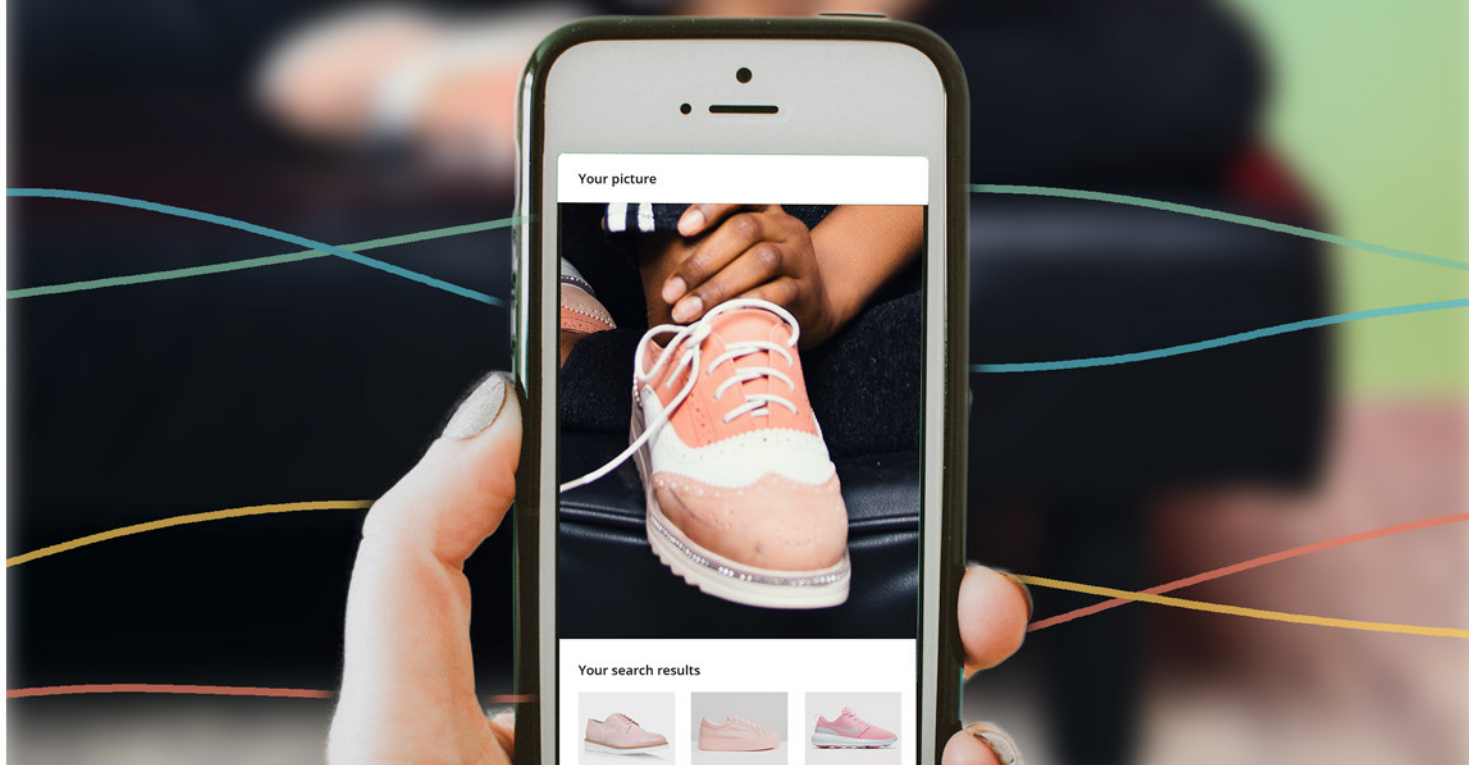


VISUAL

A picture is worth a thousand queries



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Over the last few years, visual content has been slowly replacing text to reach its current position as the most important online content. Social networks have been leading the way with this concept shift; in the last year, Instagram's active user base grew by 64% and that of Pinterest by an incredible 111%.

We've spent the last few years getting used to this richness in visuals and imagery and it's not surprising that it's now also affecting the way we think, interact and shop.

Many eCommerce companies have already taken measures to place imagery as a number one priority. Our own consumer research revealed that 52% of shoppers say product images are the most important aspect of an online experience.

It's perhaps unsurprising then that this notion of visual content supremacy is naturally transitioning across into eCommerce and shoppers' minds and with it a desire for **a new search trend focussed on image**. One that not only enhances but also simplifies the search experience.

The once incredible possibility of buying a product using just an image has become a reality. Take a photo of a skirt you like in a magazine or on the street and that product can be on its way to you within minutes.

EmpathyVisual gives your search the power of sight.



INSIDE THE TECHNOLOGY

EmpathyVisual has been designed to identify and recognise products using both their colour and their form which means it can automatically classify and tag them using their colour properties and catalogue categories.

This means relevancy and findability, our core metric for measuring if customers are able to find what they're looking for

easily and quickly, increases for a more seamless and enjoyable digital shopping experience.

