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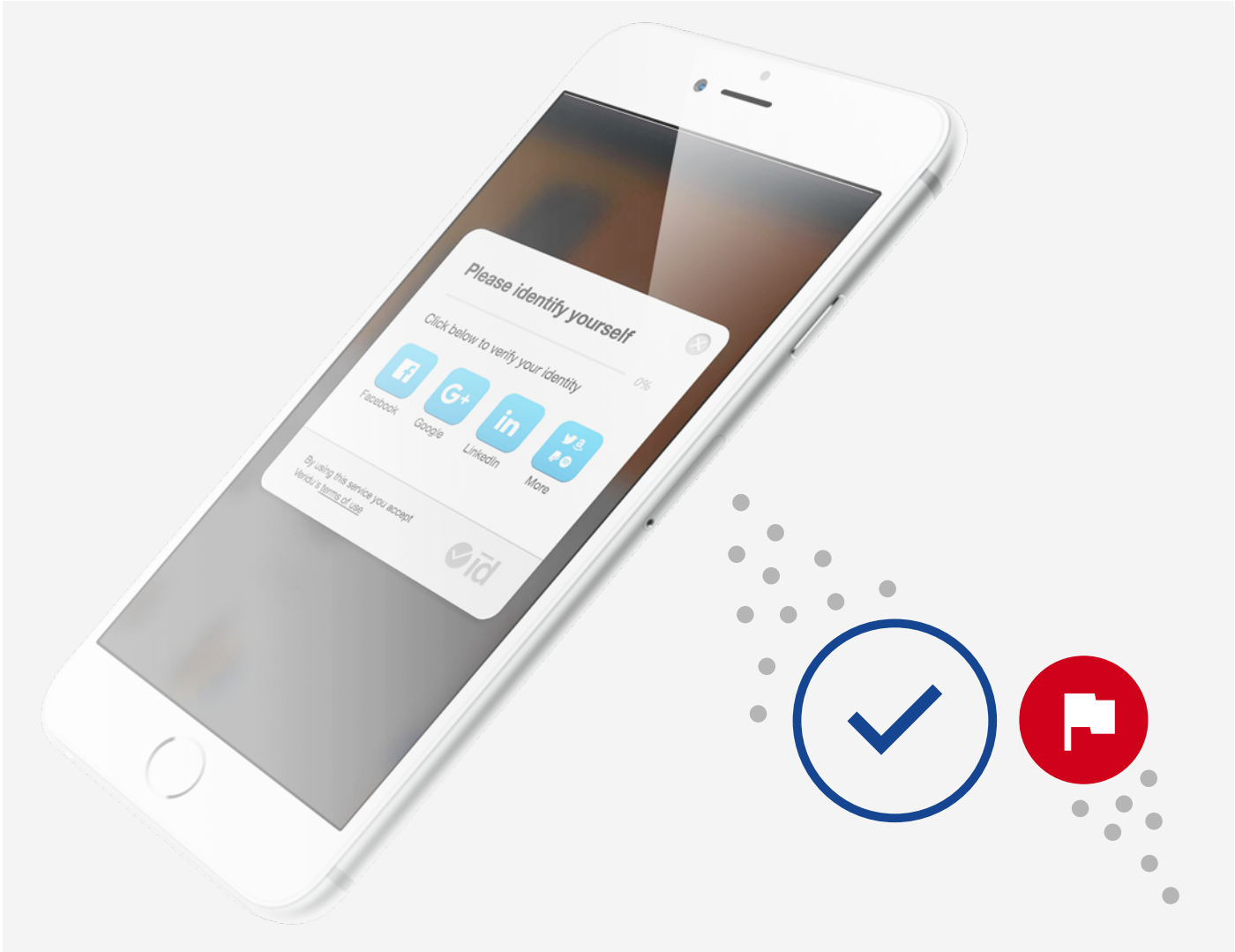
Global identity verification based on your online activity



Verified Onboarding

Maintain your site's integrity

Verified Transactions

Accept more good customers

Verified Internet Life

Proof of online activity

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Why Veridu?

