

ITAI 1378 – Summer 2024



LOO ASSIGNMENT

Exploring and analyzing a **real-world application of computer vision** to understand its practical uses, the technology behind it, and its impact.

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ABSTRACT

Bangkok, Thailand, 2017, I was part of a team that piloted an **innovative computer vision program** in a retail loan branch. The application involved using cameras strategically placed within the branch to detect the demographics and mood of incoming customers. This information was then utilized by loan officers to tailor their services and interactions, aiming to enhance customer satisfaction and improve service personalization.

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THEANALYSIS

Abstract

Technology

How It Works

Security and Compliance

Role of Computer Vision

Benefits

Challenges

Reflection

Conclusion

The Technology **Behind It**

HOW IT WORKS

Image Capture:

Cameras installed at the entrance and within the branch captured images and video of the customers as they entered and moved around.

Face Detection and Analysis:

Using computer vision algorithms, the system detected faces in the captured images. Advanced techniques such as Convolutional Neural Networks (CNNs) were employed to ensure accurate detection.

Demographic Analysis:

The system analyzed facial features to estimate the customer's age, gender, and other demographic attributes. This involved using pre-trained models capable of distinguishing different demographic characteristics.

Mood Detection:

The system assessed facial expressions to gauge the customer's mood, identifying emotions such as happiness, frustration, or neutrality. This was achieved through algorithms designed to recognize subtle changes in facial muscle movements.

Cloud-Based Processing:

Majority of the image processing was done using Huawei's cloud AI services. This setup allowed us to focus on image capture infrastructure and integrating responses into our CRM systems. The cloud-based approach ensured scalability and high processing power, essential for real-time analysis.

Data Integration:

The analyzed data was then integrated into the branch's customer management system, providing loan officers with real-time information about the customer's demographic profile and mood.

Service Personalization:

Loan officers used this information to personalize their interactions, offering services that were more likely to resonate with the customer's current emotional state and demographic background.

The Technology **Behind It**

SECURITY & COMPLIANCE

As a financial institution, we had to ensure that the system was highly secure and compliant with relevant regulations.

The use of Huawei's cloud AI offering provided robust security measures, while our internal infrastructure was designed to protect sensitive customer data and ensure privacy.

Role Of **COMPUTER VISION**

Computer vision was central to this application, enabling the system to process and analyze visual data to extract meaningful information. The technology facilitated real-time face detection, demographic analysis, and mood detection, making it possible to provide tailored customer service based on visual cues.

BENEFITS

Enhanced Customer Experience

By personalizing interactions based on real-time data, loan officers could address the specific needs and preferences of each customer, leading to higher satisfaction.

