American Journal of Artificial Intelligence and computing

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

Artificial Intelligence in Computer Vision: Methods and Applications Review

Tsendayush Erdenetsogt[1*], Mehtab Jamal[2]

[1]University of the Potomac, USA

[2]Gomal University, Pakistan

[1]Tsendayush.Erdenetsogt@student.potomac.edu, [2]Mehtabbinjamal@gmail.com

open access

Corresponding Author
Tsendayush Erdenetsogt
Tsendayush.Erdenetsogt@student.potomac.edu

Article History:
Submitted: 13-03-2026
Accepted: 20-04-2026
Published: 25-04-2026

Keywords:
Artificial Intelligence, Computer Vision, Deep Learning, Convolutional Neural Networks, Machine Learning, Image Processing.

ABSTRACT

Artificial intelligence-based computer vision is an emerging technology that enables computers to see. This paper reviews the methods of artificial intelligence in computer vision including machine learning, deep learning, convolutional neural networks and transfer learning, and applications of such technology in object detection, facial recognition, medical image analysis, autonomous vehicles and security. It also explains the performance measures, issues such as bias, complexity and ethical concerns and future technologies such as vision transformers and multimodal learning. The study ends with the future of more efficient, explainable and transferable intelligent vision.

INTRODUCTION

Artificial Intelligence (AI) has transformed computer vision in a way that computers can see, understand and interpret visual data in our world in the same way as humans. Computer Vision is an application of artificial intelligence that aims to enable computers to learn from visual data such as images and video. It has evolved from simple image filtering and segmentation to complex deep

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

learning models that can accurately solve difficult vision problems [1]. Computer Vision, through the use of artificial intelligence, is changing the way we perceive and use visual information. Traditionally computer vision systems involved hand engineering of features and rules, which was very laborious and required a lot of expertise [2]. But with the use of machine learning and deep learning, especially Convolutional Neural Networks (CNNs), systems are able to learn hierarchical representation of visual data from massive quantities of data. This has led to a tremendous improvement in image classification, object detection and segmentation and face recognition [3].

AI plays an important role in Computer Vision. In the medical field, AI-driven vision systems are used for medical image diagnosis like tumour detection in MRIs and abnormalities in X-rays. Computer Vision is also critical to build autonomous vehicles to detect people, objects and road signs. Computer Vision systems are also used in security for surveillance, detection and facial recognition. It's also used for crop surveillance and customer and inventory management in retail [4].

Although there's considerable progress with AI for Computer Vision, there are issues. These include the need for large volumes of labelled data, its computational expensive, sensitive to environmental factors (e.g. illumination, occlusion) and surveillance and privacy issues. Research is being undertaken to address these challenges, through efficient algorithms, generalization and ethical AI [5]. Computer Vision and Artificial Intelligence is a technological breakthrough. It is still changing the world, improving automation and increasing machine vision and vision understanding [6].

The integration of Artificial Intelligence with Computer Vision is a significant technological breakthrough that has revolutionized the way machines understand visual data. It has advanced the field from the rule-based image processing to smart data-driven systems that can learn and adapt to the dynamic environment. Thanks to ongoing advancements in algorithms, hardware, and data, AI-enabled Computer Vision is becoming more precise, fast and versatile. Yet, despite its rapid advancements, there is still a need for continued research to overcome the current limitations and to unlock its full potential in various real-world applications.

OVERVIEW OF COMPUTER VISION AND ARTIFICIAL INTELLIGENCE

Computer Vision and Artificial Intelligence are two fields that are concerned with developing computer vision. Computer Vision is a subfield of Artificial Intelligence which focuses on the acquisition, analysis and interpretation of visual information (images and video). Artificial Intelligence is a general term for an approach to creating systems that can perform tasks that are normally associated with human intelligence such as learning, reasoning, decision making and perception [7]. So with AI, we get the intelligence to learn and make decisions, and with Computer Vision we get the ability to see.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

The goal of Computer Vision is to convert vision information into machine understandable form. This involves image acquisition, image pre-processing, feature extraction, pattern recognition and pattern analysis. This has been done by incorporating hand-crafted features such as edges, textures and shapes. However, with AI, particularly machine learning and deep learning, these features are learnt, not engineered [8]. Computer vision is enhanced using Artificial Intelligence Learning techniques. Machine learning allows the system to learn the patterns in the data and deep learning (especially neural networks) allows the system to learn features in a hierarchical way. Thus, the lower layers can learn low level features (edges and colours) and the higher layers can learn high level features (objects and scenes). This type of learning has improved visual recognition [9].

The use of AI and Computer Vision technologies has led to the development of smart systems that can be used to: For instance, object recognition, image classification, facial recognition, optical character recognition (OCR) and scene recognition. They are applied in different areas such as in healthcare for medical diagnosis, of medical images; in the automotive industry to develop autonomous vehicles; and in security for person identification [10].

The other major characteristic of this integration is real-time. The latest Computer Vision systems powered by AI can process and make sense of visuals in real-time, making it great for real-time applications such as robotics and autonomous driving. And thanks to other technologies such as GPUs and edge computing they are also much faster and scalable. And AI and Computer Vision go well together like PB and J. AI enables learning and Computer Vision enables vision. They're the key ingredients to many of our smart apps that are transforming work and our lives [11].

HISTORY OF AI IN COMPUTER VISION

Artificial Intelligence based Computer Vision has been an evolutionary and revolutionary journey, with multiple technological breakthroughs and paradigm shifts. Initially, Computer Vision relied on basic image processing algorithms of the 1960s and 1970s. These were rule-based algorithms and were capable of simple operations like edge extraction, filtering and recognition. These were explicit algorithms, in which image processing rules were defined by experts. These methods worked in ideal environments, but were not robust to noise [12].

