

Computer Vision: A Game Changer for Banking, Financial Services and Insurance

Abstract

Computer vision is the new buzzword in the technology world. The technology has been leveraged to create path-breaking innovations like self-driving cars and enable the facial unlock feature in mobile devices for increased security. In the banking, financial services and insurance (BFSI) industry too, computer vision can be utilized in areas like fraud control, authentication, data extraction and more to enhance customer experience, improve security, and increase operational efficiency. This paper discusses the potential of computer vision to reimagine the BFSI industry and highlights use cases from various lines of business (LoB) where the technology can potentially be adopted.

Computer Vision: The Journey So Far

Computer vision technology enables computers or other machines to visualize and analyze digital images, videos, and other visual inputs. The machine makes decisions or takes appropriate action based on this analysis. In the 1960s, artificial intelligence (AI) became an academic discipline and researchers tried to make the computer as intelligent as a human being. Later in the 1970s, computer vision received its first recognition in the commercial space with the application of optical character recognition (OCR) techniques to extract data from scanned images.

Until the advent of deep learning, computer vision had limited application in real world situations as training and configuring the machine required great manual effort. For example, to develop facial recognition capability, developers had to analyze individual images, and extract features by manually measuring the distance between the different parts of the face such as eyes, upper lip, nose, and so on. Due to the enormous manual effort and scope for errors, the use of computer vision technologies in real life scenarios was limited.

Advancements in AI have offered a new direction to solve the problems associated with harnessing the power of computer vision technologies. Statistical learning algorithms can be programmed to enable precise image analysis and accurate feature extraction. In addition, the availability of abundant data and advanced computing infrastructure has made the use of computer vision technology for real world applications more feasible. Adoption of computer vision is therefore growing in industries ranging from agriculture to automotive.

Computer Vision Applications in Banking and Insurance

Several industries are using the computer vision technology in different ways. We might have even experienced computer vision in our daily life without recognizing it. Unlocking mobile devices through facial images, using Google lens to translate content in real time, and automatic tagging of friends in pictures uploaded on social media sites like Facebook or Instagram are all examples of computer vision in action. Path breaking applications of computer vision technology include Tesla's self-driving cars, Amazon's grab-and-go stores without checkout lines, and improved accuracy in medical diagnosis through detailed analysis of images from x-rays and MRI scans.

A technology with the cognitive skill to 'see' (like humans), identify, authenticate, understand, and extract information will usher in a revolution in the BFSI industry across areas like security, fraud control, sentiment analysis, customer experience management, and back- and front-office processing. In our view, the BFSI industry must harness the power of computer vision technology across the value chain. Applying computer vision techniques can also resolve some longstanding challenges of the BFSI industry and deliver key benefits in areas like cybersecurity, customer experience management, sentiment analysis, and customer identification and authentication. There are several use cases across retail banking, commercial banking, and insurance where the adoption of computer vision can reimagine the business and create exponential value (see Figure 1).

Table 1: Potential BFSI Use Cases for Computer Vision Technologies

Focus area		Fraud prevention	Data extraction from physical documents	Customer experience
Retail Banking	▲ Customer facial identification	X		X
	▲ Advanced data extraction from documents		X	X
	▲ Know Your Customer (KYC)	X	X	X
	▲ Channel sentiment analysis			X
	▲ Customer Authentication	X		X
Commercial Banking	▲ Data extraction from trade documents		X	X
	▲ Data extraction from commercial loan documents		X	X
Insurance	▲ Evaluation of assets	X	X	X
	▲ Damage assessment	X	X	X
	▲ Data extraction from insurance documents		X	X

Figure 1: Banking and Insurance Use Cases for Computer Vision Technologies

Retail Banking

The scope for adopting computer vision in retail banking is huge. Furthermore, it has the potential to deliver immense business benefits across cost and efficiency optimization and customer experience.

