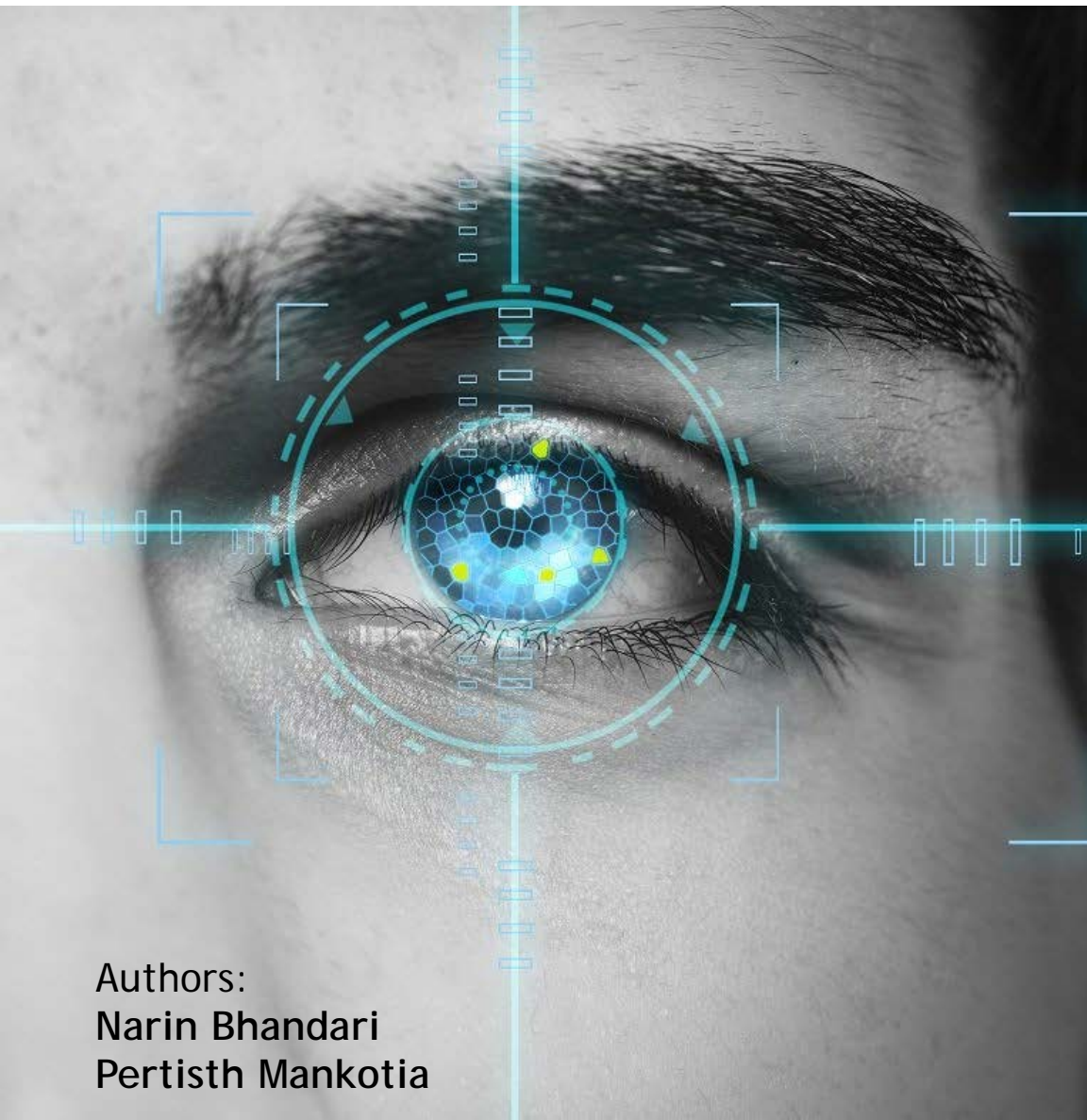# Image Analytics: The Third Eye

Empower Your Enterprise With Image Analytics

Authors:
Narin Bhandari
Pertisth Mankotia

Prologue

From the caveman to the renaissance painters, from a 3-year-old child's drawing to the engineer's blueprint of a skyscraper; 'Images' have ruled the world. These visual elements have proved that they are more than a brush-stroke or a spot of colours. Images have packed stories, information, war-codes, insights and foresights so cleverly and discreetly for all these centuries that it is impossible to imagine a world without an image.

