HOW FACIAL RECOGNITION REALLY WORKS.

A plain-English guide — no technical knowledge needed.

FAICE TECH
THE ETHICAL AI COMPANY

THE COMMON MISCONCEPTION

MOST PEOPLE ASSUME IT WORKS LIKE A HUMAN RECOGNISING A FACE.

✗ THE MYTH

"It sees two faces and decides they look alike — just like a human would."

This is not what happens. The system has no sense of what a person 'looks like'. It has never seen a face in its life.

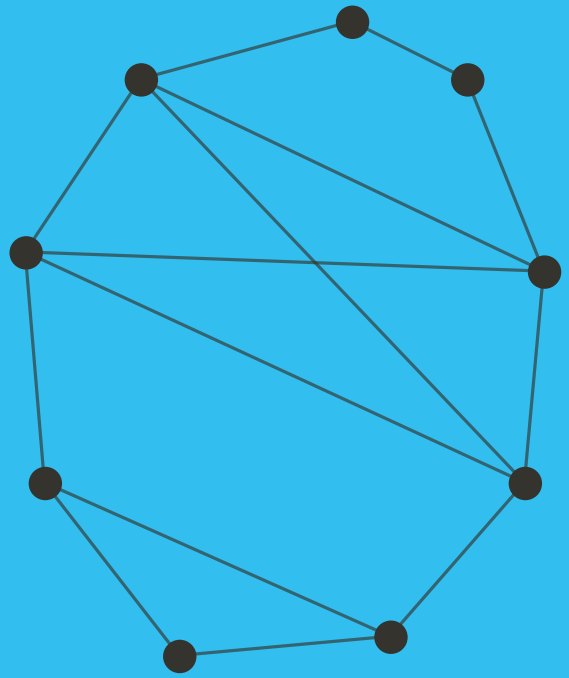
VS

✓ THE REALITY

"It compares two sets of numbers — and checks if the maths lines up."

No emotion. No judgment. No appearance. Pure arithmetic — every single time.

THINK OF IT LIKE A FINGERPRINT.

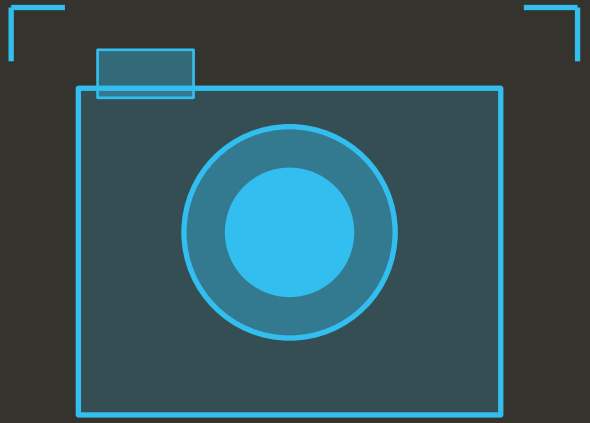


Just like a fingerprint, your face creates a unique mathematical profile. But here's the key difference — a fingerprint stays the same, whereas the numbers your face generates shift slightly with every photo taken.

So the system doesn't look for an exact match.
It looks for a score that's close enough.

STEP 1

THE CAMERA CAPTURES AN IMAGE.

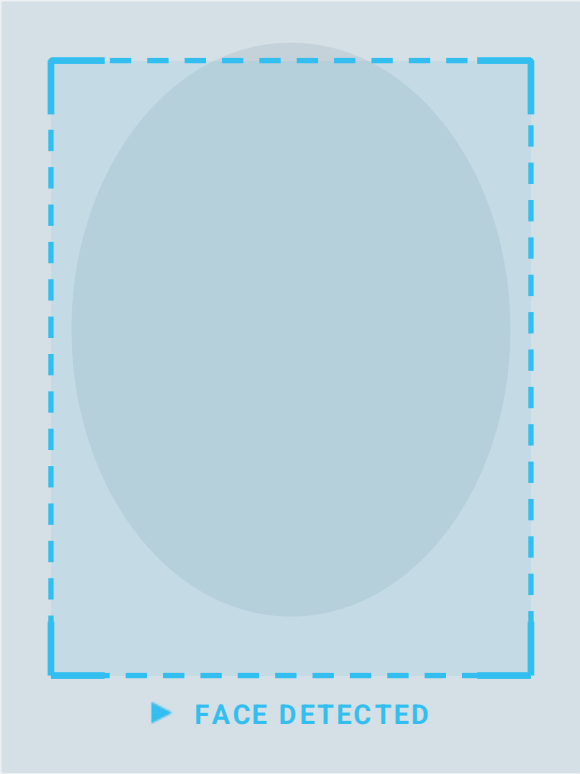


A camera in the system — whether at an entrance, gate, or checkpoint — takes a photo of the person walking past. This happens in a fraction of a second.