Security and fraud control

Using computer vision techniques like facial recognition and biometric authentication can help banks improve security and better combat fraud. CaxiaBank allows its customers to use facial recognition technology to draw cash from its ATMs improving user experience and enhancing security.¹

KYC processing and onboarding

Computer vision can enhance Know Your Customer (KYC) processing by enabling banks to effectively search and match customer pictures to identify adverse media reporting and negative information on the web and social media. Spanish bank, BBVA, S.A., has launched 'online onboarding' where customers submit a photo ID and a selfie and BBVA uses face recognition process to confirm that both the images are the same.²

In addition, KYC processing, onboarding, mortgage, credit card initiation, loan origination and many other tasks are paper-based and require manual effort to scan, store, classify, and extract data often resulting in errors and adverse impact on process efficiency. Computer vision can help automate document classification and data extraction process to enhance efficiency and accuracy.

Smarter branches

Computer vision can help banks improve the in-branch experience. For instance, customers can be identified as they walk into the branch by comparing their image from the camera positioned at the entry point with the image in the records. With the aid of insights gained from analytics, banks can predict the reason for the customer's visit to the branch and proactively deliver personalized and contextual service while also identifying opportunities for cross-sell and up-sell. In addition, analyzing customer sentiments (facial expressions) as they interact with the branch personnel can yield valuable insights to improve service and experience. Computer vision backed analysis of images and videos (facial expression, activity pattern) can flag potential fraudulent activities like card skimming, theft and so on.

Commercial Banking

Commercial banks have traditionally used OCR software to automate document classification and data extraction from scanned documents. The existing OCR system works on rules and templates and has a long training process because each individual variation needs to be trained and configured afresh. Even a slight deviation in the templates might potentially result in exceptions or compromise accuracy in data extraction. A

large multinational bank could achieve less than 70% accuracy in data extraction using OCR even after many years due to huge variations in the documents received from multiple entities. Opting for computer vision based OCR tools such as Amazon Rekognition, Google's Vision API and Azure Computer Vision that can 'read' unstructured documents in varying templates and automate document classification, data extraction, and processing will significantly increase the accuracy levels.

Insurance

Use cases for computer vision adoption abound in the insurance industry as well. For instance, in property and casualty insurance, computer vision can help insurance companies remotely analyze images of properties to access granular details such as the condition of the exterior and so on at the time of underwriting thereby drastically reducing the need for physical inspection. Depending on these aspects, insurers can offer differentiated premiums to the customers. For damage claims, based on the image of the damaged goods, insurers can leverage computer vision to remotely extract granular details from images and estimate the damage value using machine learning algorithms.

Future of Computer Vision in the BFSI Industry

While computer vision is still evolving, the potential is clear. The ability of computer vision to visualize and analyze millions of images in a fraction of the time it takes humans is unique. Moreover, a system backed by computer vision can 'see' things in great detail and analyze a large number of images without getting overwhelmed or compromising accuracy. We believe the future of computer vision is promising and banks and insurers must explore the best possible way to adopt this technology and embed it into their value chain. However, adoption comes with its own set of challenges around accuracy and data quality though there have been tremendous improvements. While the amount of visual data has been growing exponentially, the compute power required to analyze the data is now more affordable. With the easy availability of new hardware and AI algorithms, computer vision has grown and matured to enable enterprise-wide adoption. Big technology companies such as IBM, Google, Amazon and Microsoft Corporation are investing heavily to offer computer-vision software development services. They offer pre-built trained models as part of their cloud offering in the software-as-a-service (SaaS) model, which will enable faster deployment.

Looking Ahead

Given its potential to unlock value through cost and efficiency optimization, improved customer experience, and better fraud control, we believe that BFSI firms must incorporate computer vision technology into their digital transformation strategies to gain an edge over the competition. Before embarking on implementation, however, firms must evaluate and select the best software, ensure compliance with privacy regulations such as the General Data Protection Regulation as well as internal security policies, and consider moving to a cloud platform. Given the complexities involved in adoption, firms must look at partnering with a service provider post a detailed market analysis.

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