IPXAnalytics

Datasheet

QR Code and Barcode Module

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Code and Barcode Module

Compatibility: IPXAnalytics PRO, 2.0 or higher.

IPXAnalytics ' QR Code and Barcode Reading module allows for the instant decoding of labels and codes printed or displayed on screens, using computer vision and advanced AI algorithms. With real-time capabilities, the system ensures accurate and fast data capture. This feature is ideal for applications in access control, production lines, inventory, logistics process automation, traceability, and ERP system integration.

IPXAnalytics

IPXAnalytics is a software that uses artificial intelligence to learn and detect surveillance camera events. The artificial intelligence is based on neural networks and LLMs , which are algorithms designed to mimic the behavior of the human brain. Compared to existing video analytics software on the market today, IPXAnalytics significantly reduces the number of false alarms.

Types of QR Codes and Barcodes:

QR Codes

- QRCode : Standard QR Code
- MicroQRCode : Smaller and more compact QR Code
- RMQRCode : Probably refers to a specific variant of QR Code (e.g. Rectangular Micro QR Code)

Barcodes (1D)

- Codabar
- Code39
- Code93
- Code128
- EAN8
- EAN13
- ITF
- UPCA
- UPCE

Barcodes (2D)

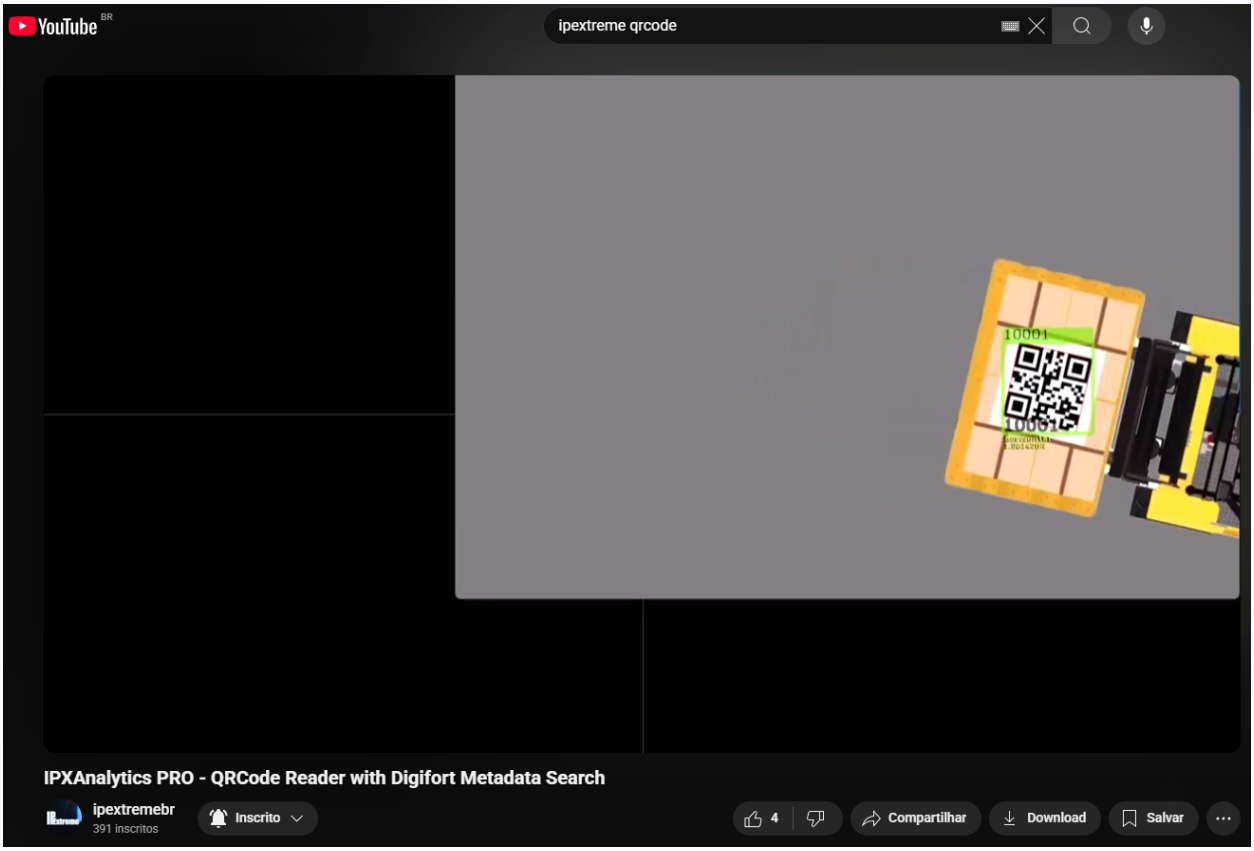
- Aztec
- DataMatrix

- MaxiCode
- PDF417
- DataBar
- DataBarExpanded

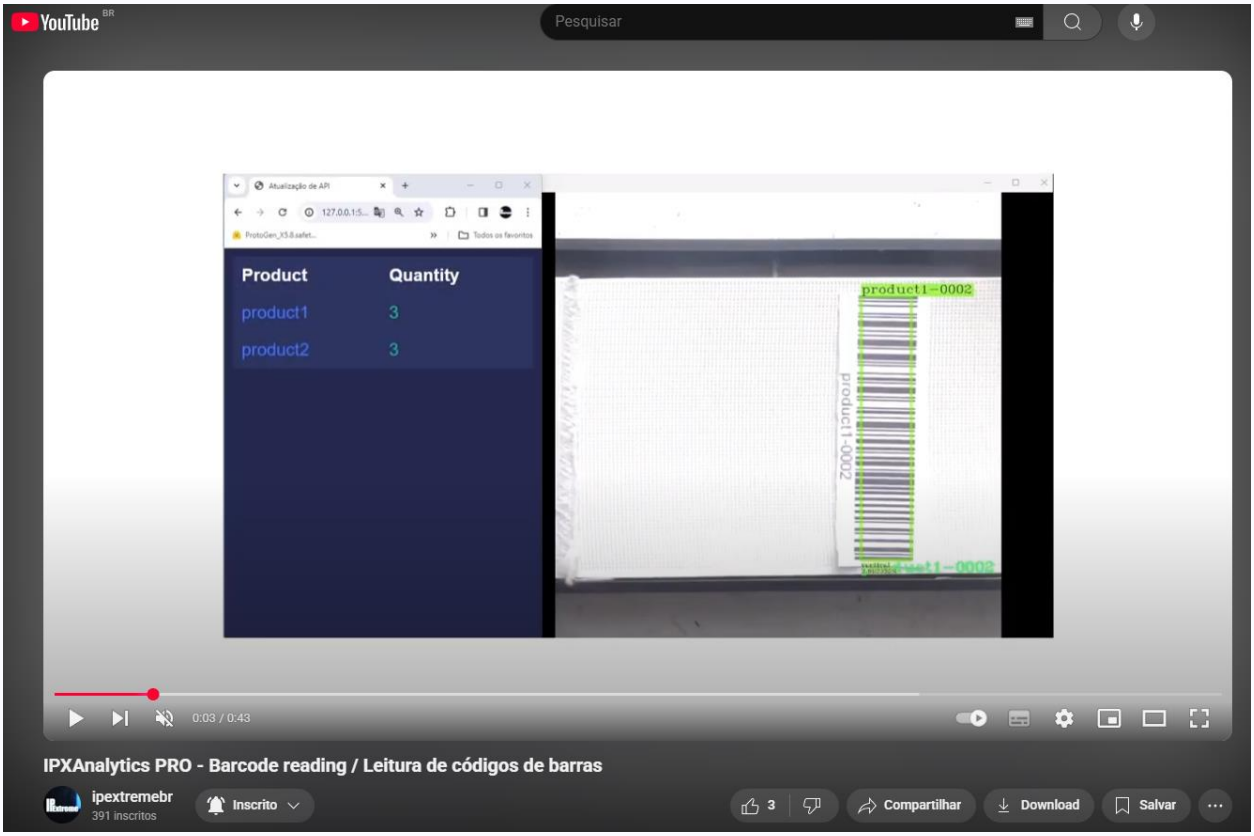
Application advantages:

- Real-Time Reading: Fast and accurate capture and decoding of QR Codes and barcodes.
- Process Automation: Streamlines logistics operations, inventory control, product entry and asset management.
- Intelligent Integration: Connectivity with access control systems, ERPs and databases for immediate validation.
- Cost and Error Reduction: Eliminates the need for manual typing, reducing human error and increasing productivity.