Visually-based models began to become more complex in the 1980s and 1990s with the development of statistical models and early machine learning techniques. Models started to be used where people defined salient visual features, such as edges, corners and textures, and then classified them using a machine learning method. Some well-known algorithms for object recognition and classification were Support Vector Machines (SVMs) and k-Nearest Neighbors (k-NN). These were more efficient than other rule-based classifiers, but required feature engineering and were not scalable [13]. Computer

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

vision was next revolutionised in the early 2010s by deep learning. A hierarchy of features was learned from Convolutional Neural Networks (CNNs). The breakthrough was the use of deep learning in the ImageNet challenge that significantly improved image classification. This demonstrated the potential of deep learning to learn complex features from large-scale visual data [14].

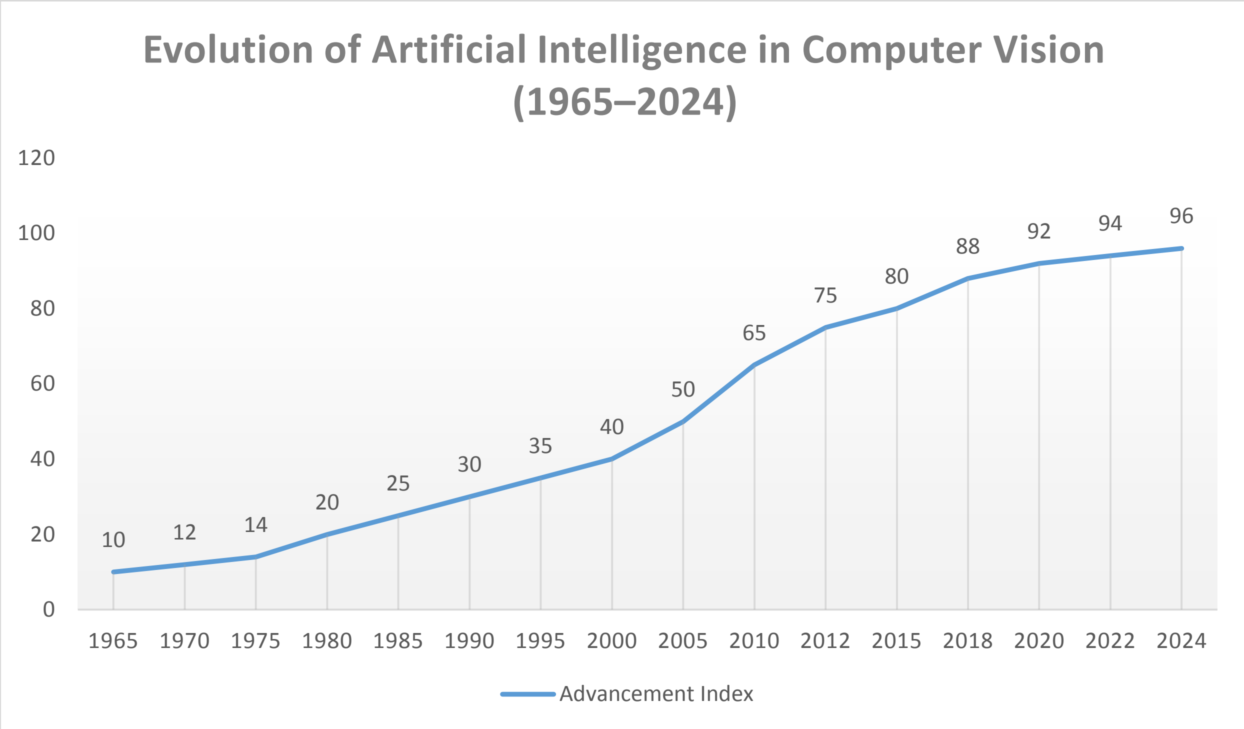

Figure 1. Evolution of Artificial Intelligence in Computer Vision (1965–2024)

Thanks to the increase in computational capabilities, and especially the availability of Graphics Processing Units (GPUs) the deep learning models are more available. This enabled the quick evolution of Computer Vision tasks such as object detection, semantic segmentation and face recognition. The models (AlexNet, VGGNet, ResNet and more recently Transformer models), have also lead to more efficient and effective models, which enables more advanced use cases [15].

The latest Computer Vision breakthroughs with AI have moved from images to video, real-time and multimodal. Models can now use visual information along with other types of information (text, audio) to better recognise. And recent self-supervised and unsupervised learning approaches have removed the need for large data sets for training, leading to quicker training times [16]. Artificial Intelligence-based Computer Vision is an advanced and rapidly growing field. It has evolved from simple rule-based image analysis to deep neural networks, as the field of Artificial Intelligence has developed and as the techniques have been used more in commercial applications [17].

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

KEY TECHNIQUES IN AI-BASED COMPUTER VISION

AI-based Computer Vision techniques are the core techniques used to enable computers to perceive visual data. These range from traditional machine learning to cutting-edge deep learning. They are fundamental to the next-generation Computer Vision technologies that are used in many different industries, such as medical diagnosis, autonomous vehicles, security and manufacturing [18].

Machine Learning Approaches: Prior to deep learning, machine learning played a key role in Computer Vision. In this case, images are transformed to features through feature engineering. For instance, features can be edges, textures, color histograms and shapes [19]. These features are then used for classification using machine learning algorithms such as Support vector machine (SVM), Decision Tree and k-Nearest Neighbors (k-NN). These worked well for simple tasks, but needed features and supervision [20].

Deep Learning Techniques: Deep learning has revolutionized Computer Vision by eliminating the need for features. These features are learnt from the images. Deep learning models learn features in a stack of layers. These have substantially improved the performance for many tasks, such as image segmentation, object detection and face recognition [21]. They are frequently used in state-of-the-art Computer Vision systems as they can learn from large datasets, and from complex patterns.

