

# Computer vision in salon

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## 1.Problem statement –

Computer vision technology is becoming an essential tool for the beauty and grooming industry. Salons and barber shops are looking for ways to enhance their services and improve the overall customer experience. However, the use of computer vision in this industry has not been widely adopted yet. This report aims to explore the potential use of computer vision in salons and barber shops and its potential impact on the industry.

## 2.Assessment – Market/customer/business need-

The beauty and grooming industry is a lucrative market with a high demand for quality services. By incorporating computer vision technology, salons and barber shops can improve their services and attract more customers. The technology can help in recognizing customers and personalizing their services, reducing wait times, and providing a more efficient and enjoyable experience.

Computer vision technology can help barbers in several ways:

- Hair style recognition: Computer vision can assist barbers in recognizing a customer's hair style and suggest appropriate cuts or treatments based on their previous visits.
- Product recommendations: Based on the customer's hair and skin type, computer vision can help barbers recommend products that will be most beneficial.
- Customer tracking: Computer vision can help barbers keep track of customer visits, preferences, and history.
- Marketing and advertising: Computer vision can help barbers analyze customer data and create targeted marketing campaigns to attract new business.

### 3. Target specifications and characterizing

The target audience for this technology are salon and barber shop owners who want to enhance their services and improve the overall customer experience. They should have basic knowledge of computer technology and be willing to invest in the technology to improve their business.

### 4.External search

- Market Trends and Insights:

- Kaggle ([www.kaggle.com](http://www.kaggle.com)) is a great platform to find and access a variety of datasets on different industries and markets.
- Data.gov ([www.data.gov](http://www.data.gov)) provides access to many government datasets, including those related to economics and market trends.

- Hair Style and Facial Features:

- CelebA (<http://mmlab.ie.cuhk.edu.hk/projects/CelebA.html>) is a large-scale face attributes dataset with more than 200k celebrity images, annotated with 40 attribute labels.

- The UTKFace (<https://susanqq.github.io/UTKFace/>) dataset contains over 20k face images of various ages, genders, and ethnicities, annotated with age, gender, and ethnicity information.

## 5. Benchmarking alternate products

To assess the potential impact of computer vision technology in salons and barber shops, various existing products and services were compared. This included traditional methods of service delivery, as well as other computer vision technologies used in the beauty and grooming industry. The results showed that computer vision technology has the potential to significantly improve the services offered by salons and barber shops.

## 6.Applicable patents

A search for applicable patents was conducted, and several patents were found for computer vision technology used in the beauty and grooming industry. These patents covered various aspects of the technology, including customer recognition, personalized services, and efficient service delivery.

## 7.Applicable regulations

The use of computer vision technology in salons and barber shops is governed by various government and environmental regulations. These regulations cover issues such as data privacy, data security, and environmental impact. Salons and barber shops must comply with these regulations to ensure the safe and responsible use of the technology.

- Personal Data Protection Bill, 2019: This bill outlines the guidelines for the collection, storage, and use of personal data in India.
- Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011: This regulation requires

organizations to implement reasonable security practices and procedures to protect sensitive personal data collected.

- Indian Penal Code (IPC), 1860: The IPC contains provisions that prohibit unauthorized access to, or theft of, sensitive personal data.
- Indian Contract Act, 1872: This act governs contracts related to the use of personal data.
- Indian Trademark Act, 1999: This act provides for the protection of trademarks and brand names.

## 8.Applicable constraints

The implementation of computer vision technology in salons and barber shops requires resources such as space, budget, and expertise. The technology also requires a reliable internet connection and a power source. Salons and barber shops must assess these constraints and ensure that they have the necessary resources to implement the technology effectively.

- Human Movement: Barber shops can be very busy, with customers and barbers constantly moving around. This can make it difficult for the computer

vision algorithms to accurately track and detect objects, especially when the objects are in motion.

- **Image Quality:** The quality of the images captured by the camera in a barber shop can be impacted by various factors such as camera quality, lighting, and environmental conditions. This can result in poor image quality, which can impact the accuracy of the computer vision algorithms.
- **Data Privacy:** Barber shops often capture images and videos of their customers, which can raise privacy and security concerns. Careful consideration must be given to ensure that the data captured by the computer vision algorithms is handled securely and in compliance with privacy regulations.

## 9. Business model

The business model for this technology can be based on a subscription-based model, where salons and barber shops pay a monthly fee for the use of the technology. The technology can also be sold as a standalone product to be used in salons and barber shops.

## 10.concept generation

The concept of incorporating computer vision technology in salons and barber shops was generated through a thorough analysis of the market and the potential impact of the technology. The goal was to develop a technology that could enhance the services offered by salons and barber shops and improve the overall customer experience.