STEP 2

THE SYSTEM FINDS THE FACE.

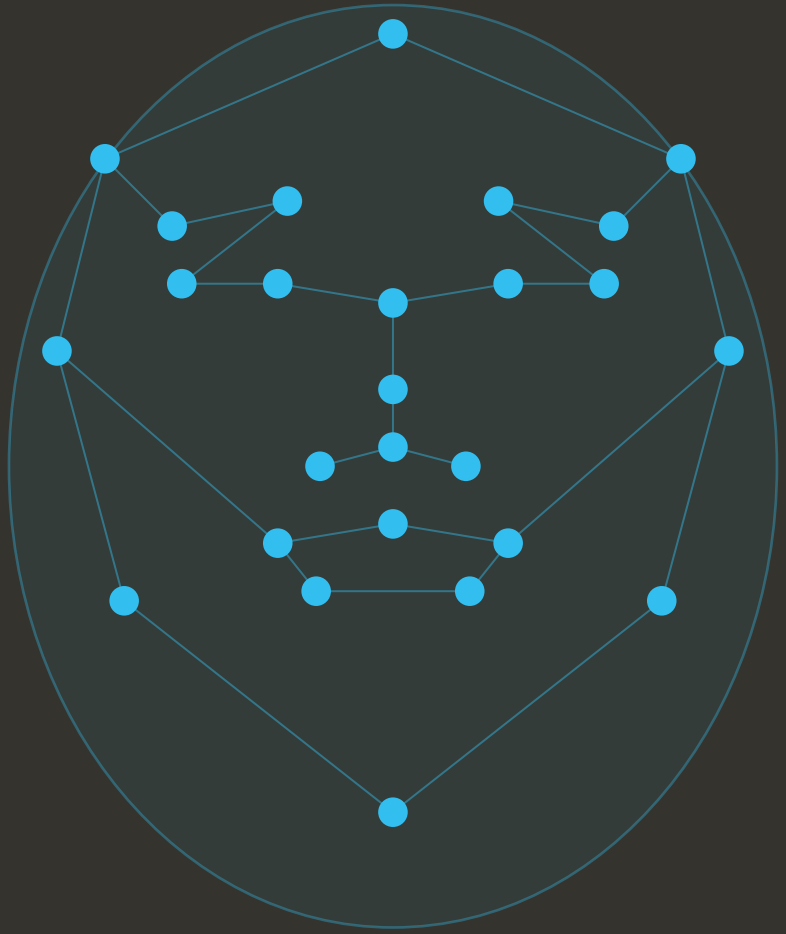
Before anything else, the software finds where the face is in the image. It looks for the right proportions of eyes, nose, and mouth — then isolates that area to work with.



STEP 3

DATA POINTS ARE MAPPED.

← Data point



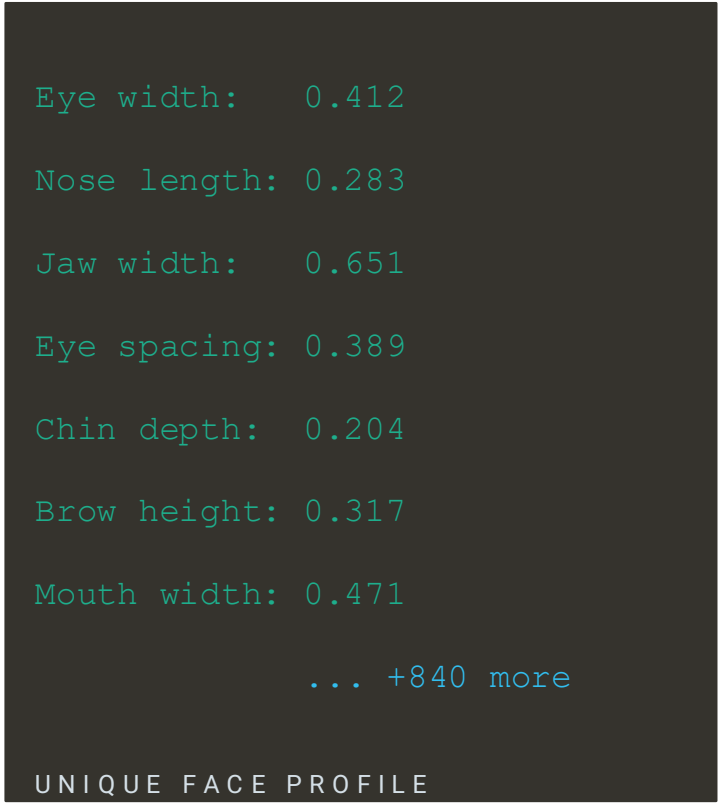
The system places invisible 'pins' on specific landmarks — corners of the eyes, tip of the nose, edges of the mouth, the jawline, and many more.