Thankfully, their power and value have started making their way from royal walls, museum corridors and art galleries to the mainstream enterprise. Today an image can be a one-shot treasure-chest of a lot of data and information. They are capturing faces. They are tracking intricate refinery pipelines. They are accompanying a shopper's random trajectory. They are helping everyone – from governments, to plant engineers, to marketers to customers – in making better decisions. And truth be told – they can be of help to a lot more eyes and ears.

Let's understand the genesis and ultimate tangent of this power. What makes a picture speak not just a thousand words, but a zillion insights? And does this power matter to your enterprise and life? Let's find out.

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The Blank Page: Birth of an Image

Photograph, per se is derived from the Greek photos ("light") and graphein ("to draw") and was, supposedly, first used in the 1830s.

A lot of narratives dot the pages of history on the journey of an image. The most interesting, and the most noteworthy, tipping point in this journey is that of recording an object as an image by using light, radiation, or some light-sensitive material.

From the 16th century (Giambattista della Porta) to 1727 (Johann Heinrich Schulze), from lithography, to heliography, the photograph kept morphing in new forms. Louis Jacques Mande Daguerre in 1837 was successful in fixing an image permanently and with high fidelity and detail. Thus began the genre called Daguerretype. It was in 1833 that the French-born photographer Hercules Florence produced prints of drawings – this process was called "photography."

From the calotype to stereographs, from the use of glass negatives and carte-de-visite to the arrival of George Eastman's Kodak Camera, the impact of a visual image has travelled many decades. As MIT also noted, the human brain can process entire images that the eyes see within 13 milliseconds. Visual content is always more condensed, engaging, and vocal when it comes to packing a lot to say in a few shots.

Businesses have been using the power of an image through every possible mode even in earlier generations. They have used charts, tables, and grids and what not. But today's images pack a lot more. They can be created by assimilating a lot of data in a compact form. This data is not just data - it is information wrapped in a real-time and draped in contextual colour.
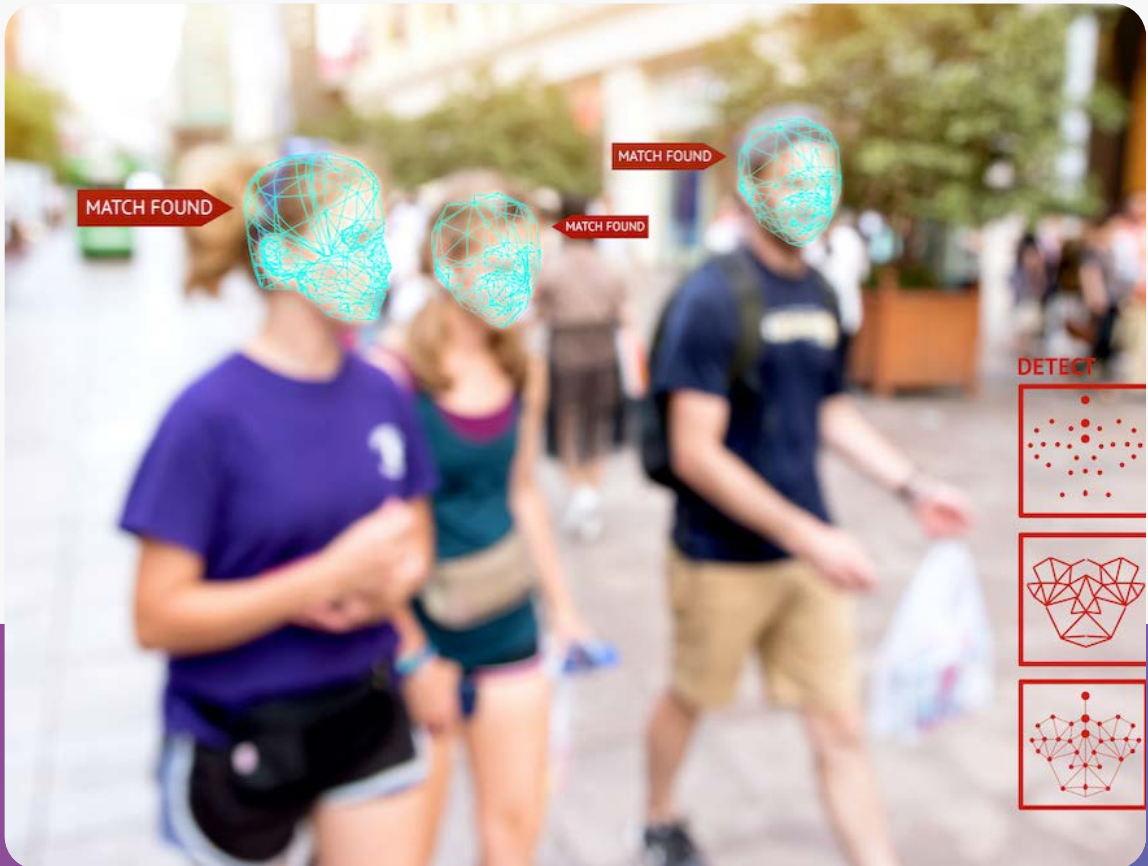
This explains why 'Image Analytics' is so popular, and so relevant, for enterprises today. These images are intelligently-generated and captured with precision. The deep and easily-accessible image data allows for automatic algorithmic extraction and logical analysis of information. And today this data comes in myriad forms - it is available as barcodes, QR codes, facial recognition, geospatial images, and as real-time position and movement analysis.