Additionally, EmpathyVisual facilitates backend tasks by automating categorisation and labelling, often one of the most timely and costly eCommerce tasks within product descriptions and tagging.

Colour identification

Images typically contain thousands of colours and sometimes it's difficult to define a product description, tag or filter using a single colour alone.

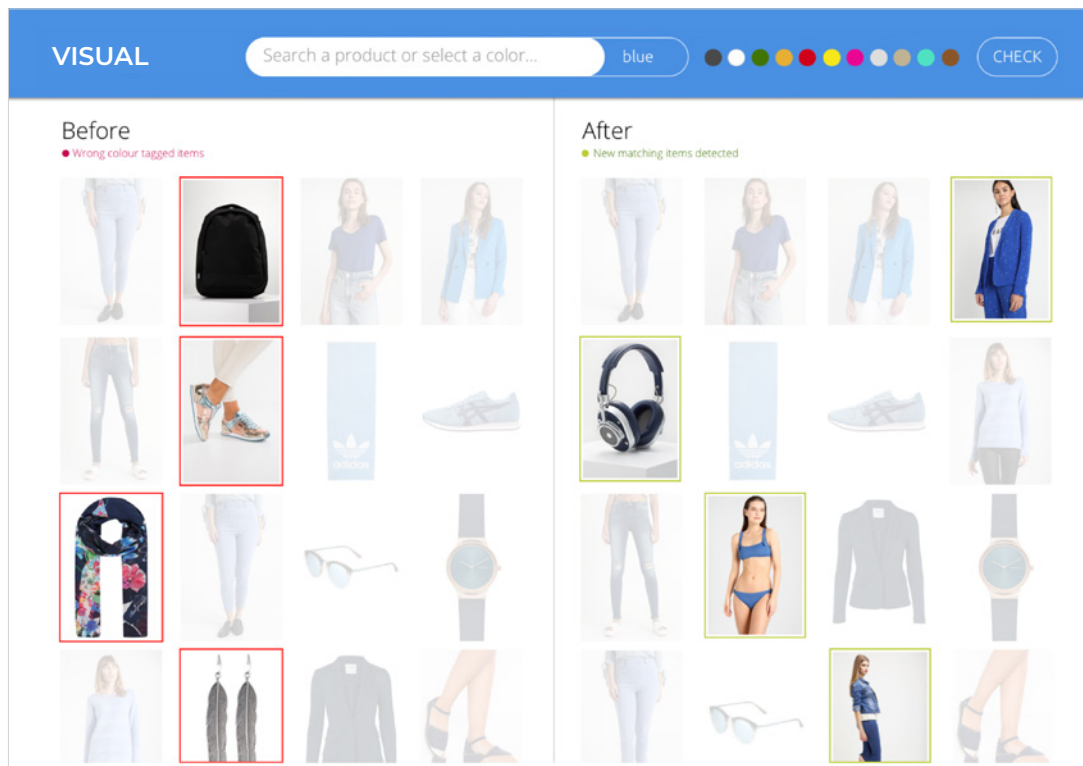
This is especially true with clothing catalogues; the variety of colours and tones of each garment is often one of the challenges in generating a successful search result from a customer query.

EmpathyVisual closes the gap between how people look for a product or refer to a specific colour within a search box,

and how this product or colour has been tagged and described in the catalogue.

Under this scope, EmpathyVisual extracts the predominant colour for each article through digital colour quantisation techniques.

Images are pre-processed and grouped putting similar pixels together so that, when searching for a particular colour, articles will be automatically scanned and collected to then appear on the results pages.



EmpathyVisual extracts only the predominant colour from each item to exclude other elements from the image recognition.

BACKGROUND SEGMENTATION

In order to detect only the predominant shade, EmpathyVisual separates and isolates it from the background colours, gradients, indoors scenario and so on.

It uses several techniques to do this, such as GrabCut, Watershed and Floodfill, with GrabCut being the most important one.

The GrabCut algorithm places different rectangles over the image to undertake an initial labelling and then uses probabilistic functions to identify the probable foreground, and the probable background.

The uniqueness of this approach means that EmpathyVisual is able to scan the image for contours, identify the most plausible location and then run GrabCut based on those geometric points.



SKIN DETECTION

The skin tone also needs to be excluded from the colour detector. This is done by creating a skin dataset collected by sampling RGB values from the face images of various age groups (young, middle-aged and senior), race groups (asian, black, latino, white...) as well as genders.

Using the data coded in the RGB colour space, a specially trained machine learning model is able to identify skin pixels and non-skin pixels, and set a mask over those geometric points on the part of the image that corresponds to bare skin such as arms, legs and faces.

Category identification

Visual search technology also allows products to be filtered and categorised not just by their colour or product tag but also by recognising their form and identifying the main pixels of the image.

EmpathyVisual is able to determine and distinguish different clothing categories and subcategories, improving the efficiency and accuracy of product tagging and solving many of the

findability issues that can arise due to mistakes within catalogue and product descriptions.

