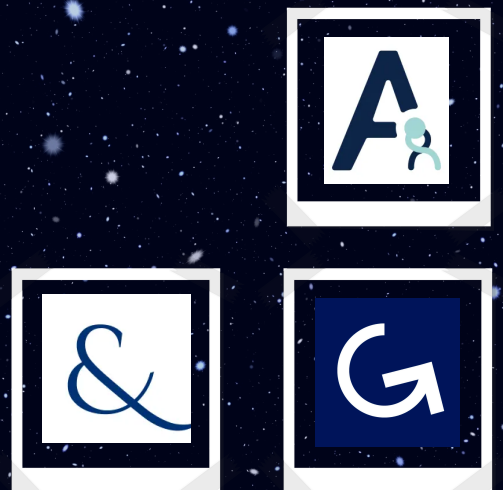




Astra Bocconi

# Stella Polare

October 2024





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Alberto Insardà



WRITTEN BY:  
RICCARDO MOGGIO



# COSA SIGNIFICA ESSERE ITALIANI TRA IUS SCHOLAE E REFERENDUM

La proposta di Forza Italia è pronta. Il partito facente parte della coalizione di maggioranza ha annunciato, nei giorni scorsi, che è ormai prossimo a presentare alla Camera una proposta di legge che intende modificare la Legge n. 91 del 5 febbraio 1992, relativa all'acquisto della cittadinanza italiana. Dalle parole del leader del partito Antonio Tajani e del capogruppo in Commissione Affari Costituzionali Paolo Emilio Russo si evincono i tre punti cardine su cui FI intende concentrarsi: riconoscimento della cittadinanza per tutti coloro che hanno seguito il ciclo completo della scuola dell'obbligo, stretta sulla possibilità di richiedere la cittadinanza in base allo ius sanguinis, riducendola a due generazioni, e semplificazione delle procedure, con particolare riguardo ai tempi di risposta da parte dello Stato. Tale annuncio pone sotto i riflettori un dibattito sempre aperto, quello relativo ai metodi di attribuzione della cittadinanza a chi risiede in Italia pur non essendo italiano. Al di là di valutazioni di mera opportunità politica, che spesso influenzano tale dibattito, questo articolo si pone l'obiettivo di presentare l'attuale situazione italiana in merito all'acquisto della cittadinanza, e le possibili conseguenze in caso di modificazione della Legge 91/1992.

## La disciplina attuale

Partiamo con un'analisi dell'attuale situazione in Italia. Come detto, la legge che disciplina l'acquisto della cittadinanza italiana è la n. 91 del 5 febbraio 1992. All'articolo 1, tale normativa prevede che acquisti ex lege per nascita la cittadinanza italiana:

- <<Il figlio di padre o di madre cittadini>>
- <<Chi è nato nel territorio della Repubblica se entrambi i genitori sono ignoti o apolidi, ovvero se il figlio non segue la cittadinanza dei genitori secondo la legge dello Stato al quale questi appartengono>>
- <<Il figlio di ignoti trovato nel territorio della Repubblica, se non venga provato il possesso di altra cittadinanza>>



Il riconoscimento della cittadinanza italiana avviene anche a vantaggio degli stranieri discendenti da avo italiano, emigrato in Paesi ove vige lo *ius soli* (e dove quindi il discendente da avo italiano acquista la cittadinanza del Paese in cui nasce). L'interessato deve dimostrare la discendenza da avo originariamente cittadino italiano e l'assenza di interruzione nella trasmissione della cittadinanza (ossia mancata naturalizzazione straniera dell'avo dante causa prima della nascita del figlio, mancanza di dichiarazioni di rinuncia alla cittadinanza da parte degli ulteriori discendenti prima della nascita della successiva generazione).

Quanto appena descritto rappresenta il cosiddetto principio dello *ius sanguinis*, secondo il quale la cittadinanza si ottiene per discendenza o filiazione. Applicazione di questo principio è la regola per cui, nel caso in cui un soggetto dovesse acquistare o riacquistare la cittadinanza italiana, il figlio minore acquista direttamente la cittadinanza, purché conviva col genitore alla data dell'acquisto/riacquisto della cittadinanza e tale convivenza sia stabile ed effettiva, opportunamente attestata con idonea documentazione. Si badi poi che l'adozione di figlio minore è oggi equiparata all'ipotesi di filiazione.

È poi importante sottolineare come, ai sensi dell'articolo 4 comma 2 della suddetta legge, «Lo straniero nato in Italia, che vi abbia risieduto legalmente senza interruzioni fino al raggiungimento della maggiore età, diviene cittadino se dichiara di voler acquistare la cittadinanza italiana entro un anno dalla suddetta data». Nel momento del compimento del diciottesimo anno di età, cioè, lo straniero nato in Italia può, entro il compimento del diciannovesimo anno, richiedere la cittadinanza.

Questa previsione non va tuttavia confusa come un caso di *ius soli*: con questo termine si indica l'acquisto per nascita della cittadinanza, sulla base del Paese di nascita (e non della cittadinanza dei genitori). Tale principio è vigente in numerosi Paesi americani, primi tra tutti gli Stati Uniti, mentre in Europa non è particolarmente diffuso. Sicuramente non trova applicazione nell'articolo 4 comma 2 della Legge 91/1992, che prevede invece un'ipotesi di riconoscimento della cittadinanza, su richiesta dell'interessato e solo dopo diciotto anni di residenza ininterrotta.