An Image's Journey – From Decoration to Data

We know that an image today is more than a mercurial selfie or Instagram fodder. For enterprises, the connotation of an image is very wide and long-term. Supported in closely-embedded ways by technologies like machine learning, artificial intelligence capabilities, deep neural networks, these images have traversed new levels of identification, pattern recognition and decision-enablement.

Here are some drivers that make 'images' such important investment pockets for businesses:

Advances in security and surveillance aligned with high-definition identification techniques

Software-related breakthroughs specially in intelligence, analysis, and visualization

Sophistication of edge video analytics

Tools and APIs for content discoverability and accelerating text extraction

Improvement in computer graphics

Disruptive improvements in facial search capabilities and facial analysis for detection, analyzing, and comparing faces

Improvement in accessory devices and hardware like drones, satellites, cameras, sensors, UAVs, image storage and management

Advancement in augmented reality, contextual videos, sound, 360° panoramas, 3D animations, and text

The Multi-faceted Rainbow:

Various segments, applications and use-fields of Image Analytics

The Image Analytics space is being constantly enriched with new segments and innovations. Let us take a quick look at some core components and then walk through some top usage areas of image-based technologies

Key segments of this technology market:

Object recognition

QR/barcode recognition

Pattern recognition

Facial recognition

Optical character recognition

Imaging hardware and software

Imaging Services: On-premise and cloud-based

RPA: Robotic Process Automation

It is staggering to simply read the umpteen and unimaginable ways in which these technologies are being leveraged by enterprises – and of all kinds of verticals in their respective business-problem areas. They are augmenting their security levels, strengthening their proactive stance on many areas and, hence, cutting costs and wastage of time/money/human resources. But they have also gone a step ahead. Some of them are already exploiting the power of an image for better customer understanding, intimacy and insight. They are, thus, using images as new sources of customer value and revenues.

Here are some applications that are already delivering results:

- Image-based predictive maintenance and risk-control at oil refineries
- IoT-image embedded solutions for plant management and machinery control
- Social media monitoring and visual for digital marketing applications
- Facial recognition at law enforcement agencies
- Face remembrance technology for contactless travel and airport security checkpoints
- Tracking of fixed assets in heavy industries, high-risk industries like remote plants and refineries
- Use of drones for timely, accurate, and high-resolution data collection for mapping and surveys
- Facial recognition applications for user verification and public safety

- Augmented reality in consumer experience applications like real-estate, luxury shopping, adventure sports, museums etc.
- Augmented reality images for product display, entertainment, and deeper interactions
- Digital image processing for retail analytics, in-store execution, real-time merchandising recommendations, digital payments etc.
- AI-enabled image recognition for contextually relevant advertisements
- Facial Emotion Recognition for tracking movement, footfalls and buyer psychology at retail points
- Fast stock replenishments by capturing shelf images and using retail environment scans
- Image-based employee identification & attendance systems

The global image recognition market size is projected to reach USD 81.88 billion by 2026.

