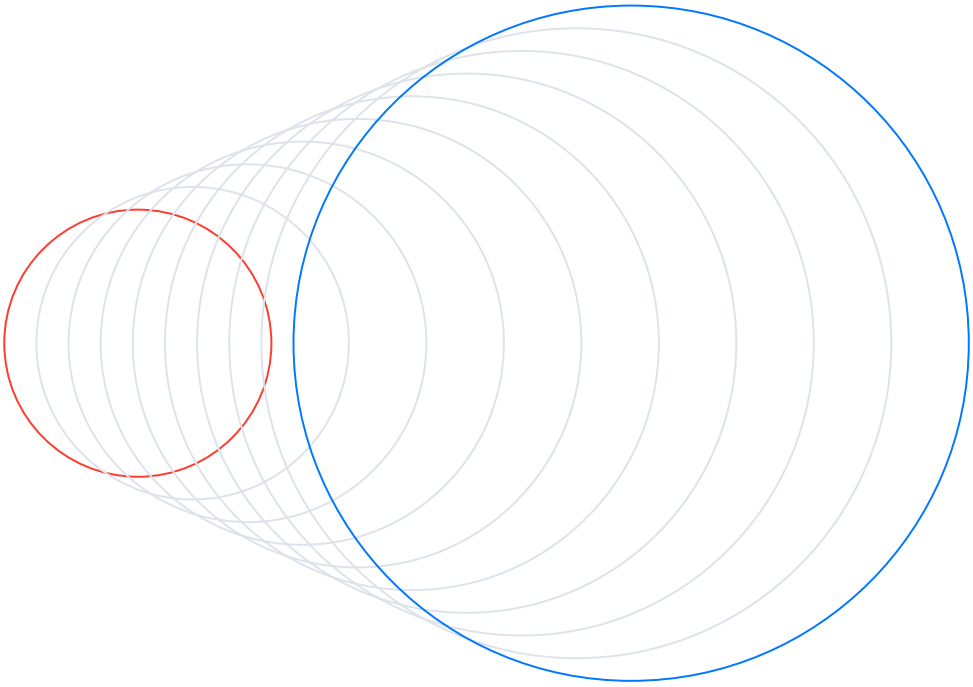
paravision

COVID-19: Enhanced Safety & Security

Powered by Paravision's Computer Vision Toolset



Introduction

The COVID-19 pandemic has fundamentally shifted today's business environment, with changing policies, social norms, and expectations. The current situation demands novel solutions that can enhance safety, security, efficiency, and customer experience despite challenging economic conditions, and help push life towards a new normal.

Capitalizing on dramatic advancements in accuracy and robustness, Paravision is focused on bringing its artificial intelligence (AI) and machine learning (ML)-powered computer vision (CV) toolset to development partners as a response to current events.

Understanding The New Normal

With the development of a vaccine likely more than a year away[1], people and organizations are anticipating a "new normal," with extended periods of restricted living and fundamentally different consumer interactions.

Some trends that will define this new normal include:

Policy changes

Lawmakers will likely extend physical distancing guidelines and place restrictions on large gatherings and unnecessary travel. Several local governments have already made the use of masks in public places compulsory. Innovative solutions will be needed to assist with compliance efforts.

At an organizational level, policies will be needed to ensure the speedy and safe return of the workforce, especially in industries that cannot fully support a remote working environment such as healthcare, logistics, defense, utilities, and travel.

Changing Social Norms

Common social behaviors are no longer acceptable during COVID-19 times. People are embracing social distancing and adopting new ways of meeting with colleagues and friends. Regardless of policy-based restrictions, individuals themselves will shy away from traveling. The new normal may also see an increased focus on hygiene, with people preferring contactless experiences rather than the physical exchange of items or touching of surfaces.

Consumer and Employee Expectations

Global media coverage has increased public awareness around the diagnosis, control, and spread of COVID-19. Consumers will expect frictionless shopping experiences, safer checkout processes, and cleanliness in retail environments.

People returning to work will have a renewed cautiousness about health and hygiene, and are likely to demand the implementation of physical distancing, personal protective equipment, and general hygiene. Organizations will have to put monitoring systems in place to ensure compliance with new regulations while making employees feel safe.

[1]Kuznia, Robert. 2020. "The Timetable for a Coronavirus Vaccine Is 18 Months. Experts Say That's Risky." CNN, March 31, 2020. https://www.cnn.com/2020/03/31/us/coronavirus-vaccine-timetable-concerns-experts-invs/index.html.

Developing Safety & Security with Paravision

As a provider of mission-critical computer vision capabilities at the intersection of identity, security, and safety, Paravision will strive to deliver a robust and useful toolset that enables its partners to develop best-of-breed AI-powered solutions to assist in the fight against COVID-19.