Similmente, sono previsti dal nostro ordinamento anche casi di naturalizzazione: ipotesi in cui il cittadino straniero in possesso di determinati requisiti faccia richiesta della cittadinanza italiana. Ad oggi, le ipotesi di naturalizzazione sono più di una, e richiedono alternativamente, come requisito, una permanenza sul territorio della Repubblica di almeno:

- **Dieci** anni per gli stranieri che non siano cittadini di uno Stato UE;
- **Quattro** anni per i cittadini di uno Stato membro dell'Unione Europea;
- **Tre** anni, per lo straniero che è nato nel territorio della Repubblica o il cui padre, la madre o i nonni, sono stati cittadini italiani per nascita;
- **Cinque** anni successivi all'adozione, per lo straniero maggiorenne adottato da cittadino italiano;
- **Cinque** anni per l'apolide, con decorrenza dal riconoscimento del relativo status.

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Insieme a uno di questi requisiti è poi richiesta una conoscenza di livello B1 della lingua italiana, un reddito minimo annuo (che varia a seconda della presenza o meno di un nucleo familiare a carico del richiedente) e l'assenza di condanne penali e di pericolosità sociale.

La cittadinanza può acquistarsi anche per matrimonio con cittadino italiano. In base all'articolo 5, comma 1, della Legge 91/92 il coniuge, straniero o apolide, di cittadino italiano può acquistare la cittadinanza italiana <<quando, dopo il matrimonio, risiede legalmente da almeno due anni nel territorio della Repubblica, oppure dopo tre anni dalla data del matrimonio se residente all'estero, qualora non sia separato o divorziato.

I predetti termini sono ridotti della metà in presenza di figli nati o adottati dai coniugi>>.

Infine, come ultimo caso, la cittadinanza può essere concessa allo straniero, quando questi abbia reso eminenti servizi all'Italia, ovvero quando ricorra un eccezionale interesse dello Stato.



Cosa significa essere cittadino italiano?

Prima di proseguire, è bene chiarire cosa significa essere cittadini italiani e cosa ciò comporta.

La cittadinanza può essere intesa come uno status giuridico, ovverosia un fascio di posizioni giuridiche, attive e passive (diritti e doveri), riconosciute all'individuo in ragione della sua appartenenza a una determinata comunità politica. Da un'altra prospettiva, si può intendere la cittadinanza come un legame di appartenenza dell'individuo a una determinata comunità politica, a prescindere dai diritti e dai doveri che il cittadino potrà professare.

Dal punto di vista politico, essere cittadino significa poter essere elettore sia attivo che passivo, nonché aderire a quegli strumenti partecipativi previsti a tutela del cittadino, quali il referendum, o la petizione popolare.

Infine, la cittadinanza riconosce la possibilità per la persona interessata di ottenere le prestazioni assistenziali garantite dallo Stato, quali la malattia, la pensione di vecchiaia, i sussidi per la disoccupazione, il reddito di cittadinanza e quant'altro.

Da specificare, infine, che acquisire la cittadinanza italiana comporterebbe automaticamente l'acquisizione di un altro status veramente importante: quello di cittadino europeo. La cittadinanza europea è una cittadinanza indipendente da quella nazionale, che viene assegnata a tutti i cittadini di Paesi UE: comporta, tra l'altro, il diritto di libero movimento all'interno dell'Unione, e conferisce la qualifica di elettore passivo e attivo sia alle elezioni del Parlamento europeo, che alle elezioni amministrative del comune di residenza del cittadino europeo (anche questa è in uno Stato diverso rispetto a quello di cui ha la nazionalità).

### Le possibili proposte...

Quali sono dunque i modelli di acquisto della cittadinanza che potrebbero essere implementati nel nostro ordinamento?

Lo ius soli, di cui già si è detto, prevede la concessione automatica della cittadinanza a chi nasce sul territorio nazionale. In realtà, nessuna proposta di legge in Italia ha mai considerato un diritto così ampio. Tra i paesi che adottano lo ius soli ci sono gli Stati Uniti e la Francia; in quest'ultimo Paese è però richiesto che i genitori del minore abbiano già un permesso di soggiorno.

Una proposta di legge è stata invece presentata, dal deputato del Movimento 5 Stelle Giuseppe Brescia nel 2022, per ottenere l'approvazione del cosiddetto ius scholae: tale proposta mirava a concedere la cittadinanza italiana ai minori stranieri nati in Italia o arrivati entro i 12 anni, dopo aver completato un ciclo scolastico di almeno cinque anni. Secondo alcune stime, questo avrebbe potuto rendere immediatamente italiani circa 135.000 studenti già presenti nel paese. Nonostante un ampio sostegno, la proposta però non è andata avanti dopo il cambio di legislatura. Simile allo ius scholae era il cosiddetto ius culturae, parte di un disegno di legge approvato nel 2015, che vedeva unite 25 differenti proposte. Anche questo progetto si è arenato dopo le elezioni.



### ...e quella attuale di FI

Ciò detto, possiamo provare ad analizzare la proposta che Forza Italia ha avanzato in questi giorni. Partiamo col dire che il Vicepresidente del Consiglio dei ministri Antonio Tajani ha parlato di questo progetto di legge riferendosi ad esso con l'espressione di *Ius Italiae*. Tale definizione è stata probabilmente coniata per evitare di associarla a quella presentata due anni fa dal Movimento 5 Stelle.

Nei contenuti, tuttavia, la proposta pare abbracciare l'idea di introdurre uno ius scholae a tutti gli effetti: si parla infatti di concedere la cittadinanza a quegli stranieri, nati in Italia o arrivati non dopo i cinque anni di età, che hanno concluso un ciclo di dieci anni di scuola dell'obbligo: cinque di elementari, tre di medie e due di superiori.

Inoltre, il disegno di legge dovrebbe include una restrizione a due generazioni degli antenati italiani grazie ai quali gli stranieri possono acquisire la cittadinanza per discendenza (principio dello ius sanguinis).