Traditional forms of identity don't meet today's needs

The Challenge

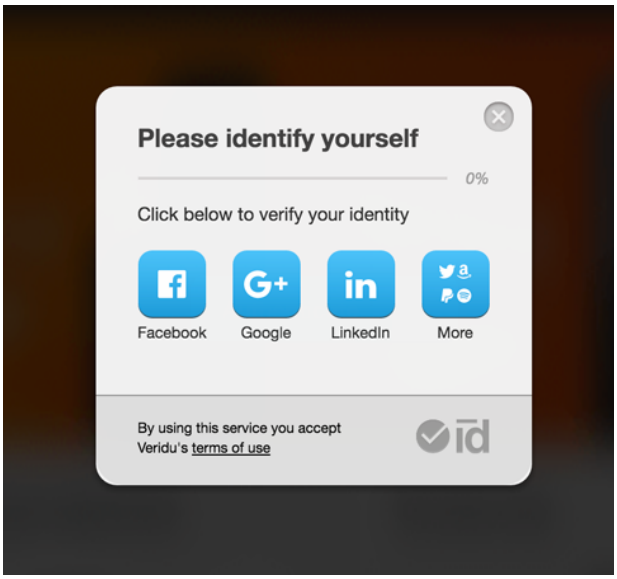
Your identity is your ticket to purchasing goods, accessing financial services and collaborating online. Unfortunately, your identity is also a fraudster's ticket to freely pursue their internet-based criminal activities.

Juniper estimates that online fraudulent transactions will reach a staggering $25.6 billion by 2020.[1]

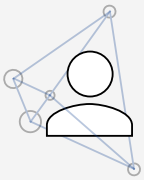
You need to protect your online business from this increasing risk by quickly, cost-effectively and accurately identifying your customers, wherever in the world they are - and that's no easy feat when you consider that:

- **2.4 billion people** lack an official identity[2]. Many of these people do, however, have internet access, smart phones, and the need and desire to access goods and financial services online, making them potentially valuable customers.
- **75% of the world's** population has no credit file, but despite this many organisations still rely on this data as part of the customer identification and onboarding process.
- **Millennials and Generation Z** are driving the growth of the online sector, but many have little to no credit history and lack traditional forms of ID (like driver's licenses, utility bills etc.). They're also impatient and want immediate access when transacting online.

Nearly a quarter (22%) of users aged under 34 years old abandoned a transaction because they couldn't pass a platform's identity verification requirements, compared to only 13% of over 55 year olds.[3]



Veridu Products



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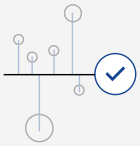

Verified Internet Life

Proof of online activity

[1] *Juniper, Online Payment Fraud 2016.* [2] *WorldBank.org, 2015.* [3] *Sharing Economy Consumer Views Survey, 2016*

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Keep out fraudsters, let legitimate customers in

Week in, week out the media reports on yet another data breach. The dark web is brimming with databases of compromised identity data including Personally Identifiable Information (PII), credit card details, account login credentials, passport numbers... the list goes on.

So, if your ID verification and fraud prevention strategies are still based on government-issued identity documents[4], traditional identity providers and credit reports, it's time to ask yourself why.

The solution

The good news is that each and every day we generate a vast amount of data as we browse and interact on the web, our phones and other devices. This trail of information is our digital footprint, and it's what Veridu uses to verify and authenticate identity.

> *Facebook users like over 4 million posts every minute. Twitter users generate nearly 350k Tweets each minute.[4]*

We gather, structure and analyse this wealth of data, applying a blend of artificial intelligence and machine learning, to instantly assess the credibility of an individual's identity. The result is a global identity solution that offers comprehensive coverage across all regions and demographics.

More customers, less fraud

With Veridu, you can pursue those lucrative, but potentially riskier opportunities, with confidence. The use of social and online accounts and activity to verify identity gives you the broader coverage you need to safely onboard more customers and accept more legitimate transactions, while keeping fraud to a minimum - anywhere in the world.

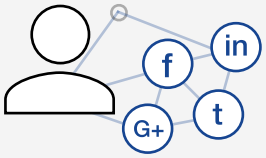
> *The Government Digital Service found that social media activity could increase demographic coverage of GOV.UK Verify by 9%, which increases to 38% for the 16-25 age group.[5]*

Learn more about how Veridu can help you detect and mitigate a wide range of identity-related fraud including:

- New account origination and account takeover fraud
- Card not present fraud
- Ghosting

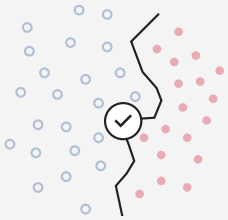
How it works

Data scraping



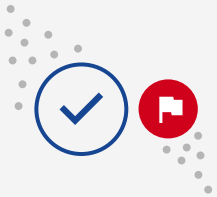
With the user's permission, we scrape their social and online accounts to gather relevant data.

