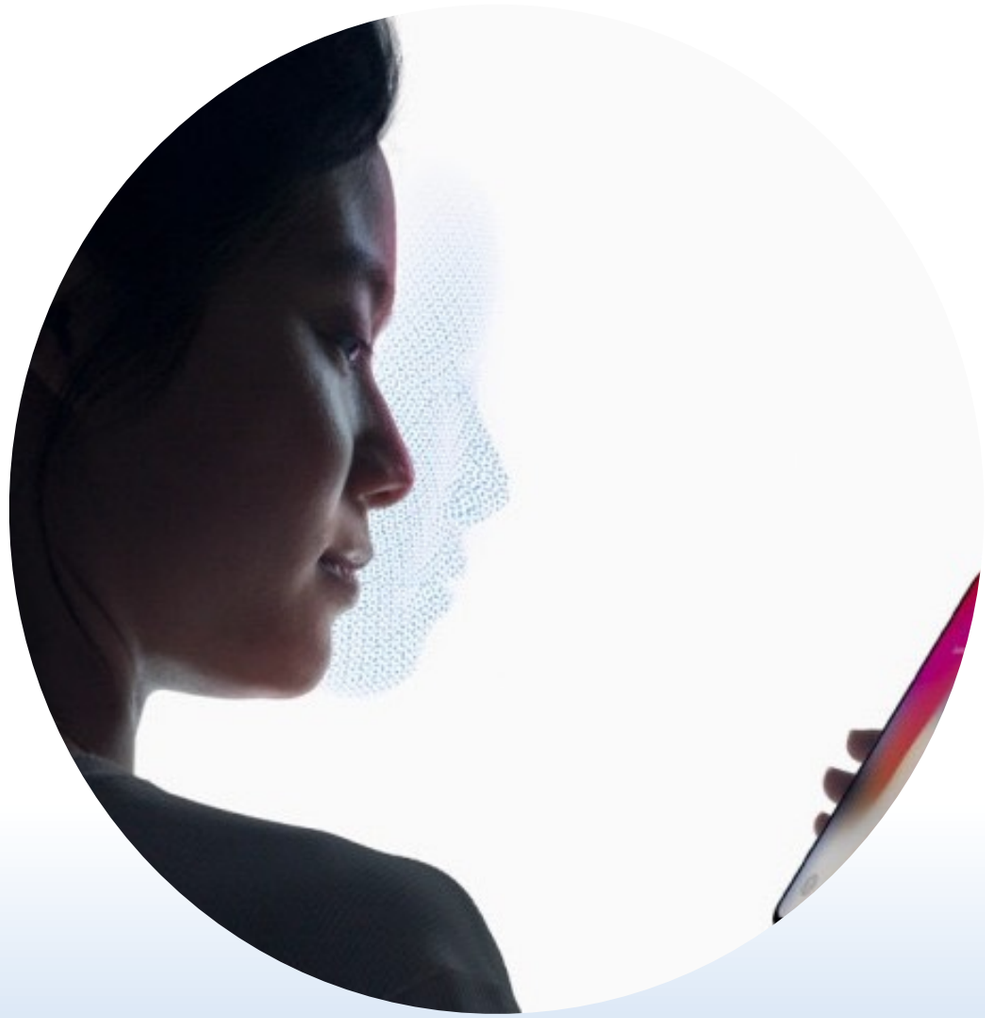
Facebook:

Taigman, Yaniv, Ming Yang, Marc'Aurelio Ranzato, e Lior Wolf. «DeepFace: Closing the Gap to Human-Level Performance in Face Verification». In *2014 IEEE Conference on Computer Vision and Pattern Recognition*, 1701–8. Columbus, OH, USA: IEEE, 2014. https://doi.org/10.1109/CVPR.2014.220.