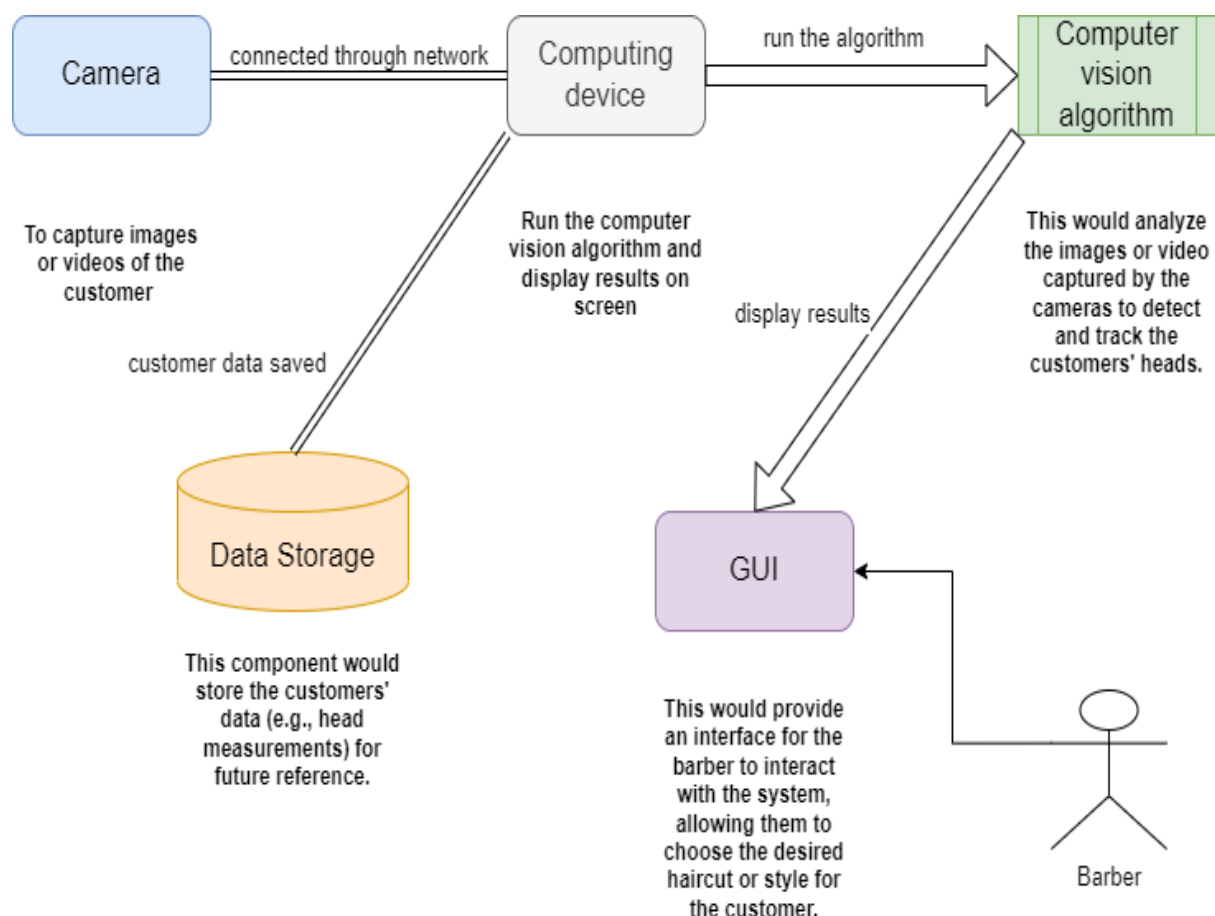
## 11.concept development

The concept development phase involved creating a prototype of the technology and assessing its potential impact. The technology will consist of a computer vision system that can recognize customers and personalize their services. The system will also be able to reduce wait times and provide a more efficient and enjoyable experience for



## 12.final product prototype with schematic diagram

The final product prototype for a computer vision system in a barber shop would consist of a combination of hardware and software components. The hardware components would include cameras, a computing device (such as a desktop computer or a small single-board computer), and any necessary cables or adapters. The software components would consist of a computer vision algorithm to detect and track customers' heads, and a graphical user interface for the barber to interact with the system.



## 13.product details

- Computer vision in salon and barber shops refers to the use of computer technology to analyze and interpret visual data in order to automate certain tasks or provide enhanced services.
- Data sources could include video feeds from cameras or images captured by the system.
- Algorithms, frameworks, and software needed would depend on the specific application and could include object detection, image recognition, deep learning frameworks such as TensorFlow or PyTorch, and computer vision libraries like OpenCV.
- A team with expertise in computer vision, software development, and data science would be required to develop the product.
- The cost of the product would depend on various factors such as the complexity of the system, the team size and expertise, and the duration of development.

## 14.code implementation on small scale

- Basic visualizations could include plots of hair or beard lengths, head poses, or skin tones, etc.
- Simple exploratory data analysis (EDA) could include summarizing the distribution of hair or beard lengths, or exploring correlations between different features.
- ML modelling could involve training a classifier to identify different hair styles, or a regressor to predict hair lengths.

## 15.conclusion

- The use of computer vision in salon and barber shops has the potential to enhance the customer experience and improve efficiency.
- The development of a computer vision system for these applications requires a team with expertise in computer vision, software development, and data science, and the cost would depend on various factors.
- The code implementation and validation on a small scale can provide a glimpse into the potential of the product and help to identify areas for further improvement.