Machine learning



Our trained machine learning models analyse this data and calculate the probability that it's credible.

Decisions



Based on the calculated credibility probability, you immediately receive a binary yes/no decision.

[4] *WERSM, 2015* [5] *OIX UK. 2016*

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Verified Onboarding

Is your focus on user experience leaving you open to fraud?

Fake user accounts, profiles or listings, are often tolerated by businesses as an inevitable aspect of operating online. Why? Because traditional identity verification adds friction to the sign-up process that puts off legitimate customers, not just the fraudsters. If this sounds familiar, it's time to think again.

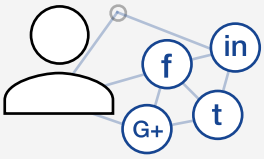
In 2015, incidences of new account fraud more than doubled and now accounts for 20% of all fraud losses.[1]

How Verified Onboarding Works

Single sign-on

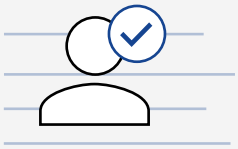
A user signs into their social or online accounts.

Machine learning analysis



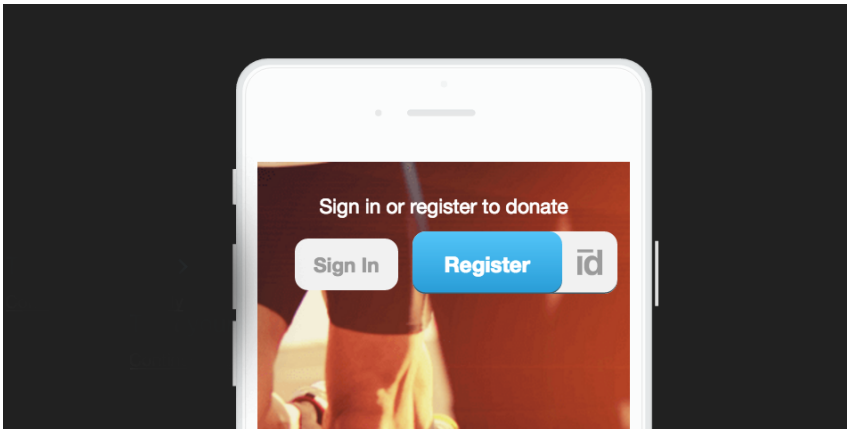
Veridu gathers and analyses the data contained in these accounts. The user's identity information is scored for credibility.

Instant feedback



You receive this information back instantly for fast, informed onboarding decisions.

Fake accounts are not just a nuisance - they lead to increased fraud and a host of other unwanted behaviour including fake listings or reviews. If you choose not to manage this issue, you're putting your business at risk.



Why Veridu?

- **It's frictionless**, unlike SMS/ email verification codes, sharing ID documents or filling out long forms.
- **It's global** and covers all demographics, even those with thin credit files or without government issued identity documents.
- **It's cost-effective**, significantly less than traditional identity providers and credit reference agencies.

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[1] *2016 Identity Fraud Study, Javelin Strategy & Research*

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Verified Transactions

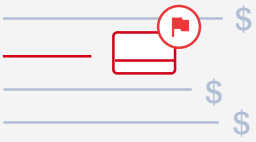
Are you leaving money on the table?

Fraud prevention programmes targeting card-present fraud have pushed criminals onto the internet. To protect themselves, businesses have strengthened their card-not-present fraud programmes and reduced their risk appetite. The result? Perfectly legitimate transactions are regularly being declined. You can overcome this issue by looking beyond traditional methods of identity verification

In the US alone, one in six (15%) of all legitimate cardholders experienced at least one decline because of suspected fraud, resulting in a total of $118 billion declined.[1]

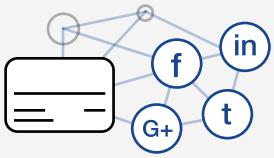
How Verified Transactions Works

Transaction flagged as high-risk



High-risk transactions are pushed through an additional Veridu verification step.