Per finire, sarebbe prevista la riduzione da tre a un anno del periodo in cui lo Stato deve o può rispondere alle richieste di cittadinanza. La notizia di un'apertura di Forza Italia alla possibilità di estendere la cittadinanza a più residenti sul suolo italico ha suscitato una reazione avversa da parte dei partiti alleati nella coalizione, Fratelli d'Italia e Lega. Lucio Malan, capogruppo di FdI al Senato, ha sottolineato che non vi è un'opposizione netta alla proposta, ma piuttosto un'apertura al confronto, purché vengano mantenuti alcuni principi fondamentali. «Mi sembra giusta anche la parte in cui si mette un limite al diritto di avere la cittadinanza italiana se discendenti da italiani: il legame dev'essere reale», ha aggiunto Malan, segnalando che ogni riforma dovrà rispettare i legami effettivi con l'Italia.

### Quale strada seguire?

Alla luce di tali dati, una prima impressione è che, anche senza aumentare le casistiche in cui un residente non italiano possa fare richiesta per la cittadinanza, l'Italia dia già la possibilità a molti stranieri di diventare cittadini. In effetti, la legge del '92 prevede molteplici casistiche di naturalizzazione e di riconoscimento della cittadinanza.

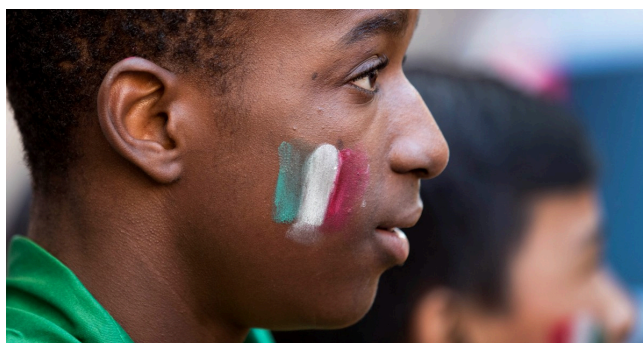
Il quesito referendario, da un lato, non introdurrebbe un'ipotesi nuova di naturalizzazione: questa è già concessa in base a un periodo di residenza continuativo, che semplicemente verrebbe ridotto da 10 a 5 anni. Dall'altro lato, la proposta di FI intende introdurre un'ipotesi diversa da quelle preesistenti di concessione della cittadinanza, e particolarmente dirimente: permetterebbe a stranieri, anche non nati in Italia, di diventare italiani addirittura prima del compimento della maggiore età.

Per valutare l'opportunità di tali proposte e simili, è bene tenere a mente due temi fondamentali: che significato si vuole attribuire alla cittadinanza, e per che ragione si intende concederla.

Questi due aspetti vanno di pari passo: si può identificare il concetto di cittadinanza come sinonimo di identità culturale, di condivisione di valori, di popolo legato a un determinato territorio. Di conseguenza, ha senso riconoscere come cittadino italiano un qualsiasi straniero, che possa considerarsi pienamente integrato a livello sociale, prima che politico, nella comunità. Questa è l'idea contenuta nelle parole di Antonio Tajani, quando parla di *lus italiae*: chi compie un ciclo di dieci anni di scuola in Italia «diventa italiano perché si è formato come un italiano».

Diverso è invece considerare la cittadinanza prima di tutto sul piano politico, e realizzare un binomio cittadini – elettori che rischia di far perdere di vista il vero significato di questo concetto. Se si segue questa interpretazione, concedere o meno la cittadinanza a più soggetti diventa una valutazione di opportunità politica, relativa ai mutamenti che ciò potrebbe comportare nel corpo elettorale e alle conseguenze sul piano delle prestazioni assistenziali garantite (basti pensare che l'approvazione del suddetto referendum porterebbe 2,5 milioni di persone a poter fare richiesta di cittadinanza).

Certamente queste sono considerazioni che hanno un risvolto pratico notevole e sono da tenere in conto, ma non devono far dimenticare il significato più profondo dell'essere cittadino di un Paese. Bilanciare questi interessi non è una strada semplice, ma è l'unica da seguire se non si vuole trasformare la cittadinanza in un mero strumento di campagna elettorale.



(per esigenze di impaginazione questo articolo è stato ridotto, per la versione integrale si rimanda al sito dell'associazione <https://www.advocacyandlitigation.com>)



WRITTEN BY:  
**LAURA MIRELLA CORBELLA**



# INSIDE THE DRAGHI'S REPORT

## REALISM MEETS VISION

Last year, as the EU struggled with soaring inflation and stagnant growth, Ursula Von Der Leyen commissioned former ECB President Mario Draghi to write a report on how the EU can regain its competitive edge. On 9th September 2024, the long-awaited report "The future of European Competitiveness" was released, right before the Commission composition for the next five years was proposed. The document has the potential to serve as the blueprint for its mandate.

### Did the report live up to the expectations?

Although the report provided valuable insights that we will dive into, it also incited controversy. Critics complained that Draghi's team failed to consult any Central and Eastern European personality, and only 5% of the contributions was proposed by civil society and trade unions, raising concerns about diversity and representation.

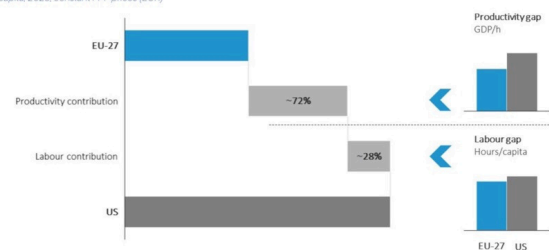
The report's main takeaway is that the EU would need an exorbitant amount of additional investments every year to tackle current threats and compete with the US and China from an economic standpoint. Draghi uses the US as a benchmark throughout all his analyses, nudging the EU towards American growth and productivity levels, whilst ensuring the survival of European social welfare.