Convolutional Neural Networks (CNNs): Convolutional Neural Networks are the most popular Computer Vision network. They are used with grid data (images). CNNs use convolutional layers (feature extraction), pooling layers (to reduce the size) and dense layers (classification). This helps CNNs find local and global features. They can be applied to image classification, object detection, medical image processing, natural language processing, self-driving cars and face recognition [22].

$y=f(x)$

Transfer Learning and Pretrained Models: The process of transfer learning with pre-trained models is known as transfer learning. Instead of training a model from scratch, a model that has been trained on another data set (such as ImageNet) is used and then adjusted for use in the new task. It is a time, cost and performance efficient approach especially when there is a lack of data [23]. The most common pretrained models to date are VGGNet, ResNet and Inception and are being applied in Computer Vision. So, AI-powered Computer Vision is built on the technologies of machine learning, deep learning, CNNs and transfer learning. They allow us to learn and process visual data in an efficient, fast and adaptable way to address problems [24].

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

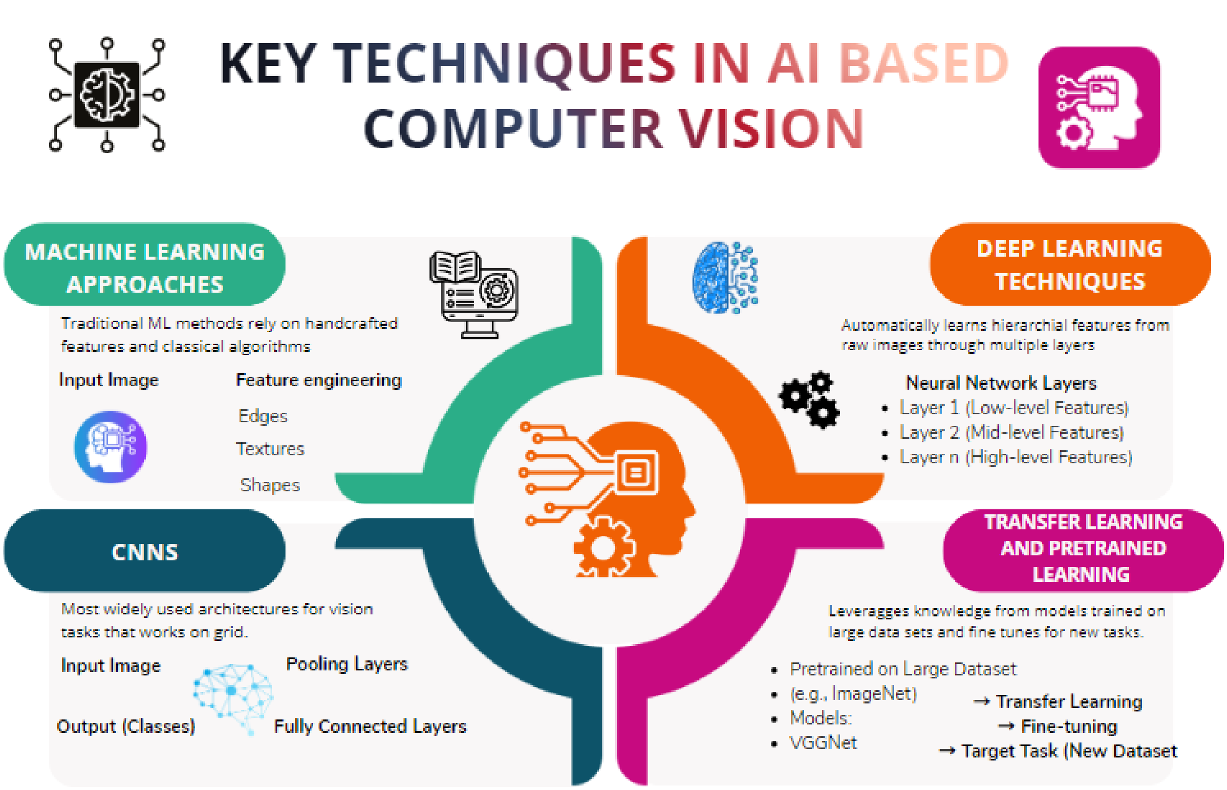

Figure 2. Key techniques in AI based Computer Vision

APPLICATIONS OF COMPUTER VISION

Computer Vision based on Artificial Intelligence has many applications and is transforming our lives. The visual perception and understanding capability of Computer Vision can be used in applications that need to be automated, efficient and precise. The main Computer Vision applications demonstrate its potential and the growth in its usage [25].

Object Detection and Recognition: Object detection and recognition is the identification and recognition of objects in images or videos. This is commonly used in self-driving cars, robots and machinery. Objects can be detected and recognised using machine learning. For example, in vehicles, other vehicles, pedestrians and signs can be identified to enhance safety [26].

Image Classification: Image classification is a traditional Computer Vision task, where an image is classified based on its content. This task has been revolutionized by deep learning, especially CNNs. It's used in applications like automatic image tagging in social media, product detection in e-commerce and remote sensing in the environment [27].

Facial Recognition Systems: Facial recognition is a type of Computer Vision that can be used to verify or recognise people from their face. It has security, mobile phone and surveillance applications. Computer Vision techniques can be used to calculate facial features, such as the distance between the eye, nose and jaw to create an electronic facial map. It has improved security and user experience

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[28].

Medical Image Analysis: Computer Vision is used for medical image analysis. Computer Vision helps in the diagnosis of disease from X-rays, CT scans, MRI scans and ultrasound. They can detect tumours, fractures and infections. This makes the diagnosis more accurate, makes the doctor's job easier and speeds up treatment [29].