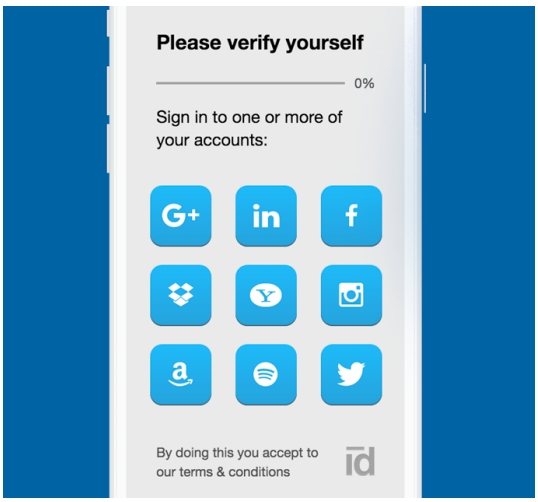
Veridu online verification



The customer signs in to a variety of their social and online accounts. Veridu uses the information contained in these accounts to verify identity.

Accept more transactions

Customers that pass the verification can continue with the transaction.



Why Veridu?

- **It's instant,** unlike time-consuming manual reviews.
- **It's seamless,** and by keeping customers in the same environment you'll reduce abandonment rates.
- **It's comprehensive,** offering coverage of all demographics, including the younger consumers who are driving eCommerce growth.

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[1] *Javelin, Overcoming False Positives, 2015.*

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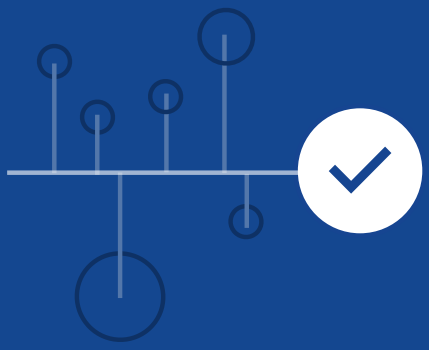
Verified Internet Life

Enhanced protection from key identity-related risks



Fake ID documents, synthetic identities and ghosting (the use of a deceased person's identity) are just some of the identity-related risks facing online businesses. Even if you have an identity verification programme in place, relying purely on static forms of identity, like government issued ID documents, may still expose you to these risks.

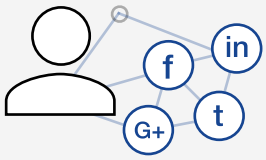
Activity on social media and other types of services, could provide a complementary or an alternative approach to achieving a high level assurance of a digital identity.[1]

How Verified Internet Life Works

Proof of life

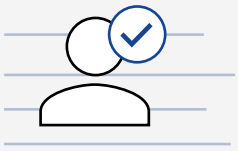
A user signs in to their social or online accounts.

Machine learning analysis



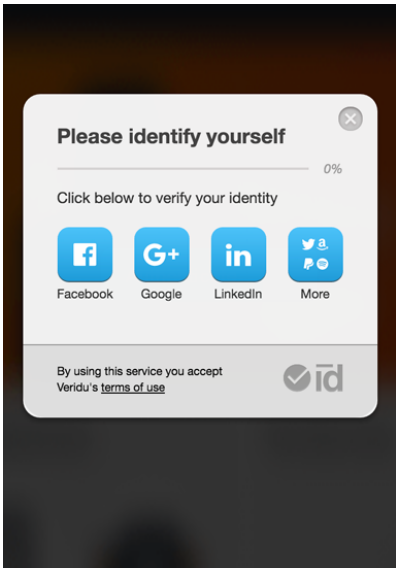
Veridu gathers and analyses the data contained in these accounts and identifies relevant activity events.

Instant decisions



You immediately receive a binary yes/no decision.

You can address these risks by adding an 'online activity history' component to your identity verification programme that requires an individual to prove recent and relevant activity on social or online accounts that are tied to their identity. While assuming a fake or stolen identity is relatively simple for a fraudster to do, creating an associated, and more importantly, credible online footprint is not.



Why Veridu?

- **It's comprehensive**, offering coverage of all demographics, including those with thin credit files and younger users.
- **It's effective**, having been thoroughly tested as part of the GOV.UK Verify programme.
- **It's user-friendly**, and reduces friction and cost when compared with alternative methods of determining activity.