Since national governments alone cannot possess sufficient financial capacity, Draghi advocates for increased cooperation and joint borrowing at the EU level, reigniting the discussion about the extent to which Europe should be federalised.

### The problem: weak productivity

The report begins by outlining Europe's primary issue, which is stagnant productivity: even if GDP growth is maintained, it is not enough to guarantee a strong market position. By most metrics, European productivity has barely increased since the 2008 financial crisis and it is now lagging well-behind that of the US. The report shows that 72% of the EU's GDP-per-capita gap with the US over the past 15 years can be attributed to differences in productivity. For the past 15 years, the EU has underestimated this productivity crisis by relying on high immigration rates, which contributed to positive growth and balanced demographics, while global demand for European exports compensated for the weak domestic one.

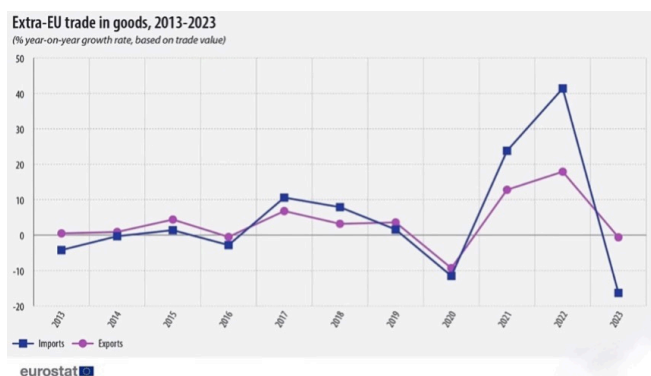
FIGURE 4  
GDP per capita gap  
GDP per capita, 2023, constant PPP prices (EUR)



Source: AMECO, 2024



However, Europe cannot ignore its slowdown, especially as public opposition to migration and low birth rates is growing, worsening demographic overview and straining national economies. In addition, an increasingly fragmented global economy creates new risks for European supply chains, challenging markets even more.



## Proposed solutions

To remedy all of these problems Draghi examines three transformations.

### 1. Boosting productivity

The first transformation focuses on improving European productivity by accelerating innovation and creating new growth engines. Draghi emphasizes that Europe has lost ground by concentrating on mature technologies, disregarding the potential of emerging technologies like software and artificial intelligence. By contrast, the US has created from scratch numerous companies with a market capitalization exceeding \$100 billion, something Europe has failed to do in the last 50 years.

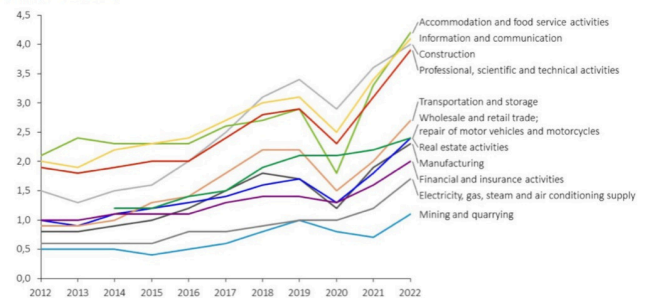
Draghi attributes this innovation deficit to EU red tape and insufficient market integration that need to be rectified through streamlined regulations.

He stresses that Europe should emulate the US in terms of productivity and innovation, but without the drawbacks of the US social model. He also stresses the importance of confronting skills shortages, particularly in fields of technological innovation and decarbonisation. Europe excels at producing top talent in STEM, but needs to scale up its efforts and come up with a robust upskilling agenda to meet future demands.

### 2. Decarbonization

The second transformation is centered on a joint EU decarbonization plan. Draghi reveals that Europe’s energy prices are two to three times higher than those in the US, creating a structural challenge for European industry. In order to reduce these costs in the long run, massive investments in renewable energy are needed. The report argues that the only feasible way to finance these substantial upfront investments is through joint borrowing at the EU level.

FIGURE 10 Skills shortages in the EU Job vacancy rate (% of total posts)



Source: Eurostat

### 3. Strengthening Security and Reducing Dependencies

The third transformation revolves around increasing security by diversifying supply chains away from strategically risky regions like China. Draghi highlights Europe's heavy reliance on other countries for critical raw materials (CRMs) and digital technologies, which poses significant risks of price volatility and instrumentalisation of resources as geopolitical weapons. He calls for heavy financing to de-risk and for uniform EU foreign economic policy regarding trade agreements, key resources and crucial technologies, to replace the current patchwork of national strategies.

In addition, the report presses for robust defense industrial capacity to meet rising military demands and stay competitive in defense technology. While the EU defense sector is strong (with €135 billion in turnover in 2022), it trails behind the US due to lower demand and insufficient innovation. Draghi also identifies the space industry as another area in decline, requiring updated regulations and investment programs to rejuvenate the sector.



### Conclusion: a call for greater integration

In summary, the report encourages Europe to embrace **deeper integration**, both fiscally and strategically. Decarbonising the European economy, reviewing unanimity requirements in EU institutions, modernizing European industry and returning productivity to its pre-2008 trend all at the same time will **require €800 billion annually** or about 5% of the entirety of the EU's GDP. This implies an increase in the EU's overall investment level from 22% of GDP to 27%, a historically unprecedented level. No European nation alone has the fiscal capacity to undertake this level of investment alone.

Hence, Draghi recommends new EU-wide debt instruments and closer cooperation across sectors: even if increasing the EU's policy scope may sound bureaucratic, he argues that greater European cooperation will actually reduce friction by standardizing processes across the continent.

In essence, the report is a call for a more federal Europe, similar to past proposals, but justified in economic terms as the only way to rescue Europe's faltering economy and ensure its advancement on the global stage. We can only wait and see how and whether it will be implemented.