Face Recognition

Apple Face ID

Sistema di identificazione biometrica successore di Touch ID



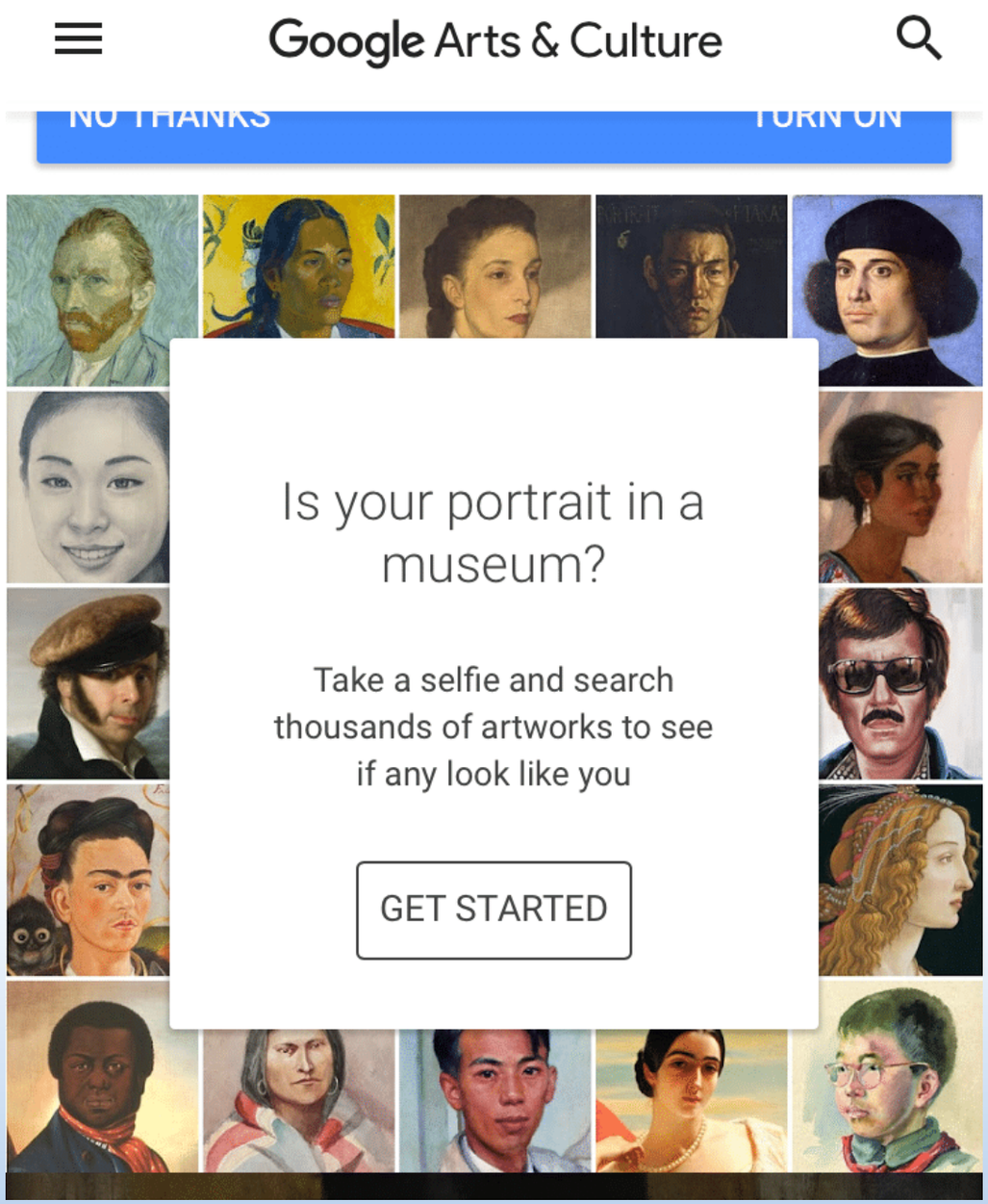
Face ID has a facial recognition sensor that consists of two parts: a "Romeo" module that projects more than 30,000 infrared dots onto the user's face, and a "Juliet" module that reads the pattern.

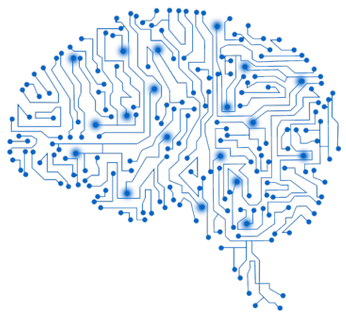
The technology learns from changes in a user's appearance, and therefore works with hats, scarves, glasses and many sunglasses, beard and makeup

Face Recognition

Google Arts And Culture

Art Selfie





Time to code!

Maura Pintor

drive folder col modello: goo.gl/DkTGvi
(disponibile fino al 10 Dicembre)