Video Surveillance Systems: Computer Vision is also used for security in video surveillance systems. Computer Vision can detect any abnormalities, recognise a person and generate alerts. This removes the requirement for 24/7 monitoring and enables a quicker response. Computer Vision has a wide range of applications [30]. Artificial Intelligence in Computer Vision is changing how we do things in the medical, transportation, security and other industries via new methods of improving speed, accuracy, and automation.

PERFORMANCE EVALUATION METRICS

Performance evaluation metrics are an important part of Artificial Intelligence in Computer Vision systems. Computer vision systems are used in "life and death" applications such as medical diagnosis, autonomous vehicles, video surveillance and automation; therefore, it's necessary to measure their performance. These metrics provide empirical proof of the performance of models in understanding images (or video) and help model development [31].

The most common and straightforward metric is accuracy - the number of times the model gets it right divided by the number of predictions. While accuracy is a simple metric to tell you how well a model performs, it can be misleading in situations where the classes are not equally represented (that is, some classes have more instances than others) [32]. In such cases, accuracy may not be the best means of measuring performance and alternative metrics should be used. In these situations, you would typically report precision and recall. Precision is the fraction of positives that were predicted and recall is the fraction of positives that were detected. For example, precision is more relevant if the cost of false positives is higher than that of false negatives (for example, medical diagnosis) [33]. The F1-score is the harmonic mean (weighted arithmetic mean) of precision and recall. It is the harmonic mean of precision and recall, and is more suitable for the case of unbalanced class distribution.

The higher the F1-score the better the model is at predicting positive cases and avoiding false positives and false negatives [34]. Along with the above, for object detections more complicated measures such as Intersection over Union (IoU) are used to compare the predicted boxes to the ground truth boxes. A confusion matrix is also used. This can be used to look at the true positives, true negatives, false positives and false negatives and provides more information about the model's mistakes. This can be

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

used to see if the model is combining classes or in some cases [35].

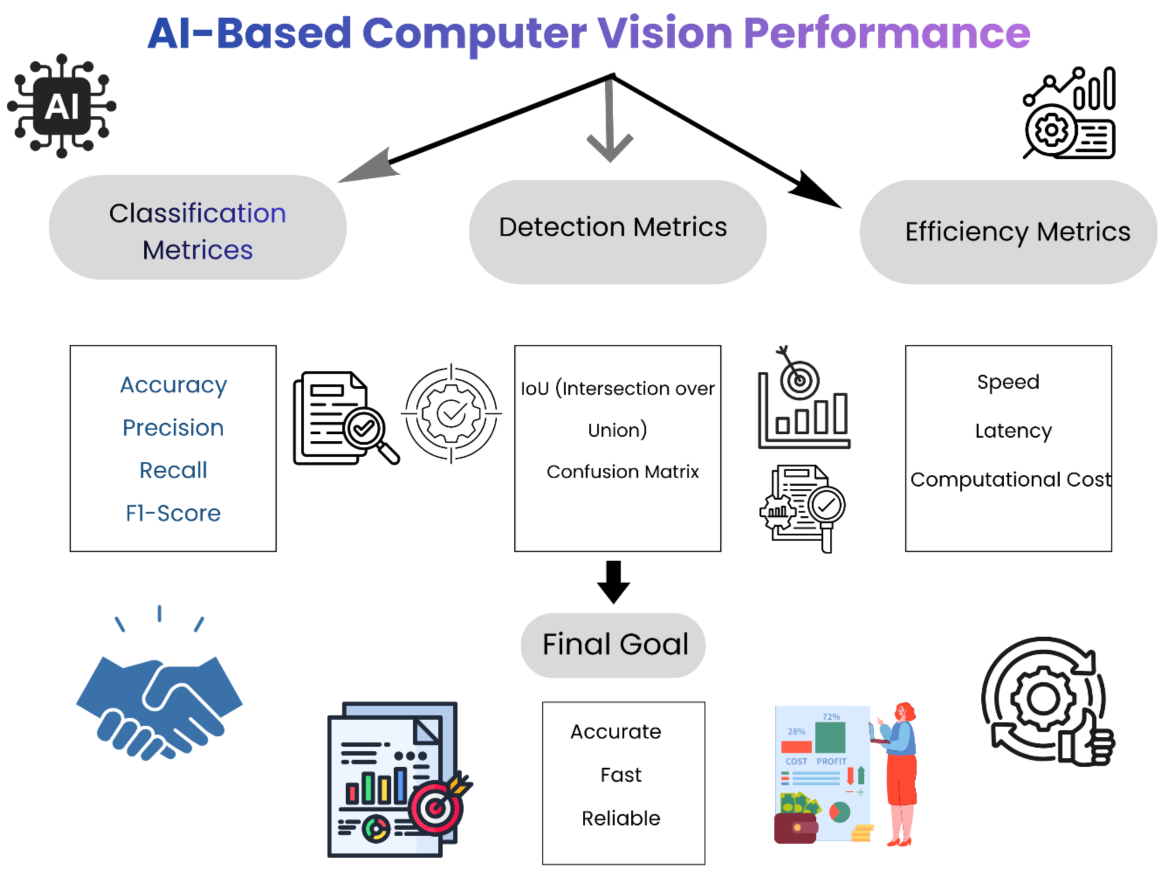

Figure 3. AI based computer vision performance

Along with model accuracy, Computer Vision also has efficiency metrics. These metrics are speed, latency and the amount of computational resources used, and are important in Computer Vision applications like self-driving vehicles and CCTV. The model could be accurate but inefficient. There are metrics to help understand, compare and optimize AI based Computer Vision systems. These ensure the system is accurate, fast, stable and applicable for high performance systems [36].