WRITTEN BY:  
**ALBERTO SCHEMBRI**

# WATER CRISIS IN SICILY

Famed for its rich cultural heritage, stunning monuments, and picturesque cities, Sicily is known across the world for its vibrant beauty, different traditions, and breathtaking coasts. Yet, behind the allure of its landscapes, a looming issue has garnered widespread attention: the water crisis. This pressing issue has dominated headlines across regional, national, and even international media outlets, highlighting not only the significant impact on the environment but also the growing mobilization of the island's residents. Notably, the city of Agrigento has emerged as a focal point of protest.

Agrigento, a province celebrated for its architectural and cultural wealth, has not only showcased its natural beauty but also a deep sense of community and justice. The #VOGLIAMOL'ACQUA (We Want Water) committee, alongside over 2,000 citizens, recently gathered in Piazza Cavour on the Viale Della Vittoria. These historic landmarks became the stage for protests aimed at Aica President Settimio Cantone, criticizing his lack of attention and inadequate economic measures to address the long-standing water emergency, which has now reached a critical stage. Adding his influential voice to the cause was Archbishop Alessandro

Damiani, who expressed solidarity with the committee and the people of Agrigento.



At the time of the protest on August 2, 2024, water was being rationed, with citizens receiving it only once every 15 days. Agrigento's mayor, Francesco Miccichè, had issued an ordinance urging residents to minimize the use of potable water from the local supply network. The directive also prohibited its use for street cleaning, washing cars, and watering gardens and orchards.

In addition to protests in Agrigento, similar demonstrations have erupted in several other Sicilian cities. These public outcries were accompanied by statements from well-known regional political figures. One of the most notable remarks came from former regional president Nello Musumeci,

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who admitted: "We believed water was inexhaustible. We wasted it, and now it is taking its revenge." (Credevamo che l'acqua fosse inesauribile. L'abbiamo sprecaata, ora si prende la rivincita)

Who exactly believed that? Who thought water was an unlimited resource?

In Sicily, there are currently 24 desalination plants, installed only a few decades ago, yet only half are operational, while the others remain broken or unused. In May 2023, €20 million were allocated to "remedy" the already critical situation. Despite these efforts, the water scarcity persists.

Beyond the voices of regional politicians, the Italian public, and particularly Sicilians, have been treated to two additional enlightening comments. The first came from the Minister of Tourism, Daniela Santanchè, who sharply remarked on an article published by the New York Times regarding the Sicilian water crisis: "Adding insult to injury." (Danno al danno)

Then came the words of the Minister of Agriculture and Food Sovereignty, Francesco Lollobrigida, who observed: "Fortunately, this year the drought has primarily affected parts of the south, particularly Sicily, and much less so the other regions of the country."

(Per fortuna quest'anno la siccità ha colpito alcune zone del sud e la Sicilia in particolare e molto meno le altre zone del paese)

The following lakes serve as unfortunate witnesses to the minister's comment, having dried up due to the ongoing drought:

- Lake Pergusa
- Lake Disueri (Gela, CA)
- Lake Fanaco (Palermo)
- Lake Ogliastro and Parzillo (Catania)

Perhaps it was only the regional government and various ministerial departments that believed water was an endless resource. Or maybe it was just another local myth.





WRITTEN BY:

**MATTEO MELLO**  
**RICCARDO SCIBETTA**



# UNDERSTANDING FACIAL RECOGNITION

Facial recognition technology has become an integral part of our daily lives due to its simplicity and practicality. We use it to unlock our phones, access mobile banking apps, and even secure our homes. In this article, we'll explore the different ways facial recognition is used, how it works, and the challenges it faces. We'll also take a closer look at FaceNet, a convolutional neural network (CNN) algorithm developed by Google in 2015. At last we'll explore the fascinating connection the technology has to neuroscience.

## **Applications**

Many applications belong to the realm of cybersecurity and identity verification, because facial recognition is more secure than one-time passwords or two-factor authentications, as it does not involve the use of passwords that can be compromised by hackers. Just to mention a few: smartphones and tablets, banking systems, airport security and border control.

Further, it can be used by local authorities like police and secret services to recognize suspects. This has often raised questions on the ethics of its extensive application on the general public. Countries adopted various approaches, for example Belgium

and Luxembourg have banned it, Italy implemented strict policies restricting its use to criminal investigations, China, Russia and Argentina use it extensively and with invasive outcomes.

Dozens of other applications have been developed, from systems recognizing problem gamblers at slot machines to dating sites matching people with compatible facial features, some even predict that the future of ads is facial recognition based, with dynamic ads that adjust to appeal to a person's interests the moment they notice the ad.

## **How it works**

Computer vision automates the extraction, analysis, classification, and understanding of useful information from image data. Image data can take various forms, including single images, video sequences and three-dimensional data.

Subsequently, the facial recognition system maps and interprets the shape of the face and facial expressions, identifying the key elements on the face that distinguish it from other objects.

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In general, facial recognition technology analyzes the following elements:

- Distance between the eyes
- Distance between the forehead and chin
- Distance between the nose and mouth
- Depth of the eye socket
- Shape of the cheekbones
- Contour of the lips, ears, and chin



[Image from MIT News: <https://news.mit.edu/2022/optimized-solution-face-recognition-0406>]

Later, the system converts facial recognition data into a series of numbers or points that form a facial imprint. Each person has a unique facial imprint, similar to fingerprints.

### Challenges

Many challenges and complications are involved in applying facial recognition in real environments:

- Subtle changes in lighting conditions can pose challenges for automated facial recognition algorithms, potentially distorting results even when the person's pose and expression remain similar. Sometimes, two images of the same face under different lighting appear more distinct than two different faces under the same lighting.