Think of it like a dot-to-dot puzzle on your face.

STEP 4

THE POINTS BECOME NUMBERS.

Each data point is given precise coordinates. The distances between them are measured — eye width, nose length, jaw width, and hundreds more. Together they create a unique numerical face profile.



STEP 5

TWO PROFILES ARE COMPARED.

The algorithm measures how closely the two number sets match. This is pure arithmetic — nothing more.

PROFILE A — Live Camera

```
Eye width:    0.412
Nose length:  0.283
Jaw width:    0.651
```

VS

PROFILE B — Watchlist

```
Eye width:    0.411
Nose length:  0.284
Jaw width:    0.650
```

STEP 6

MATCH OR NO MATCH.

If the numbers are close enough, it's a match. If not, it isn't. The system works to a pre-set 'confidence threshold' — a score that decides what counts as close enough.

✓ PROBABLE MATCH

`Score: 94.7%`

Above the threshold — the two profiles are mathematically close enough to be the same person.

✗ NO MATCH

`Score: 31.2%`

Below the threshold — numbers are too different. The system treats these as two separate people.

IT DOESN'T SEE FACES.

IT SEES MATHS.

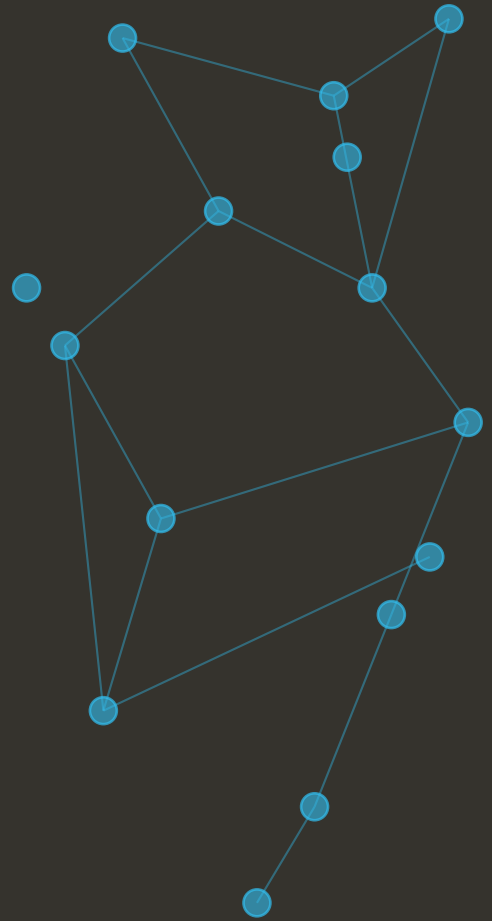
The system has absolutely no concept of what a person looks like. It cannot — and does not — factor in any human characteristic. It only ever works with numbers.

- ✗ RACE
- ✗ GENDER
- ✗ AGE
- ✗ SKIN COLOUR
- ✗ HAIR COLOUR
- ✗ EMOTION

Only the maths. Always just the maths.

SECTION TWO

THE NUMBERS ARE NEVER IDENTICAL.



Each photo creates a slightly different face map. Here's why — and why that's completely normal.

WHY THE NUMBERS CHANGE

FIVE THINGS THAT CHANGE THE NUMBERS.

1. **LIGHTING** — Shadows and brightness shift the exact values the camera captures from your face.
2. **ANGLE** — Even a small head turn changes how far apart facial features appear to the camera.
3. **EXPRESSION** — Smiling or frowning moves the data points around your mouth, chin and cheeks.
4. **CAMERA QUALITY** — Lower-resolution cameras produce less precise data — fewer usable measurements.
5. **FACE COVERINGS** — Hats, hoods, scarves, facial hair or glasses can hide certain data points from the system entirely.

SIMILAR IS GOOD ENOUGH.

Each photo of the same person produces slightly different numbers — but they stay within a recognisable range. The algorithm calculates a similarity score to measure how close the two sets are.

One perfect code doesn't exist — every photo creates its own slightly different version of you.