CHALLENGES AND LIMITATIONS

The pace of improvement and success of using Artificial Intelligence in Computer Vision has been quick, however there are a few limitations and challenges which affect its performance, accuracy and application. Such challenges and limitations are around technical and practical issues of data, computing and ethics. Large and quality data is important [37]. Machine learning models (such as deep learning models) which are widely used in Computer Vision, require large data for training. Data gathering and labelling can be time-consuming, expensive and tedious (for medical images). In certain situations, the data may not be of high quality, leading to poor generalizability [38].

Another challenge is computational power. Computer Vision algorithms, particularly deep neural

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

networks are computationally expensive. They can require specialised equipment (e.g. GPUs) to train which is expensive. They might be slow to run and so unsuitable for real-time applications such as driving and security [39]. There can be problems of over-fitting and generalisation. The model performs well on the training data, but does not work (generalise) on the real data. This is because it has learnt spurious features. Data augmentation and regularisation can help, but can be difficult. Variability is also an issue. Computer Vision can be affected by lighting, occlusions, background and poses. A computer vision system that works to detect objects in a lab may not work so effectively outside in changing lighting conditions and with varying object appearances [40].

Privacy and ethics concerns. Facial recognition and other methods have issues with surveillance, privacy and use. Issues with data collection and storage need to be addressed to ensure legal and ethical procedures are adhered to. There are also problems with model interpretability. Deep learning algorithms can be thought of as "black boxes" - we don't know why this decision is made. This is a problem in critical applications such as health where it is essential to have some understanding of the prediction [41]. There are a lot of developments in the field of Computer Vision and Artificial Intelligence but there are some constraints on the data used, computer resources, environmental, ethical and black box problems. These limitations need to be addressed to improve the efficiency, effectiveness and reliability of systems in the future [42].

RECENT ADVANCES AND TRENDS

The rapid advances in the realm of Artificial Intelligence for Computer Vision have resulted in increased speed, efficiency and effectiveness. Over the last couple of years, we have moved from convolutional-based models to more efficient, scalable and flexible models which improve the outcomes of different computer vision tasks such as object detection, image segmentation, video recognition and multimodal learning [43]. Vision Transformers (ViTs) are the latest development. Rather than using local filters like the traditional convolutional neural networks (CNNs) to produce a feature map of an image, Vision Transformers use attention to learn relationships between different parts of an image. This enables more global information to be incorporated and improved performance on recognition tasks. Vision Transformers work well with large data sets and are being applied in sophisticated models, instead of CNNs [44].

The second development is using self-supervised learning (not using large amounts of labels). Self-supervised models are trained to predict the masked region of the image. This is particularly helpful when labels are hard (and costly) to obtain, such as medical images and satellite images. It has allowed scaling of AI models. The second one is foundation models [45]. These are large models which have been trained with large datasets and then fine-tuned for different tasks. Computer Vision foundation

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

models have high transfer learning capacity, where the model can be fine-tuned for a range of tasks like classification, segmentation and detection [46].

The second trend is multimodal learning where computer vision can be integrated with other modalities like text, audio and sensors. This helps to learn better about the world. They can now caption the image, describe the image and use vision and text to describe. There is a focus on real-time and Edge AI. Due to the advances in hardware and quantization, computer vision models can be run on mobile, IoT and drones. This results in quicker execution and improved privacy as data is not outsourced to the cloud [47].

Synthetic data is also being used. Techniques to produce synthetic images are generative adversarial networks (GANs) and diffusion models. This helps with data availability and generalization issues. Recent advances in Computer Vision are advancements in transformers, self-supervised learning, foundation models, multimodal learning, and edge computing and synthetic data. This is now leading to more powerful, efficient and flexible AI [48].

ETHICAL AND PRIVACY CONCERNS

Privacy and ethics in the use of Artificial Intelligence (AI) Computer Vision systems are becoming more important as they are taken up by governments and industry. Computer Vision systems offer numerous benefits including security, automation and efficiency but also raise human rights, privacy and ethical issues. We need to think about these to ensure ethical, fair and socially responsible deployment of AI systems [49]. One of the main concerns is privacy concerns with facial recognition and surveillance. Computer Vision systems can be used to identify people in real time, using cameras in public spaces, at work and even in the home. This can be used for security and law enforcement but can also lead to "constant surveillance". The subjects may not be aware they are being monitored, and there are questions around consent [50].

Data collection and use is an issue. AI vision systems need to store a lot of data. This may include images of people, locations and items that may be private. If this data is not secure it can be hacked, stolen and misused. This may result in identity theft, privacy and data concerns. Computer Vision also presents issues with bias. Machine Learning algorithms can learn biases from training data, and can make incorrect predictions for some individuals [51]. For example, facial recognition systems have been shown to be less accurate for dark skinned individuals or some facial structures. This may result in discrimination and unfairness, especially in critical applications such as law enforcement and recruitment [52].

Ethical issues are also raised by explain ability. Deep-learning models are black boxes - you can't see how they work. This means it might be difficult to understand how a system has come to a decision,

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

which could be a problem for some medical or policing applications. There are fears that AI will be used maliciously, for example, generating deep fakes and spyware. AI-based computer vision systems can create images and videos, which can be used to deceive and manipulate others [53]. The aim is to minimize the risks through ethical and regulatory guidelines for AI. These include anonymisation, consent, and fairness and explain ability. Computer vision is a good thing, but can be unethical. We should address these challenges to ensure ethical deployment of AI-based systems, protect human rights and build trust in AI [54].

FUTURE OF AI COMPUTER VISION

Computer Vision based on AI will have a future with more accurate, efficient, adaptable and useful Computer Vision systems. Computer Vision systems are becoming smarter, efficient and with human-like intelligence. There are some recent breakthroughs in the design of AI systems using Computer Vision. One of the future directions is general models. At present Computer Vision models are trained for a particular task such as object detection and classification. But in the future they will be more general models. This is tied to the creation of task-adapted foundation models [55].