[1]*Open Identity Exchange (OIXUK.ORG), Use of online activity as part of identity verification, 2016*

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Data

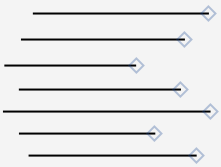
Veridu's data analysis process

Analysing a digital footprint

Your digital footprint contains a staggering amount of information about you, and that's what Veridu uses to verify your identity. But how do we make sense of a mass of unstructured data? How do we work out what's important? And how do we know the data is credible?

How it works

1. Data scraping



A user signs in to their social or online accounts. We gather the raw data.

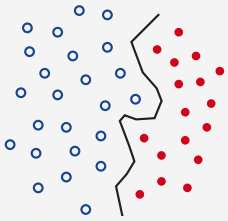
2. Data cleansing

We remove inconsistent or missing information, ensuring we start with high quality data.

3. Feature extraction

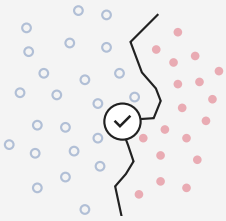
We compute features that serve as structured input to our machine learning models.

4. Model training



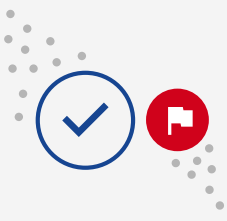
We build learning models to assess the credibility of a users identity.

5. Model evaluation



The learning model is put to the test to ensure it is learning as we expect.

6. Binary decision



Finally we calculate a credibility probability, which is then turned into a binary yes/no decision.

Why machine learning?

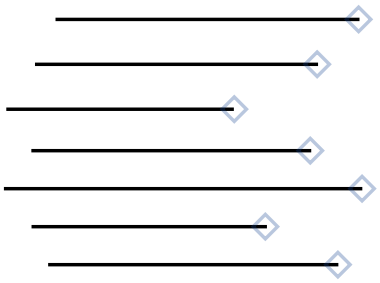
Machine learning offers significant benefits over a purely rules-based approach. Once our models are trained using controlled data, they continue to learn and evolve as they process user information in a real-life environment.

This continual evolvement of our models is especially critical given the increasing sophistication of fraudsters, who tirelessly develop new ways to circumvent existing technology. Rather than playing catch up, as is the case with a purely rules-based approach, our models remain several steps ahead by evolving as new fraudulent practices emerge.

Training the machine

When training our machine learning models with sample data we go through a five-step process:

1. Data scraping

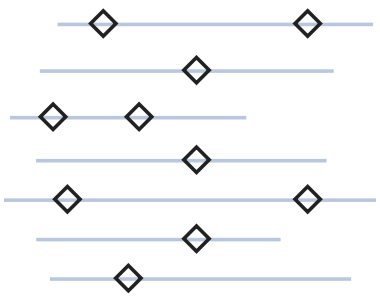


When a user verifies their identity with Veridu, they are asked to sign in to one or more of their social or online accounts and to grant us permission to access the data contained within these. We instantly scrape, or gather, this data using APIs.

> *Veridu puts the user in control of the data they share, providing us with access to data beyond what's available on public profiles.*

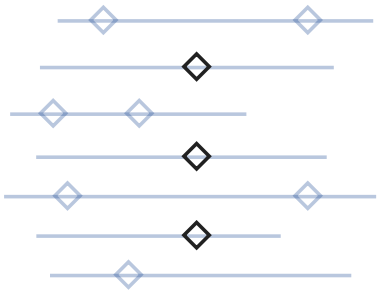
It's important to note that our consent-driven approach means that the information we collect goes much deeper than what appears on a user's public profile. Depending on the accounts a user has verified themselves with we collect information including their posts, comments, activities, playlists, location, and more.

2. Data cleansing



Following the data scraping step we're left with a mass of raw, unstructured data that we need to make sense of. We do this by cleansing the data and structuring it into a standard format, turning the raw data into facts like 'first name', 'last name', 'gender', 'location', and 'age'.

When it comes to machine learning, if you put rubbish in you'll get rubbish out, and this step ensures we never get into that situation. By identifying and marking any missing facts (for example, perhaps none of the accounts used by a user to verify themselves contained a date of birth), we train our models using only the highest quality data.