- Facial recognition algorithms are sensitive to angles and poses. Changes in head movements or camera positions can alter facial appearance, affecting recognition accuracy. For instance, if a database lacks diverse angles, recognition may fail for faces with higher rotation angles.
- Facial expressions, from macro (happy, sad, angry) to micro (rapid facial movements), further complicate recognition, as emotional states influence expressions. Additionally, makeup and accessories like glasses can hinder recognition.
- Resolution matters. Low-resolution images like common CCTV footage lack detail and hinder accurate analysis. The minimal image size requirements for effective analysis typically exceed 50×50 pixels.

### Algorithm

One of the most popular algorithms used for face recognition is FaceNet, developed by Google in 2015. It's a technology based on a convolutional neural network (CNN) that enables face verification, recognition, and clustering. The essence of the FaceNet algorithm lies in creating a Euclidean space where all images are embedded. The distance between two images indicates their similarity: the smaller the distance, the greater the similarity. By defining a threshold  $d$ , all images with distances less than  $d$  are considered of the same identity. The most challenging aspect is finding the correct embedding function that assigns a vector in the Euclidean space to each image.

This embedding must ensure that images of the same identity have small distances while those of different identities have large distances. FaceNet learns mappings from images and creates embeddings directly, rather than using an additional layer for recognition or verification.

To find the embedding, a loss function is defined and then minimized using Stochastic Gradient Descent (SGD) to find the correct embedding.

### LOSS FUNCTION

In order to understand the choice of the loss function, let's analyze what we aim to find. The goal of the algorithm is that similar faces have short distances, while different ones have large distances.

We define the following parameters:

$f(x_i^a)$  = anchor face, that is a face that we use as a reference

$f(x_i^p)$  = a face similar to the anchor one

$f(x_i^n)$  = a face different from the anchor one

$\alpha$  = the distance threshold under which we say that two faces are of the same person

Therefore there must hold that:

$$\|f(x_i^a) - f(x_i^p)\|_2^2 + \alpha < \|f(x_i^a) - f(x_i^n)\|_2^2, \tag{1}$$

$$\forall (f(x_i^a), f(x_i^p), f(x_i^n)) \in \mathcal{T}. \tag{2}$$

The loss function will be:

$$\sum_i^N \left[ \|f(x_i^a) - f(x_i^p)\|_2^2 - \|f(x_i^a) - f(x_i^n)\|_2^2 + \alpha \right]_+$$

Therefore, in order to train the model we need a set of triples  $\{f(x_i^a), f(x_i^p), f(x_i^n)\}$ .

### Choice of the triples

The choice of the triples to be used is crucial. The best picks of triples have been revealed to be the ones with the greatest distance between  $f(x_i^a)$  and  $f(x_i^p)$  and the ones with the smallest distances between  $f(x_i^a)$  and  $f(x_i^n)$ .

However, this could result in having too few data or to have biases in the model since most of the  $x_i^p$  with great distances from the anchor are usually poorly imaged faces.

The two most important techniques employed in order to solve this problem are:

1) Generating triplets offline every n step of the training

- In this approach, triplets are pre-generated every n steps of training, typically using all available data

2) Generating triplets online from some created mini batches

- During each iteration, a mini-batch of samples is selected, and triplets are formed from within this batch. This method adapts to the changing distribution of data and can handle large datasets more efficiently.

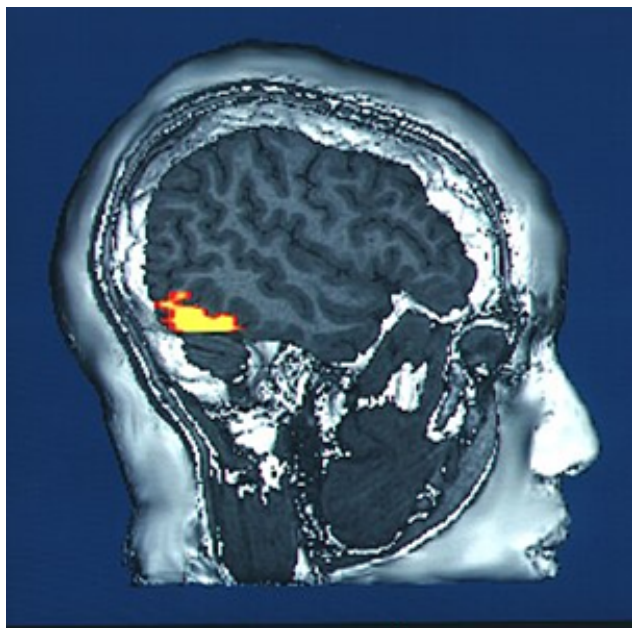
These techniques help ensure that the FaceNet model learns robust representations by exposing it to diverse triplets during training.

By carefully selecting triplets, the model can generalize well to unseen faces and achieve high accuracy in face recognition tasks.

## Face recognition and neuroscience

Unknown to many is the profound link between facial recognition technology and neuroscience.

In 2022, at the MIT Institute for Brain Research, scientists investigated the fusiform face area—a specialized region within the brain's temporal lobe that's uniquely responsive to human faces. They were curious about why the brain designates separate regions for recognizing faces and objects. To probe this mystery, they trained a Deep Neural Network on a vast dataset of images featuring various objects and faces, with the sole task for the network being able to differentiate between items like bicycles, faces, and pens.

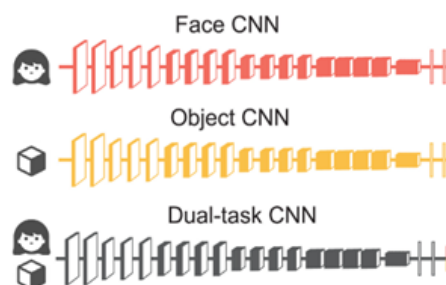


Fusiform face area, Image from [Wikipedia](#)

As the network refined its ability to identify these images, it began to self-organize in a manner strikingly similar to the human brain. Initial layers of the network processed visual information broadly, while the deeper layers evolved to focus specifically on faces.