The second one is unsupervised and self-supervised learning. Given the expense of labelling data, we will likely see more Computer Vision systems in the future that use learning techniques that can be applied to unlabelled data (or semi-supervised learning). This will allow models to learn to be faster and learn to adapt to a new environment [56]. Multimodal AI systems will also play an important role. Computer Vision models in the future will not only understand images and video, but will understand images and video together with text, audio and other sensor data. This will lead to a better comprehension of the world. For example, an AI system will not only comprehend a scene, but also describe the scene using text and answer questions about the scene [57].

There will also be an increase in the use of Computer Vision on devices due to the increase in real-time and edge computing. With the improvement of computing power and speed, Computer Vision will be run on mobile phones, drones, sensors and so on. This will reduce the latency, enhance privacy and improve the real-time decision making in applications such as robots and self-driving cars. Another very exciting research direction is to develop explainable and safe AI models [58]. Computer Vision models will be explainable and users will be able to interpret them. This will be essential for safe use in other safety-critical domains such as health, finance and law. More use of data and training for Computer Vision. These techniques allow for training in the virtual world without big data and improve safety in training for applications such as self-driving cars [59]. Computer Vision will be more intelligent, efficient and inclusive when powered by AI. And new learning methods, multimodal technologies, edge computing and explainable Computer Vision will increase the importance of this

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

technology for industry and human-machine interaction [60].

CONCLUSION

Artificial Intelligence-powered Computer Vision is a recent disruptive technology that helps computers. Computer Vision has progressed from low-level processing to transformers. This enables computers to perform complex visual tasks, such as object classification and detection, face recognition and scene understanding, accurately and quickly. Computer Vision and AI have provided new opportunities in several fields. In medicine, it's used for detection of disease. In vehicles, it's essential for autonomous vehicles for object detection and tracking. In security, it's used to monitor and identify, and in business and farming, it's used to automate, analyses and make decisions. These are only a few of the possible applications of Computer Vision technology.

These tools work with advanced technologies like machine learning, deep learning, and convolutional neural networks (CNN) and transfer learning. These allow models to be trained on multiple data sets and for them to be retrained. These technologies are complemented with evaluation metrics like accuracy, precision, recall, F1-score, IoU and mAP to measure model performance and usage. But there are challenges. These include the need for large data sets, computational resources, generalizability, explain ability and ethical issues related to privacy and bias. These factors must be considered to ensure safe and effective systems.

Emerging techniques, such as Vision Transformers, self-supervised learning, foundation models, multimodal AI and edge computing are providing new opportunities in Computer Vision. These approaches are enhancing the efficiency, speed and adaptability of systems, while reducing the resource requirements in terms of data and computation. AI in Computer Vision is a fascinating research field that will revolutionize computer vision. Its growing potential and ongoing research and development will ensure its future as a valuable technology as it will be a safe, efficient and intelligent system for many applications.

REFERENCES

[1]. Singh G, Pidadi P, Malwad DS. A review on applications of computer vision. InInternational conference on Hybrid Intelligent Systems 2022 Dec 13 (pp. 464-479). Cham: Springer Nature Switzerland.

[2]. Naskath J, Sivakamasundari G, Begum AA. A study on different deep learning algorithms used in deep neural nets: MLP SOM and DBN. Wireless personal communications. 2022 Oct 19;128(4):2913.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[3]. El Qasemy H. Cognitive Technologies: Machine Learning, Artificial Intelligence, and Convolutional Neural Networks in Computer Vision. WESTCLIFF INTERNATIONAL JOURNAL OF APPLIED RESEARCH Учредители: Westcliff University. 2025;9(1):5-17.

[4]. Sun L, Shang Z, Xia Y, Bhowmick S, Nagarajaiah S. Review of bridge structural health monitoring aided by big data and artificial intelligence: From condition assessment to damage detection. Journal of Structural Engineering. 2020 May 1;146(5):04020073.

[5]. Muehlematter UJ, Daniore P, Vokinger KN. Approval of artificial intelligence and machine learning-based medical devices in the USA and Europe (2015–20): a comparative analysis. The Lancet Digital Health. 2021 Mar 1;3(3):e195-203.

[6]. De Alwis S, Hou Z, Zhang Y, Na MH, Ofoghi B, Sajjanhar A. A survey on smart farming data, applications and techniques. Computers in Industry. 2022 Jun 1;138:103624.

[7]. Mohsan SA, Khan MA, Noor F, Ullah I, Alsharif MH. Towards the unmanned aerial vehicles (UAVs): A comprehensive review. Drones. 2022 Jun 15;6(6):147.

[8]. Mozaffari S, Al-Jarrah OY, Dianati M, Jennings P, Mouzakitis A. Deep learning-based vehicle behavior prediction for autonomous driving applications: A review. IEEE Transactions on Intelligent Transportation Systems. 2020 Aug 4;23(1):33-47.

[9]. Fauzi A, Rahayu S, Sutrisno B. A Comprehensive Review of Deep Learning Architectures and Their Applications in Computer Vision. Artificial Intelligence and Machine Learning Review. 2024 Jan 4;5(1):1-7.

[10]. Wu P, He X, Dai W, Zhou J, Shang Y, Fan Y, Hu T. A Review on Research and Application of Al-based Image Analysis in the field of Computer Vision. IEEE Access. 2025 Apr 29.

[11]. Khan AA, Laghari AA, Awan SA. Machine learning in computer vision: A review. EAI Endorsed Transactions on Scalable Information Systems. 2021 Oct 1;8(32).

[12]. Alshammari RF, Arshad H, Abd Rahman AH, Albahri OS. Robotics utilization in automatic vision-based assessment systems from artificial intelligence perspective: A systematic review. IEEE access. 2022 Jul 4;10:77537-70.