Improved Efficiency

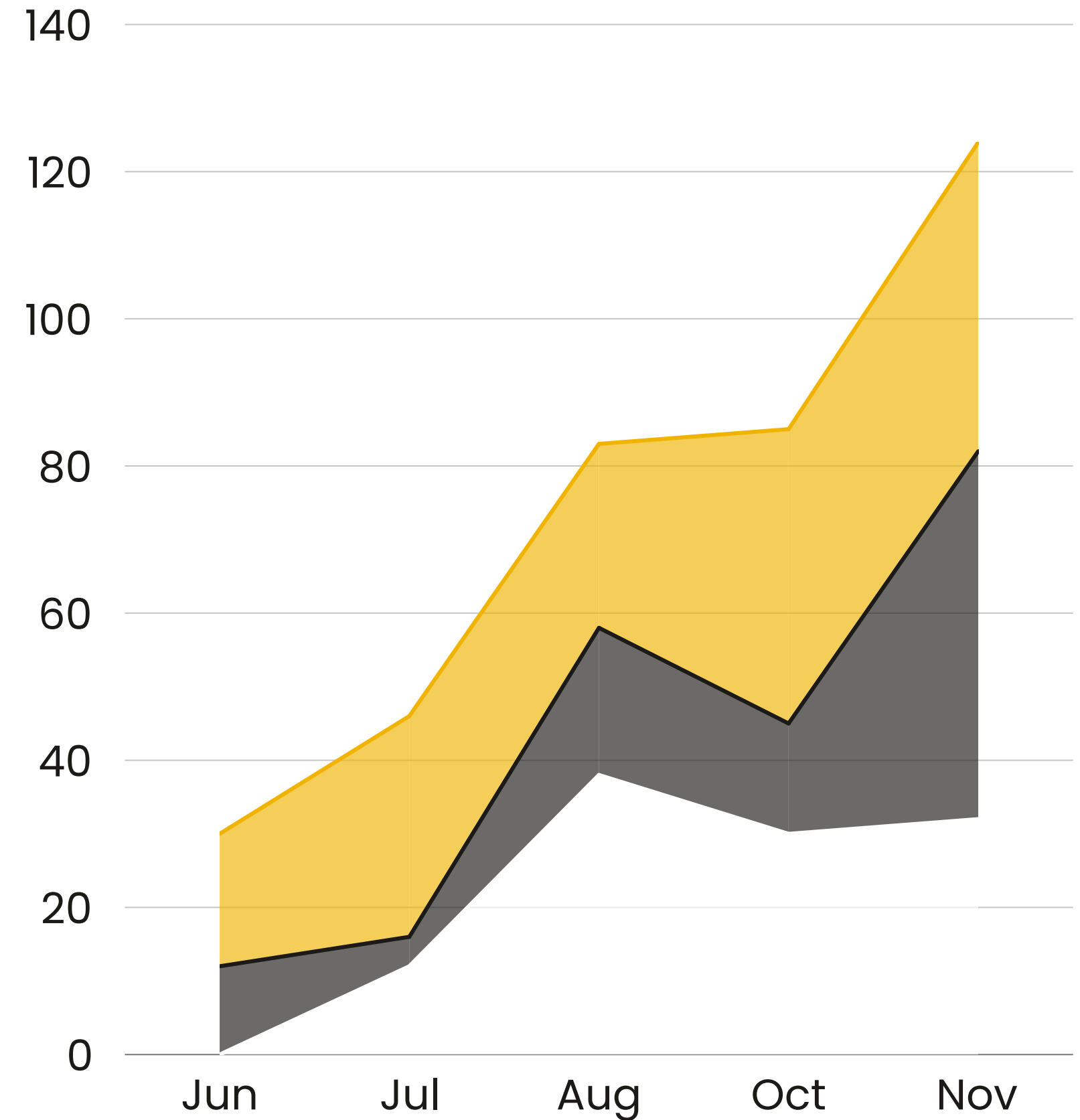
The system allowed for quicker identification of customer needs, enabling loan officers to serve clients more efficiently and effectively.

Data-Driven Insights

The collected data provided valuable insights into customer behavior and preferences, informing future service improvements and marketing strategies.

Competitive Advantage

Implementing such advanced technology differentiated the loan branch from competitors, showcasing a commitment to innovation and customer-centricity.



CHALLENGES

PRIVACY CONCERNS

The use of cameras to capture and analyze customer data raised significant privacy issues, requiring robust measures to ensure data protection and customer consent.

The ethical implications of monitoring and analyzing customers without their explicit knowledge or consent posed significant concerns.

ACCURACY & BIAS

Ensuring the accuracy of demographic and mood detection across diverse populations was challenging. Potential biases in the algorithms could lead to misidentifications and unequal service.

The system required high-quality images and optimal lighting conditions to function effectively, which might not always be feasible in a real-world environment.

REFLECTION

The future of **computer vision** in retail banking and similar sectors holds exciting potential. Developments in AI and machine learning could enhance the accuracy and fairness of demographic and mood detection systems. However, it is crucial to address privacy, ethical, and technical challenges to ensure the technology's responsible use.

This technology could significantly affect society by enhancing personalized customer service and operational efficiency. Nevertheless, it is vital to balance the benefits with the ethical and privacy considerations to ensure trust and acceptance from customers.

CON CLUSION

The pilot program in the retail loan branch demonstrated the practical application of **computer vision** to enhance customer service. By detecting customer demographics and mood, the system enabled personalized interactions, leading to improved customer satisfaction. The analysis of this technology highlights its potential benefits and challenges, emphasizing the need for careful consideration of ethical and privacy issues.



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THANK YOU
SO MUCH!

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Assignment

L00 – Exploring Real-World Applications of Computer Vision

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