Commercial video



https://www.youtube.com/watch?v=mW3W8MxyRj8



https://www.youtube.com/watch?v=EWEqgHERBqo

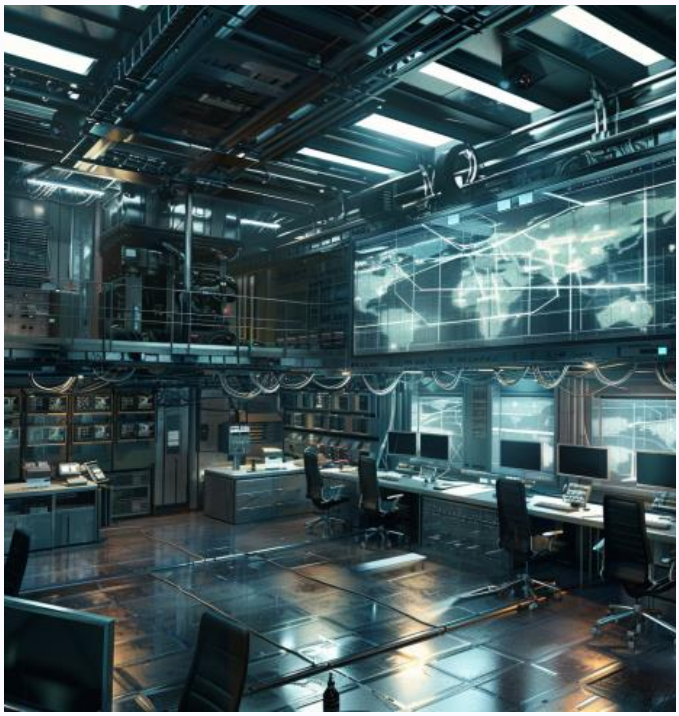
Integration

The software has an HTTP REST API that allows integration with any third-party system. It also integrates with market-leading VMSs: Digifort, D-Guard, Milestone, and Avigilon.

Check with our team about any additional licenses required for third-party software integrations.

For more information:

www.ipextreme.com.br



Customizations

In addition to the various features mentioned here, the software can also assist in countless other situations. It is designed to be customized to meet the customer's needs. For example, in a production environment, the software can identify errors and critical failures in a specific part. To request a customization proposal, contact us through our website: www.ipextreme.com.br .

Limitations and considerations

We understand the importance of reliability in critical applications. Therefore, it's crucial to note that no artificial intelligence software can guarantee 100% accuracy. Our solution offers robust and rapid detection, but we always recommend maintaining backup systems and additional security protocols to ensure a comprehensive response in emergency situations.

IPXAnalytics offers demo licenses and we recommend selling them to customers only after successful testing in the desired environment.