Intriguingly, the network achieved this specialized organization without explicit instructions, suggesting that both the artificial network and the human brain naturally evolve to optimize their processing efficiency. This study not only sheds light on the intrinsic connections between artificial intelligence and human cognition but also enhances our understanding of brain architecture itself.

[The whole article is available on Science, [here](#)]



Three networks with VGG16 architecture (left) were optimized, one on face identity categorization (Face CNN in red), one on object categorization (Object CNN in orange), and one on both tasks simultaneously (dual-task CNN in gray)

## Conclusion

In conclusion, facial recognition technology has seamlessly integrated into our daily routines, offering convenience and enhanced security for tasks like unlocking phones and banking. Its fascinating link to neuroscience, highlighted by MIT research, reveals intriguing parallels between AI and human brain functions.

Advanced algorithms like Google's FaceNet have improved accuracy, yet they must continue to address biases and perform well under diverse conditions. As facial recognition evolves, it's crucial to balance its potential benefits with ethical considerations, ensuring that facial recognition enhances our lives without compromising personal freedoms.





WRITTEN BY:  
FEDERICO ERMINIO SPADARO

# FESTIVAL FEVER

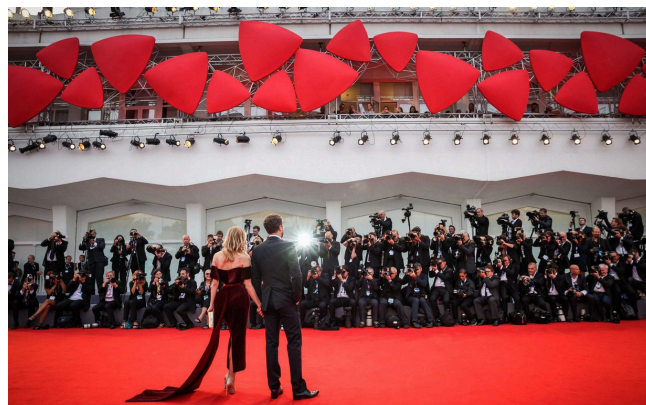
## A DOCTOR'S REPORT ON THE VENICE FILM FESTIVAL

The patient seems responsive. He came back from the Venice Film Festival early this September. He was exposed to highly anticipated films, celebrity encounters and ticket queues in 30 degrees weather. He has contracted Festival Fever. For the benefit of the scientific community, I copy down extracts from the patient's diary, which contain much useful data on upcoming films and some insider information about the Film Festival.

The Venice Film Festival is one of the most iconic film festivals in the world. It is a launching pad for young artists and, generally, a good predictor for the prestigious Oscar nominations.

### The patient seems rational.

The selection of this year's films focuses its attention on strong character stories whose desire for identity, beauty, art brings them to unexpected and, at times, tragic consequences. Angelina Jolie is Maria Callas in *Maria*, a biopic on the legendary opera singer which blurs documentary elements, grandiose sets and phenomenal acting work. Daniel Craig shuffles off his cool from the James Bond films to be a clumsy lover. He is starring in *Queer*, a tale of love, rejection and Nirvana. Come from Craig (and internet heartthrob Drew Starkey), but stay for the dreamlike aesthetics of director Luca Guadagnino (*Call Me By Your Name*, *Bones and All*, *Challengers*).



OK, I'll say it! I know who will win the Oscar for Best Picture. *The Brutalist* is a 3 hour film (hear me out), about a fictional Hungarian architect (hear me out) that tells the story of a construction site (hear me out!). Few films can give you the same complex, dopamine-inducing rush of finishing a great book. *The Brutalist* is one of them. The direction of Brady Corbet, not lacking in swiftness of narration, and the interpretation by Adrien Brody (the architect) and Felicity Jones (his iconic wife) will not disappoint you. You will need a toilet break half through. I know I did. But you will be back on your seat in no time.

### **The patient starts to lose grip with reality.**

I have met movie legends. I had the chance to attend masterclasses from director Peter Weir (Dead Poets Society, Master and Commander and The Truman Show, to name a few) and the Ethan Hawke (Dead Poets Society, Before Sunset and, more recently, Moon Knight).

Peter Weir really dresses as a bona fide Hollywood legend: sunglasses, anecdotes and a Panama hat. In Venice, he spilled his secret recipe for creating cinematic masterpieces. The method is simple: 1. make a trailer in your mind based on the film script; 2. pull out the best images from the trailer and start to look for inspiration in books and paintings; 3. divide your film into A scenes and B scenes. A has to be superb; B has to be shot quickly. At the end, you have The Truman Show. Easy, no?

Ethan Hawke is a much approachable celestial body. In his career, he has received many noes and few, significant yesses. To the young audience in Venice, he imparted some lessons in resilience. "The world is not built to make our dreams come true.

Every time life is hard, you are being asked to grow." "But remember", he said, "It is supposed to be difficult."

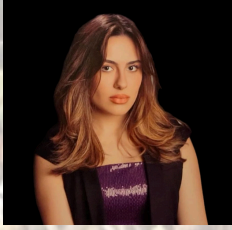
### **He lost it.**

I am the festival; the festival is me. I have seen talentless stars rubbing shoulders with talented unknowns, angry festivalgoers facing off with confused Venetian ladies, high-brow movie critics talking to blindly adoring fans. I have seen hands rising from a sea of people touching George Clooney's jacket, screaming for a photo, please!