This toolset will comprise Paravision's standardized (albeit high performance) face recognition, object detection, tracking, and activity recognition combined with newly-developed, purpose-built tools that address the unique challenges presented by COVID-19.

High Performance Face Recognition With Covered Faces

With a significant increase in demand for and use of face masks[2], organizations should anticipate covered faces becoming the norm in workplaces and public settings. While this is a challenge to most face recognition systems, Paravision's algorithms have shown best-of-breed performance in sub-optimal situations where large portions of the face are blocked from view.

As demonstrated in Figure 1, Paravision's algorithms can deliver outstanding accuracy even when the nose and mouth are substantially covered.

Figure 1 *- Paravision's combined face mask detection & face recognition. The subject (Tiffany) was correctly matched against a 15,000 person database with no false positive identifications, with and without a mask, and at direct and extreme angles.*

[2]*"Nielsen Investigation: 'Pandemic Pantries' Pressure Supply Chain Amid COVID-19 Fears." 2020. Nielsen. March 2, 2020. https://www.nielsen.com/us/en/insights/article/2020/nielsen-investigation-pandemic-pantries-pressure-supply-chain-amidst-covid-19-fears/.*

The accuracy of Paravision's face recognition has been independently verified by the National Institute of Standards and Technology (NIST) through their Face Recognition Vendor Test (FRVT) program. In NIST's latest 1:N Identification report, Paravision was ranked #1 in the US, UK, and Europe and atop-3 global vendor in many key measures of accuracy, and #1 globally in profile (90-degree side view) matching, underpinning its unique performance in challenging conditions.

Detection of Masks and Other Personal Protective Equipment (PPE)

Based on the rapidly evolving market need, Paravision has developed new machine learning models to detect the use of face masks. This capability is suited to both close-range detection (as shown in Figure 1) and detection in a crowd. As seen in Figure 2, face masks of various colors are accurately detected despite variations in pose, distance, and focus. This has utility in both cooperative environments, such as access control and air travel, and unconstrained environments (like video security).

Unlike Paravision face recognition, this is a new capability in its primary stages of development. While benchmarks like NIST FRVT don't yet exist for mask detection, Paravision has performed preliminary internal testing on a dataset of 2,000 people, resulting in an initial 99.5% accuracy rate. Both raw performance and the sophistication of internal and external benchmarking are expected to dramatically increase in the near future.

Figure 2 *- Paravision's object detection algorithm detecting face masks in a crowd. Red = No mask; Green = Mask*

Determination of Social Distancing & Associated Activities

Paravision's object detection, tracking, and activity recognition capabilities can also be used to determine whether people adhere to behavioral safeguards such as maintaining safe social distances, and targeted activity recognition tools could readily be developed to (e.g.) track the occurrence of hygiene-related activities such as the regular washing of hands and sanitization of surfaces.

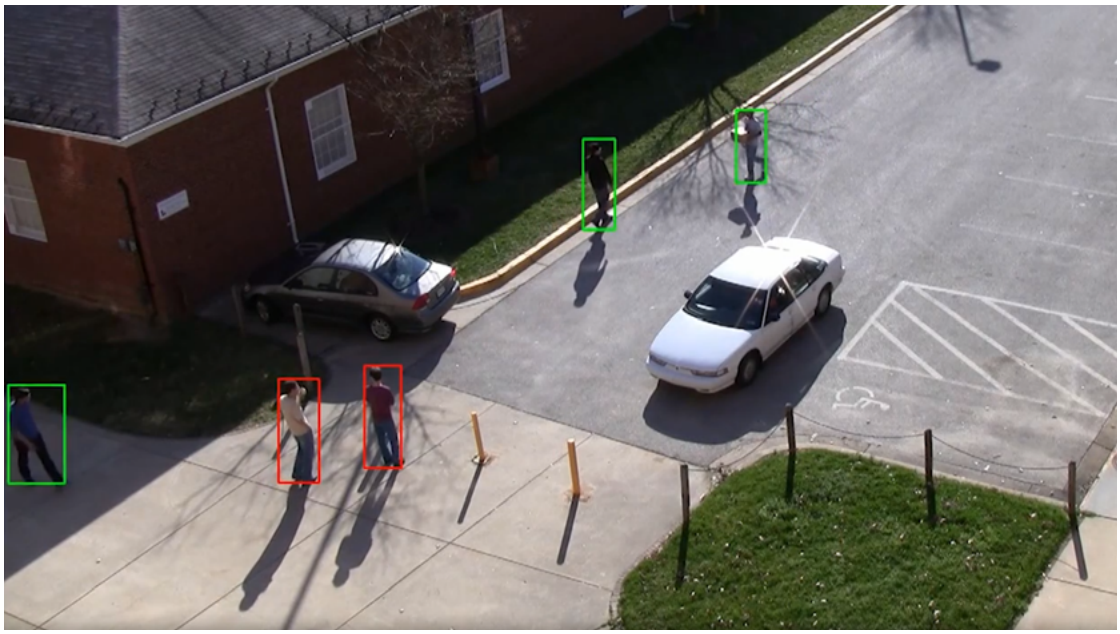


Figure 3 *- Paravision's person detection model with social distancing policies defining acceptable distance between individuals. People in green are maintaining acceptable social distance (≥6 feet), while those in red are not.*