[13]. Gong Z. Evaluation of the Application of Artificial Intelligence Technology in Computers. In2023 2nd International Conference on Data Analytics, Computing and Artificial Intelligence (ICDACAI) 2023 Oct 17 (pp. 114-118). IEEE.

[14]. Yutia SN, Tyas SH, Haryadi D. Trends in Research and Artificial Intelligence Methods for Steganalysis-A Systematic Literature Review (SLR). In2024 International Conference on ICT for Smart Society (ICISS) 2024 Sep 4 (pp. 1-6). IEEE.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[15]. Nain V, Shyam HS, Kumar N, Tripathi P, Rai M. A study on object detection using artificial intelligence and image processing–based methods. Mathematical models using artificial intelligence for surveillance systems. 2024 Aug 27:121-48.

[16]. Kuhar N, Kumria P, Rani S. Overview of applications of artificial intelligence (AI) in diverse fields. InApplication of artificial intelligence in wastewater treatment 2024 Sep 10 (pp. 41-83). Cham: Springer Nature Switzerland.

[17]. Vukicevic AM, Petrovic M, Milosevic P, Peulic A, Jovanovic K, Novakovic A. A systematic review of computer vision-based personal protective equipment compliance in industry practice: advancements, challenges and future directions. Artificial Intelligence Review. 2024 Oct 10;57(12):319.

[18]. Li H, Zhang N. Computer vision models for image analysis in advertising research. Journal of Advertising. 2024 Oct 19;53(5):771-90.

[19]. Wei Z, Jiang Y, Liu H. Optical imaging combined with artificial intelligence in plant disease detection: a comprehensive review. Spectroscopy Letters. 2025 Aug 9;58(7):679-703.

[20]. Shafik W, Hidayatullah AF, Kalinaki K, Aslam MM. Artificial intelligence (AI)-assisted computer vision (CV) in healthcare systems. InComputer vision and AI-integrated IoT technologies in the medical ecosystem 2024 Mar 29 (pp. 17-36). CRC Press.

[21]. Zeng J, Fu Q. A review: artificial intelligence in image-guided spinal surgery. Expert Review of Medical Devices. 2024 Aug 2;21(8):689-700.

[22]. Esengoenuel M, Marta A, Beirao J, Pires IM, Cunha A. A systematic review of artificial intelligence applications used for inherited retinal disease management. Medicina. 2022 Mar 31;58(4):504.

[23]. Alshiha AA. A Review of the Integration Between Geospatial Artificial Intelligence and Remote Sensing. Iraqi Journal for Computer Science and Mathematics. 2024;5(3):19.

[24]. Ghosh I, Ramasamy Ramamurthy S, Chakma A, Roy N. Sports analytics review: Artificial intelligence applications, emerging technologies, and algorithmic perspective. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery. 2023 Sep;13(5):e1496.

[25]. Kalganov N, Sabdenaliyev B, Igenbayev A, Kozhanov M, Mosavi A, Mako C, Kazizat I, Shakhatova A. Machine Learning in Employment Research Considering Methods and Applications in Job Quality and Algorithmic Management. In2025 IEEE 25th International Symposium on Computational Intelligence and Informatics (CINTI) 2025 Nov 18 (pp. 000607-000614). IEEE.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[26]. Agrawal K, Kumar N. Computer Vision in Agriculture: Object Detection, Recognition, and Image Segmentation Techniques and Advanced Image Analysis. Computational Intelligence and Image Processing in Agriculture: Applications and Innovations. 2025 Nov 18:31-54.

[27]. Widhawati R, Purnama S, Putro HP, Gantari L, Rahagi S. Computational support in academic peer review: An artificial intelligence perspective. ADI Journal on Recent Innovation. 2024 Sep 30;6(1):74-80.

[28]. Zhong S, Zhang K, Bagheri M, Burken JG, Gu A, Li B, Ma X, Marrone BL, Ren ZJ, Schrier J, Shi W. Machine learning: new ideas and tools in environmental science and engineering. Environmental science & technology. 2021 Aug 17;55(19):12741-54.

[29]. Saliu N, Elezi K. Integration of artificial intelligence in floorplan layout planning: a systematic review of models, methods, and applications. European Chronicle. 2025 Mar 4;10(1):57-65.

[30]. Bhulakshmi D, Rajput DS. A systematic review on diabetic retinopathy detection and classification based on deep learning techniques using fundus images. PeerJ Computer Science. 2024 Apr 29;10:e1947.

[31]. Elbasi E, Mostafa N, AlArnaout Z, Zreikat AI, Cina E, Varghese G, Shdefat A, Topcu AE, Abdelbaki W, Mathew S, Zaki C. Artificial intelligence technology in the agricultural sector: A systematic literature review. IEEE access. 2022 Dec 26;11:171-202.

[32]. Mennella C, Maniscalco U, De Pietro G, Esposito M. The role of artificial intelligence in future rehabilitation services: a systematic literature review. IEEE Access. 2023 Jan 11;11:11024-43.

[33]. Gondaliya[1] SH. A Review: Artificial Intelligence in Restaurant. InProceedings of the International Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022) 2023 May 1 (Vol. 105, p. 397). Springer Nature.

[34]. Malik K, Robertson C, Roberts SA, Remmel TK, Long JA. Computer vision models for comparing spatial patterns: understanding spatial scale. International Journal of Geographical Information Science. 2023 Jan 2;37(1):1-35.

[35]. Frazier AE, Song L. Artificial intelligence in landscape ecology: recent advances, perspectives, and opportunities. Current Landscape Ecology Reports. 2024 Nov 15;10(1):1.

[36]. Memon AR, Li J, Egger J, Chen X. A review on patient-specific facial and cranial implant design using Artificial Intelligence (AI) techniques. Expert review of medical devices. 2021 Oct 3;18(10):985-94.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[37]. Sun Q, Zhang M, Mujumdar AS. Recent developments of artificial intelligence in drying of fresh food: A review. Critical reviews in food science and nutrition. 2019 Aug 6;59(14):2258-75.