Source: Fortune Business Insights

As we can see, an image is a goldmine of power. Insurers can use images of damaged vehicles to shrink verification hours and improve claim processing while also making customers happy. Online shoppers can search for a desired product by just clicking a picture that can be uploaded on AI-powered apps. Mining companies can detect a new mineral source by using nothing but drones. A city municipal council can know exactly where garbage is piling up by seeing a dustbin's image. An autonomous car can detect obstacles and warn the driver by reading stoplights and road signs. A retailer can know exact ups and downs in inventory and sales by looking at shelf images for real-time key performance indicators. An airport can use facial recognition for empowering a passenger with self-service check-in, or for tracing missing passengers during a boarding call. You see, an image is such a big source of customer insight and business knowledge that it would be imprudent to waste the power that is just a click away.

Untapped Canvases: Emerging Application Areas

Of course, many industries have dug deep into the power of image analytics in the last five-six years. But a lot remains to be explored. What if images can also tell us about emotions? What if images can also alert marketers about customer dissatisfaction? What if micro-expressions can help inform law authorities or immigration officials about bad elements? What if drones could pick red-flag areas and help cops before a crime happens? What if disaster management can be made truly proactive with advanced image analytics?

The geospatial technology market is a good case in point. The Geospatial Imagery Analytics Market size touched USD 2 billion in 2018 and is growing at a CAGR of 20% from 2019 to 2025. It is projected to hit approximately USD 8 billion by 2025 (Global Market Insights). The most dominant use here can happen by government authorities that are trying to bolster their disaster management readiness with satellites and GIS. Also, transportation and logistics sectors can deepen the use of geospatial data to optimize fleet operations, and plan around tricky traffic congestions. Plus, mining companies can really invest more in using these images for smart mineral exploration, mine construction, and safety.

Don't Stay Colour Blind: Challenges and Possibilities

For image analytics to realize its actual and extreme potential; we need both – courageous innovators and even more courageous business users.

Right now, a lot of constraints remain that hamper the true trajectory of image analytics:

- Presence of too much structured and unstructured data in images
- Fragmented data sources
- Preponderance of low-resolution image size and storage
- High cost of image recognition systems
- Huge cost of development of complementary software for image-related processes - like BI, CRM, ERP etc.
- Lack of high-definition pictures and videos on an average level
- Heavy data-transfer requirements and huge disk space needs for most images. This challenge, often, gets compounded with barriers of processing speed and network issues
- Limitations of accuracy, integrity, and real-time delivery
- Privacy concerns that have exploded with the rise of third-party marketplaces of image data
- Huge efforts and costs for data cleaning and hardware processing that are compounded with time, complexity, and cost associated with software for image identification and development as well
- Ignorance of the possible use areas of images – mindset blocks and resistance on technology

Conclusion

As you can surmise, the world has only scratched the surface of 'Image Analytics'. There is so much that is possible by using the depth, precision, context, and intelligence that an image packs. Doing so is bound to fetch huge returns and new levels of customer intimacy and service. But doing so should be easy, effortless and not unwieldy when we think of all the software, equipment, brain-ware and models that would come into play. As an enterprise you should not be replicating the application idea of some other vertical. Your 'Image Analytics break-out moment' should be unique and apt for your business problems. It should fit your needs, goals, IT legacy, and costs.

Partners like Staqo are constantly working to build this expertise and application-specific approach to 'Image Analytics'. The teams here are excited about image technologies but also conversant with the upstream and downstream sides of these new investments.

For instance, Staqo has blended the brilliance of imaging technology into some real-industry applications in a very clever and pragmatic way. In a recent proof of its many capabilities in this area, Staqo

helped a large enterprise apply visual merchandising to amplify overall marketing efforts and elevate long-term customer value. With the use of the right image analytics at the right points, this enterprise's retail executives could identify point of maximum customer interaction. They could grasp the blind spots/missing spots along with potential spots of revenue maximization without any delay or inaccuracy. This technology translated into a deeper and more intimate customer experience because its teams could track customer moods and preferences. They could do so quickly and precisely enough for immediate store-experience impact that, in turn, added to long-haul customer loyalty.

What Staqo does with a distinct expertise is that it brings a diverse set of tools to the table – that have an impressive level of template versatility, good data-set orientation, proficiency in image quality, and deployment ease. Staqo's enterprise market experience also allows our teams to bring scalability, context and the right algorithmic fit to a given organization as per their unique needs for image analytics. It captures the potential of images and converts it into tangible value in every area – costs, revenues, customer service and innovative services.

The idea is to make 'Image Analytics' deliver compelling and visible value without any invisible burdens. The idea is simple – it should click!

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For more information on how Staqo can help your organization with Image Analytics, please reach us at **contactus@staqo.com**

www.staqo.com

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