3. Feature extraction

This is one of the most critical aspects of a machine learning pipeline. In our scenario, we obtain raw data from a user's social and online accounts, which is made up of a mass of unstructured textual and image data, such as a user's posts, comments, likes, images, tags, and more.

> *Using online activity including social media posts, images and comments Veridu can instantly verify a user's identity.*

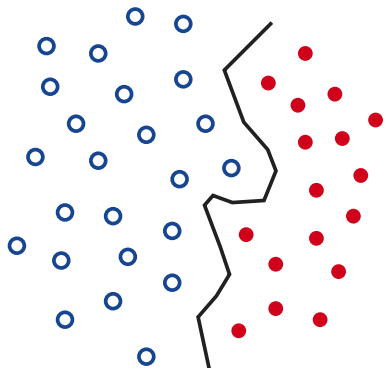
During this learning step we compute features that serve as structured input to our models. These features can be composed of numerical, categorical and binary values, and can be described as an individual measurable property of a phenomenon being observed[1].

Let's take the example of a user's name. First, we scrape a user's online accounts, before cleansing and structuring the data into granular facts, such as 'First name on Facebook' and 'First name on Google'. At this point, however, we have no way of knowing if the user is actually a fraudster using fake details to commit their crime.

To assess the likelihood that this is actually the user's real name, we train our model using the set of features we have computed. One example of a binary feature is "does the first name on Facebook match the first name on Google?". An example of a numeric-based feature around name is the number of comments a user has received on his posts which mention his name.

These are just simple examples of features. Veridu computes hundreds of other features from the raw data we collect, such as how active a profile is, how information from different sources correlate with each other, and many more. All of these features are then used during our model training step.

4. Model training

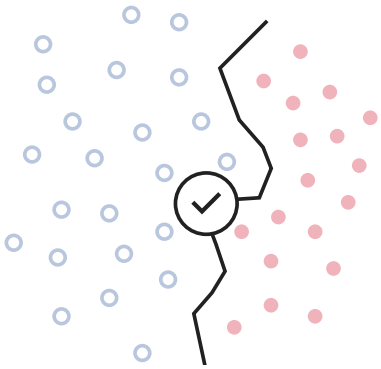


This is where things get really interesting. We now build a model to assess our confidence in the user's credibility, based on the known real and fake data samples we have collected. We use a set of learning models to do this, one of the main ones being neural networks.

> *A neural network is a model inspired by the way our brains work, with a set of connected neurons that fire when a particular input is received.*

Neural networks explore this idea by building a set of connected neurons which are trained via a mathematical optimisation technique called gradient descent. By using a set of training data containing known real users and known fake users, we can tell the model when it's right, and when it's wrong, allowing it to continually learn to reduce any output error and become highly accurate.

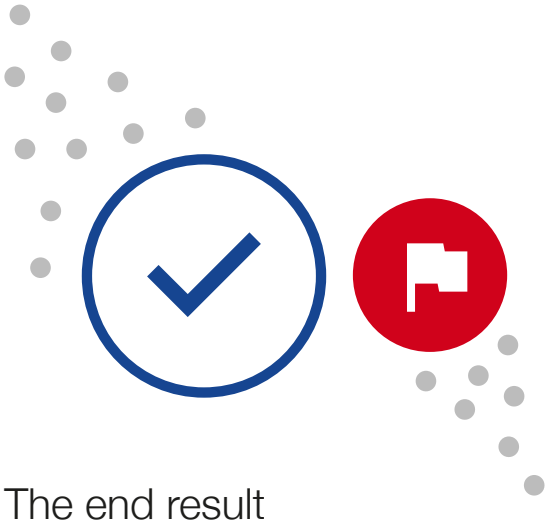
[1] *https://en.wikipedia.org/wiki/Feature_(machine_learning)*



5. Model evaluation

The final step is to put our model to the test to ensure it is learning as we expect. We do this using a statistical technique called cross validation.

Cross validation is the process of training our model on one subset of data, and then testing it using a different subset. This process is repeated many times using different subsets of data for training and testing. By doing this, we can be sure that our models are smart enough to accurately analyse all new data coming in. If we're happy with the results of the evaluation step, we have our final model.



The end result

When a user verifies with Veridu, we use our trained models to calculate a credibility probability, which is then turned into a binary decision - "is this profile fake or real"?

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