PHOTO A	
Eye:	0.412
Nose:	0.283
Jaw:	0.651
Brow:	0.317
Chin:	0.204

PHOTO B	
Eye:	0.409
Nose:	0.286
Jaw:	0.654
Brow:	0.314
Chin:	0.207

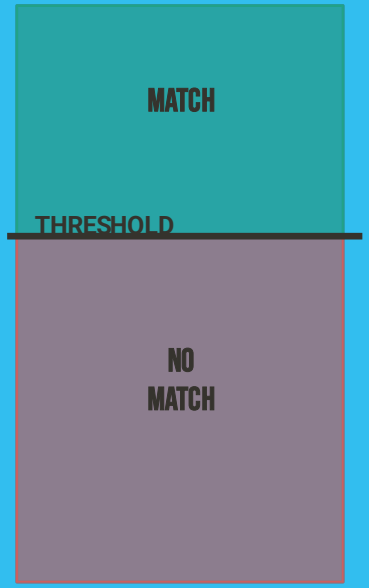
SAME PERSON — DIFFERENT PHOTOS

97.3% SIMILARITY SCORE

Same person. Different photos. Still a match.

SECTION THREE

HOW THRESHOLDS WORK.

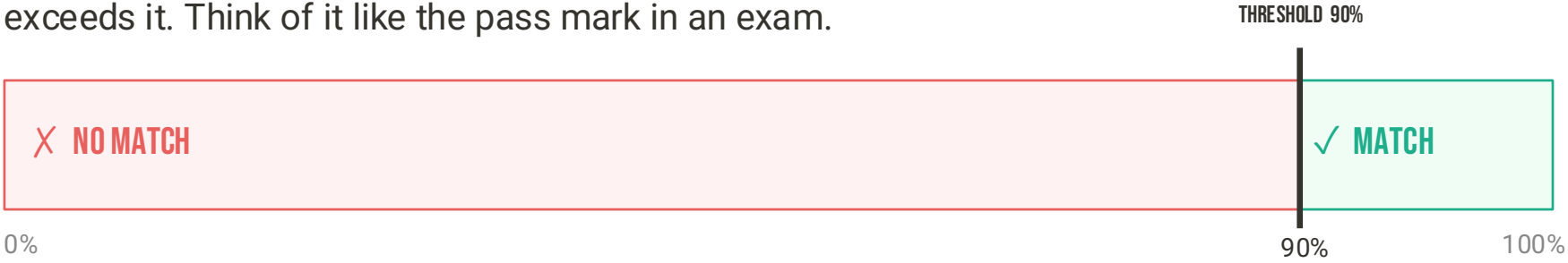


The line between a match and a no-match — and why it moves.

HOW THRESHOLDS WORK

THE PASS MARK THAT DECIDES A MATCH.

A threshold is a minimum confidence score. The system only flags a match when the similarity score meets or exceeds it. Think of it like the pass mark in an exam.




```
Score: 31.2%  →  ✗ NO MATCH — below threshold
```

```
Score: 94.7%  →  ✓ MATCH — above threshold
```

WHY CCTV USES A LOWER THRESHOLD.

The real world isn't a passport booth. Here's why a lower threshold is necessary — and the right call.

01

WATCHLIST PHOTOS AREN'T PASSPORT-QUALITY

Reference images vary and are often angled and taken at a distance. The starting profile is already imperfect.

02

CAMERAS CATCH ANGLED SHOTS

People rarely walk in staring directly at a camera. Side-on angles mean fewer data points can be accurately measured.

03

HOODS, HATS & FACE COVERINGS

Anything obscuring the face reduces the number of measurable data points — lowering the natural score.

04

FEWER USABLE DATA POINTS

Combined, these factors reduce the number of reliable measurements. A lower threshold compensates for this.

THE HUMAN ELEMENT

THE SYSTEM FLAGS. THE HUMAN CONFIRMS.

01
ALGORITHM FLAGS A PROBABLE MATCH

Similarity score meets the threshold

→

02
HUMAN REVIEWS

Trained operator examines the result

→

03
DECISION IS MADE

Confirmed or dismissed

The algorithm narrows the search. The human makes the call. This is not optional — it is essential.

THE BOTTOM LINE.

1. The system never sees a face the way a human does — it only ever processes numbers.
2. It maps data points on specific facial features and converts them into a mathematical profile.
3. Two profiles are compared using arithmetic. If the numbers are close enough, it's a match.
4. Each photo creates slightly different numbers — lighting, angle, and quality all play a role.
5. A threshold sets the minimum confidence score required before a match is flagged.
6. In CCTV deployments, lower thresholds compensate for fewer usable data points — and a trained human must always review the result.