Where Paravision's Computer Vision Solutions Can Help

In the Workplace

Organizations can use computer vision to ensure that individuals adhere to appropriate safety policies and guidelines. As opposed to a manual approach, automated systems can track consumer/worker behavior and provide useful analytics or raise alerts that trigger a secondary response, thus providing benefits in cost, efficiency, and accuracy.

Paravision's toolset can help with:

1 Touchless, Secure Access Control

a. Enable touchless check-in and continuous authentication at work locations without the need to remove masks or other protective devices.

b. Provide fast, touchless, at-a-distance solutions for visitor management.

c. Combine face recognition with elevated body temperature measurement.

2 Safety Policy Adherence

a. Track the use of masks in healthcare facilities, office spaces, and warehouses.

b. Enforce the use of personal protective equipment at construction sites, manufacturing plants and refineries.

c. Support contact and activity tracing.

d. Ensure adherence to physical distancing in office locations.

e. Monitor population flows and alert authorities of large group gatherings or frequent non-compliance of social distancing guidelines.

Retail & Commerce

COVID-19 has increased global concern over the spread of disease through contaminated surfaces in public places,resulting in the increased use of contactless technologies to enable touchless interactions. Consumers are increasingly hesitant to handle cash or touch payment terminals[3], with a US study showing that as many as 87% of shoppers would prefer to shop in stores with touchless or robust self-checkout options[4].

Paravision's computer vision toolset can:

1 Enable touchless customer experiences powered by face recognition

a. Provide a secure, frictionless, and safe purchase experience at manually staffed checkout counters or self-checkout point-of-sale (POS) terminals.

b. Deliver completely autonomous shopping experiences that tie payments to an individual's biometric identity, allowing customers to walk out with their chosen goods without needing to go through a checkout process.

2 Ensure safety with computer vision

a. Ensure physical distancing guidelines are maintained while in store.

b. Alert site managers of the need for sanitization of trafficked areas.

[3] Kharif, Olga. 2020. "Contactless Payments Skyrocket Because No One Wants to Handle Cash." Bloomberg News, April 16, 2020. www.bloomberg.com/news/articles/2020-04-16/no-touch-payments-skyrocket-because-no-one-wants-to-handle-cash.

[4] Shekel Brainweigh Ltd. 2020. "87% Of Shoppers Prefer to Shop in Stores With Touchless or Robust Self-Checkout Options During COVID-19 Pandemic." https://www.businesswire.com/news/home/20200407005086/en/.

Air Travel

Paravision's AI-powered computer vision can help alleviate some common challenges for air travel in the time of COVID-19.

Partners may use Paravision's tools to:

1 Enable seamless, contact-free passage despite the prevalence of covered faces

a. Facilitate mobile registration for biometric-enabled travel programs

b. Rapidly validate the identity of individuals at security checkpoints, immigration lines, kiosks, and boarding gates.

c. Support seamless, on-the-move identification and authentication.

d. Create a personal, welcoming, touchless travel experience at VIP lounges.

2 Ensure Passenger and Employee Safety

a. Ensure passengers and airport employees maintain appropriate physical distance at ticket counters, security checkpoints, eGates, turnstiles, lounges, and at baggage drops and collection carousels.

b. Ensure employees are following guidelines for wearing masks or other PPE.

Succeeding **Together**

As a developer of mission-critical computer vision capabilities, Paravision's goal is to offer its partners a comprehensive toolkit to address the "new normal" of a world grappling with COVID-19. The dramatic shift in circumstances around the world demands a sophisticated yet dynamic approach to supporting partners.

To that end, Paravision will continue its commitment to:

Deployment flexibility

Paravision software is structured so that it can be deployed in the cloud, on-premises, or at the edge, supporting leading operating systems and compute platforms.

An integrated approach to identity and computer vision

Paravision's unique ability to combine its industry-leading face and activity recognition offerings allows partners to build applications that holistically address end user challenges.

Collaborative development

Paravision will work closely with its partners to develop capabilities that are useful, powerful and deployable. From gaining market insights to performance testing in the field, we deliver the most value when working hand-in-hand with our partners.

Together, in close collaboration with our partners, we will strive to help organizations maintain safety and security, enabling the speedy return of employees to the workforce and bringing citizens and consumers back to retail, travel and the world around them.

For more detailed documentation,
or to schedule a technical introduction
to evaluate and integrate Paravision's
computer vision toolset, please contact us at

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