This helps to improve the relevancy of search sessions while enhancing the customer experience, and it also improves the catalogue categorisation and labelling functions that are an essential aspect within every eCommerce store.



WOMEN SHOES

MEN SHOES

KID SHOES

BOOTS

SNEAKERS

SANDALS

FLATS

LOW-HEEL

MID-HEEL

HIGH HEEL



THE BENEFITS ARE CLEAR

There are many benefits of visual search within eCommerce, for both consumers and retailers, with improvements to the customer experience as well as cost and time efficiency through automation.

Connects customers more directly to the eCommerce catalogue

Using a **picture instead of a typed query** is **much more precise** and the results will correspond more accurately to what is being searched.

Visual search allows consumers to find a product independently of the source of inspiration in which the item was discovered; be it a printed magazine, street style trends or a social network. It displays either the exact product or very similar products while increasing the **findability rate**, the ranking of the most relevant products on the results page.

Moreover, it's not always easy for customers to describe with words the specific product they have in mind. Different shoppers will most likely describe an item in a different way and each eCommerce site will also use their own descriptive terminology.

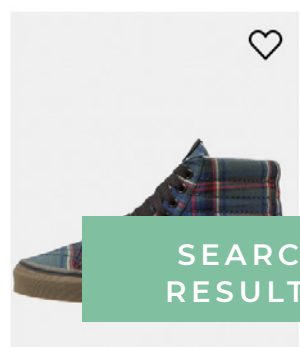
By incorporating image recognition technology into the search feature, the connection between the **customer need** and the **product catalogue** is not only easier and more straightforward but it's



Converse
CHUCK 70 - High-top trai...
~~£84.99~~ **£63.74**



Converse
CHUCK 70 - High-top train...
~~£84.99~~ **£67.99**



A customer might be looking for 'checkered shoes' but the results from the typed query may not align or match with the desired product.



Shoes



With visual search, available from the search box, the query is much more precise and results will correspond more accurately to what is being searched.

also much more effective and accurate. It also provides the exact match as the first option if the product in the picture is in stock.

Image recognition is also a useful tool as part of an **omnichannel strategy**. It supports the physical store in a similar way that a customer might search using a bar code or a reference number on their phone to find stock availability online.

In fact, by far the quickest way to purchase an item that's unavailable in store is to take a photo of the item, rather than typing a description or having a guess at what you think the product may be called, and then immediately checking its online availability in the size or colour you want.

Find similar products and be inspired

Shoppers increasingly **want to be inspired and receive recommendations** or style ideas and here is where visual search can not only guide the discovery but can also offer relevant recommendations while avoiding unrelated results.

By taking or uploading a picture of a product a customer can receive lots of results with **similar products matching the attributes in the picture**. This enhances the discovery of related products by showing alternatives they may not have realised existed in the same



£35.00



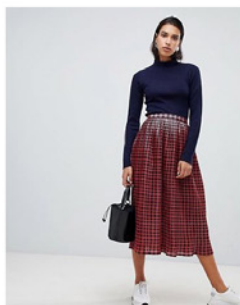
ASOS DESIGN Petite dobby pleated high low midi skirt wi...



£17.50
£35.00



ASOS DESIGN dobby pleated high low midi skirt with pintuc...



colour or category. A fashion retailer could even offer a 'shop-the-look' service offering different clothing categories from one picture.

Colour-matching is also a useful functionality of image recognition as it offers recommendations that are automated by filtering through a broader palette of colour shades.

Product tagging and content curation

EmpathyVisual is able to infer from products images the **relevant category tags** and product attributes, i.e. the type of clothing, colour, fit/shapes, and so on during the upload process.

This means that every product can be automatically **identified, categorized, classified and tagged** in the backend. This is extremely useful for retailers as it's much more efficient, cost-effective and less labour intensive while improving and speeding up the catalogue management.

The tagging assistance provided by EmpathyVisual also **improves the relevancy of the results** and therefore their findability. This is due to each image being classified according to the



Manual backend tagging and classification is costly and time intensive

predominance of its visual aspects such as style, colour range or even the occasion the product is suitable for.

Another advantage in the backend of image recognition is the **automated identification of related tags** in order to refine the initial query. This means that when a search is typed and different products are selected, related tags can be populated automatically by extracting the visual aspects and attributes.

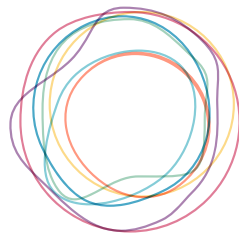
This helps users to narrow down and refine their query during the search process. By recognising the colour and main attributes of the picture, EmpathyVisual can automatically produce the main tags for each product

to either shorten the results offered or extend them.

EmpathyVisual offers a new world where shoppers no longer need to describe what they're looking for, they can simply show it. A world where simplicity, ease and speed combine with accuracy, relevancy and findability.

Where people not only find what they're looking for effortlessly but feel inspired by recommendations and leave the online store with a smile on their face. This is a world where not only is the customer experience more enjoyable but the retailer improves their cost, time and labour efficiency too. You could say it's a win win.

See more with EmpathyVisual.



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