[38]. Aderibigbe AO, Ohenhen PE, Nwaobia NK, Gidiagba JO, Ani EC. Artificial intelligence in developing countries: Bridging the gap between potential and implementation. Computer Science & IT Research Journal. 2023 Dec;4(3):185-99.

[39]. Almoselhy RI, Usmani A. AI in food science: Exploring core elements, challenges, and future directions. Challenges, and Future Directions (December 12, 2024). 2024 Dec 12.

[40]. Battina DS. Artificial intelligence in software test automation: A systematic literature review. International Journal of Emerging Technologies and Innovative Research (www. jetir. org| UGC and issn Approved), ISSN. 2019 Dec 12:2349-5162.

[41]. Dixit H, Kanagaraj R, Krishnaraj N. Implementation of Artificial Intelligence based Skin Disease Detection using Computer vision Technique. In2025 9th International Conference on Electronics, Communication and Aerospace Technology (ICECA) 2025 Nov 5 (pp. 924-929). IEEE.

[42]. Mavani NR, Ali JM, Othman S, Hussain MA, Hashim H, Rahman NA. Application of artificial intelligence in food industry—a guideline. Food Engineering Reviews. 2022 Mar;14(1):134-75.

[43]. Salerno S, Li Y. High-dimensional survival analysis: Methods and applications. Annual review of statistics and its application. 2023 Mar 9;10(1):25-49.

[44]. FraiJ J, László V. A literature review: artificial intelligence impact on the recruitment process. International Journal of Engineering and Management Sciences. 2021 May 13;6(1):108-19.

[45]. Ikubanni PP, Ejalonibu D, Abioye OM, Alhassan EA, Faloye OT, Adeleke AA. Recent Advances of Artificial Intelligence in the Agricultural Sector: A Review. NIPES JSTR SPECIAL ISSUE. 2025 Oct 22;7(1):219-26.

[46]. Saminu S, Xu G, Zhang S, Ab El Kader I, Aliyu HA, Jabire AH, Ahmed YK, Adamu MJ. Applications of artificial intelligence in automatic detection of epileptic seizures using EEG signals: A review. InArtificial intelligence and applications 2023 (Vol. 1, No. 1, pp. 11-25).

[47]. Li Y, Yu D, Liu Z, Zhang M, Gong X, Zhao L. Graph neural network for spatiotemporal data: methods and applications. arXiv preprint arXiv:2306.00012. 2023 May 30.

[48]. Fatoki O, Du C, Hans R, Bello RW. Role of computer vision and deep learning algorithms in livestock behavioural recognition: A state-of-the-art-review. Available at SSRN 5029111. 2024 Nov 10.

ISSN : 3067-8293
Volume 2, Number 1, 2026
https://doi.org/10.70445/ajac.2.1.2026.92-108

[49]. Miller R, Farnebo S, Horwitz MD. Insights and trends review: artificial intelligence in hand surgery. Journal of Hand Surgery (European Volume). 2023 May;48(5):396-403.

[50]. Sessa M, Shakibfar S, Andersen M, Zhao J. Artificial intelligence and machine learning in drug utilization research. Drug Utilization Research: Methods and Applications. 2024 Sep 9:205-14.

[51]. Dinesh A, Kamal B, Akash M, Surthik KR. Implementation of artificial intelligence to the prediction of the mechanical properties of concrete: A review. Materials Today: Proceedings. 2023 May 15.

[52]. Zhao M, Li J, Li S, Liu J, Jiang Y, Lai X, Yang J, Pang L, Tang L, Li K, Jiang L. Artificial intelligence assisted simulation and surgical video analytics for ophthalmic surgery training and competence development. Frontiers in Medicine. 2026 Mar 19; 13:1781818.

[53]. Craveiro M, Domingues L. Artificial Intelligence on Project Management Performance Domains. Procedia Computer Science. 2025 Jan 1; 256:1583-90.

[54]. MacLeod JS, Compton T, Bakaes Y, Chopra A, Akwuole F, Christenson C, Hsu W. Artificial intelligence in spine surgery: imaging-based applications for diagnosis and surgical techniques. Current Reviews in Musculoskeletal Medicine. 2025 Oct; 18(10):398-405.

[55]. Yang R, Yuan Q, Zhang W, Cai H, Wu Y. Application of Artificial Intelligence in rehabilitation science: A scientometric investigation Utilizing Citespace. SLAS technology. 2024 Aug 1; 29(4):100162.

[56]. Hadid MH, Hussein QM, Al-Qaysi ZT, Ahmed MA, Salih MM. An Overview of Content-BasedImage Retrieval Methods and Techniques. Iraqi Journal for Computer Science and Mathematics. 2023;4(3):6.

[57]. Bezas K, Filippidou F. The role of artificial intelligence and machine learning in smart and precision agriculture. The Indonesian Journal of Computer Science. 2023 Aug 30; 12(4).

[58]. Zabala-Vargas S, Jaimes-Quintanilla M, Jimenez-Barrera MH. Big data, data science, and artificial intelligence for project management in the architecture, engineering, and construction industry: a systematic review. Buildings. 2023 Nov 25; 13(12):2944.

[59]. Kayser K, Telukdarie A. Literature review: Artificial intelligence adoption within the accounting profession applying the technology acceptance model (3). InICABR Conference 2023 Jun 29 (pp. 217-231). Cham: Springer Nature Switzerland.

[60]. Rahil I, Bouarifi W, Oujaoura M. A Review of Computer Vision Techniques for Video Violence Detection and intelligent video surveillance systems. International Journal. 2022 Mar; 11