One night, I myself stopped Italian actor Sergio Castellitto on his tracks, his wife pleading him "Dai Sergio, take a picture with these kids." I attended the Queer premiere. Waited at the Artists' exit. An elderly woman wanted to reach the exit; she was blocked by two meters tall autograph-hunters. I let her pass through my side. She had to meet her son. "What's your son's name?", I ask. "E' Luca" she said, "è il film del mio Luca (Guadagnino)!"

**The patient has come back delusional. He believes in the power of art. He believes cinema can change lives. He thinks that dreams can come true. He is deep into Festival Fever. Let's hope he does not recover.**





WRITTEN BY:  
**IRMAK OZDOGAN**

# SPEAK UP FOR TURKISH WOMEN

Last week, Turkey was shaken to its core by an unspeakable tragedy—one that left the entire nation grappling with horror, outrage, and fear. In broad daylight, 19-year-old Semih Çelik committed two brutal murders within the span of just 30 minutes. He killed Ayşenur Halil, by slitting her throat like a monster. Later that day, as if it was a scene ripped from a nightmare, he beheaded a young woman, İkbal Uzun, and tossed her severed head from a historic building in the heart of Istanbul. These horrific acts sent shockwaves throughout the country, leaving Turkish women reeling—terrified, angry, and heartbroken—over the harsh reality that they are forced to navigate daily: the fear that they too could become a target of such violence. The primary source of this problem is the conservative

policies pursued by the government that interfere with people's daily lives, creating an authoritarian, political Islamist regime that masquerades as a democracy. The Council of Europe's Convention on Preventing and Combating Against Women and Domestic Violence, commonly referred to as the Istanbul Convention, mandates that participating countries create laws, policies and support systems to address violence against women in domestic abuse. Turkey is no longer a part of the convention. In explaining Turkey's withdrawal, the Turkish Presidency issued a statement accusing the LGBT community -which polarises the people and increases hostility even more- asserting that it had been "hijacked by a group seeking to normalise homosexuality", which they argued "conflicts with Turkey's societal and family values". It is clear that this justification contradicts the principles of Islam rather than representing the family values of Turkey. The Republic of Turkey was founded on the principles of secularism, this justification is contradictory to the country's founding foundation. When systematic inequalities exist, marginalised groups often face heightened vulnerabilities which can manifest in



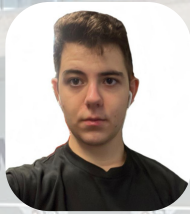
## STELLA POLARE

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extreme forms of violence. The increasing rates of femicides are not only a great violation of human rights but also a reflection of deeper societal issues, such as gender inequality and the failure of the state to protect its citizens. If left unaddressed, this violence can lead to disturbing social tensions, undermining the rule of law and a broader breakdown of social cohesion, ultimately increasing the likelihood of collapse.

The tragedy of Semih Çelik's victims is part of a broader narrative—one that highlights the urgent need for reform, accountability, and justice. The lives of Turkish women cannot, and must not, be reduced to statistics or political bargaining chips. Without systemic change, the escalating violence risks pushing the country further toward social collapse.





WRITTEN BY:  
ALBERTO INSARDÀ

BOCCONI SPORT CENTER

# FOCUS ON: BOCCONI SPORT FUTSAL EDITION

Interview with **Davide Gabriele**, captain of the men's futsal team

Futsal, for those who don't know, is the official name of what we all call 5-a-side football, with the only difference that it is played on parquet, rather than on grass like in many amateur competitions. There is both a men's and a women's team. The first plays in a federal championship, Serie C2, and competes with other teams from all over the Lombardy region. The second, however, plays in the university championship, facing only students from other universities.

**- Hi, first of all how are you, how long have you been captain of your university team, and how do you feel about having received this role?**

- Hi, everything is fine. This is the first year that I am captain, since the historic captain Simone Lumi has decided to retire this year, to take on the role of 2nd coach. I am very honored that my teammates and the coach chose me for this role, because the team has always been a point of reference for me, since my first year of university.

**- Three undefeated games. After a troubled salvation last year, did you expect a start like this? Having said that, do you think you can realistically aim for the playoffs, or is your goal always salvation?**

- I am really happy for the start of the season, but even before it started we were all confident. Obviously we always aim to win, and we believe that the playoffs can be a real goal.

**-In your opinion, how feasible is a university path, which in addition to study and socializing, also includes sports at a competitive level? Do you feel like recommending it to other boys/girls?**

- Reconciling a university path with a sports one, from my point of view, is feasible, given that training sessions are always placed in the evening. It certainly requires some sacrifices, but with good organization you can do anything. I recommend everyone to try an experience like this, even with a non-competitive sport, because it helps to "let off steam" from the university routine.



## STELLA POLARE

- Last year you got 14 points out of 21 playing at home. How important is the public factor for you? In addition to this, how important are the opportunities that Bocconi University offers you?

- Playing at home is very important for us, in fact we try to involve our friends and acquaintances, to fill the arena even more. Obviously the structure also plays its part, being unique in the environment.

- Is it a problem, in your opinion, that the team (between students who leave, or who can't manage studying and sports at the same time) can substantially change every semester? You who have been here for 4 years, how do you find playing with often different teammates?

- In my opinion, turnover is not a huge problem. In the end, many kids, who go on exchange or other, decide to come back. So the group remains substantially the same, and is always very close-knit.

- After you finish studying at Bocconi, would you like to continue your stay in the Bocconi Sport Team, or do you think it is incompatible with work?

- Yes, I would really like to continue playing even when I work. There are already alumni within the team, and I would like to be among them.



- Finally, make an appeal to all the readers of "Stella Polare" to introduce them to futsal

- I look forward to seeing you all at the Sport Center (in Viale Toscana 30), on Friday evening at 10. We will really be happy to see you at the stadium, and it will help us give our best.



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