Technical Sheet

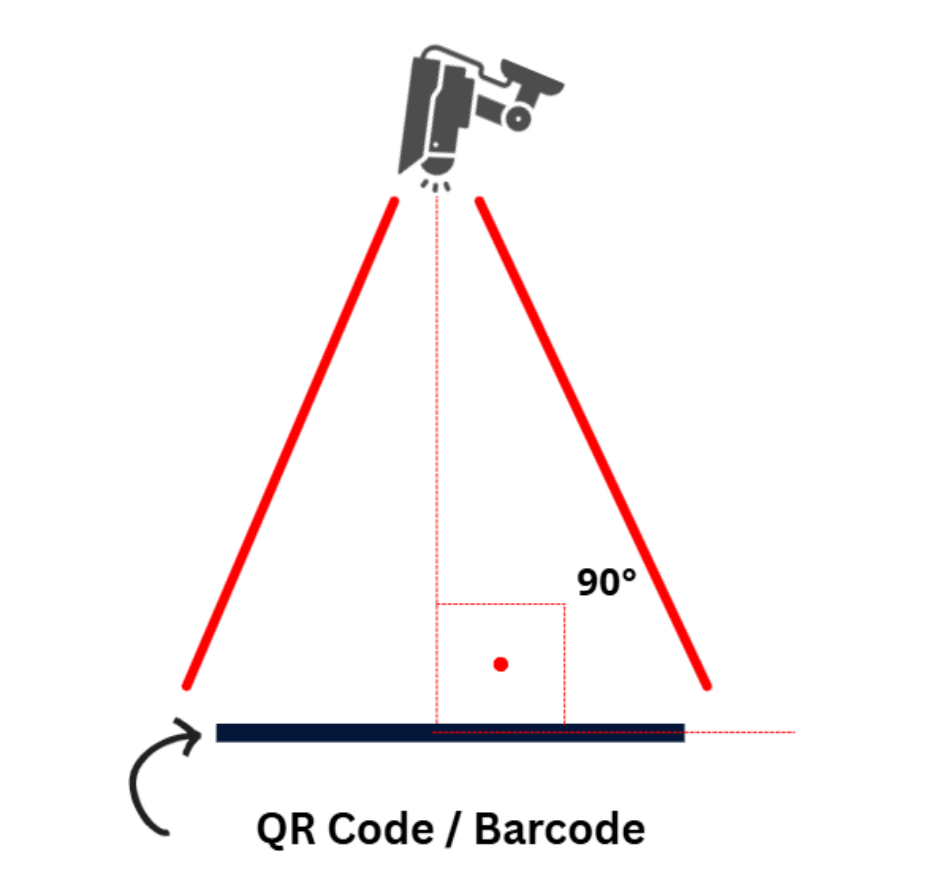
Recommended minimum sizes for detection

A common question is the best camera position to ensure accurate reading of QR Codes and barcodes. The most important factor is the size of the code in the image, not just the camera resolution.

The following table presents the recommended minimum image code sizes as a relative percentage. This allows you to evaluate optimal capture at different resolutions. This ratio is crucial to ensuring stable and fast reading.

Object	Minimum percentage size for identification
QR Code	12.5%
Barcode	25%

Ideal Reading Angle



Just like sharpness and focus, the camera's angle in relation to the code is essential. To ensure efficient scanning:

QR Code : Maximum recommended inclination of up to 45 degrees.

Barcode (1D): It must be positioned as perpendicular as possible to the camera, with a recommended inclination of 90 degrees, as horizontal distortions affect reading.

Shutter and Lighting Adjustment for High-Speed Reading

To ensure accurate reading of QR Codes and barcodes in situations with moving objects (e.g. , packages on conveyor belts, vehicles with stickers, people passing by with badges), it is essential to correctly configure the camera's **shutter time .**

Speed vs Sharpness

- A very slow shutter causes **blur**, preventing the codes from being read correctly.
- A very fast shutter reduces the **level of captured light**, making the image dark or noisy.

Shutter Adjustment Recommendation

- Use **values between 1/500s and 1/2000s** for readings with fast-moving objects.
- For stationary or slow-moving objects, values above **1/125s** are sufficient.
- Always check the image in the IPXAnalytics system : if there is drag or blur, the shutter needs to be faster.

Installation of Supplementary Lighting

As the **Fast shutter** reduces the captured light, it is recommended to install **directed light sources** to compensate for this loss, especially in indoor or low-light environments.

Below are some examples:

Correct: centered code , without distortion and with good

lighting

Incorrect: Code with shadow, distortion, or reflection overlay

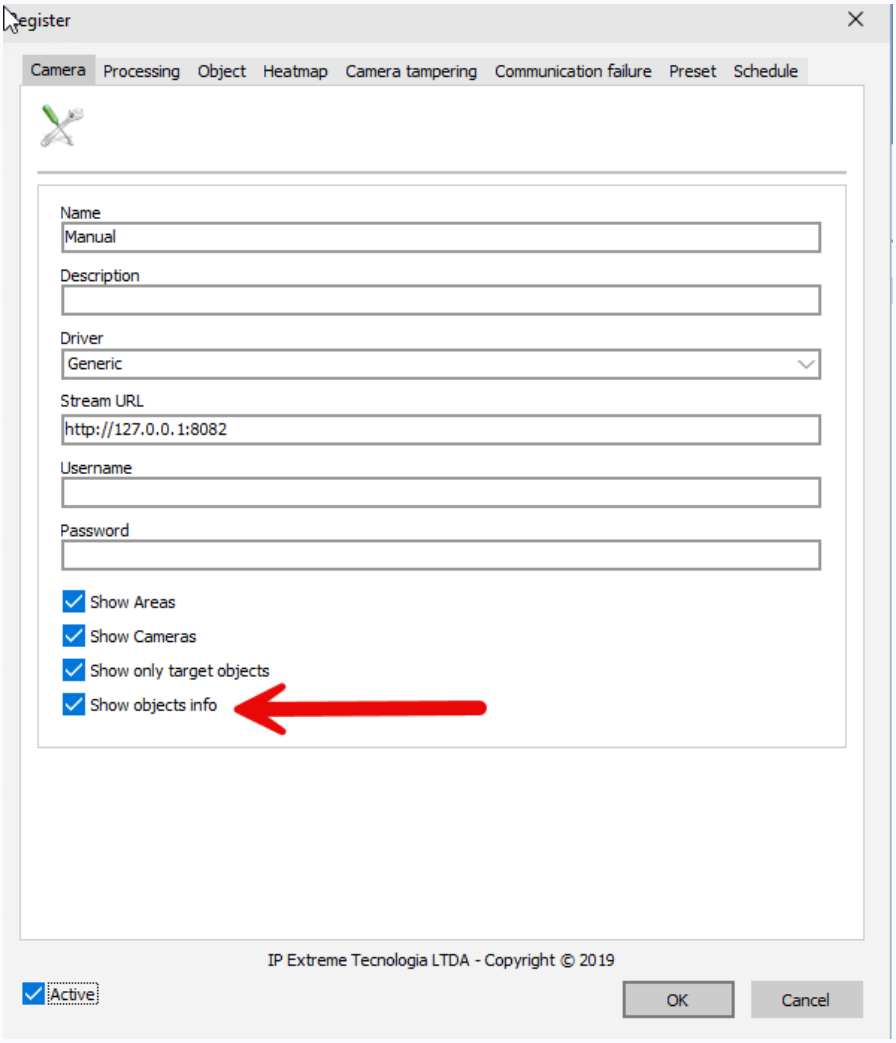
Correct: centered code , without distortion and with good

lighting

Incorrect: Code with shadow, distortion, or reflection overlay

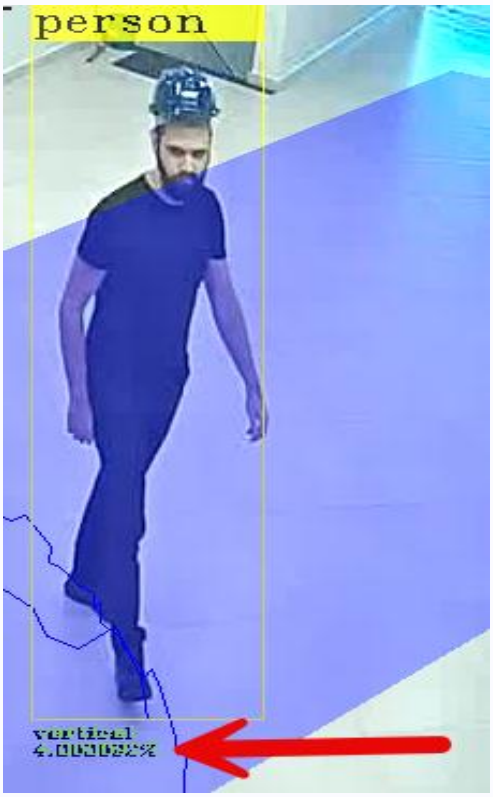
How to identify the size of an object

In IPXAnalytics, you can view the live image in two ways: using debug mode or clicking View in the admin client. When registering a camera, in the first tab, select the "show object information" option. This option will display the size of each object detected in the image and its orientation (vertical or horizontal).



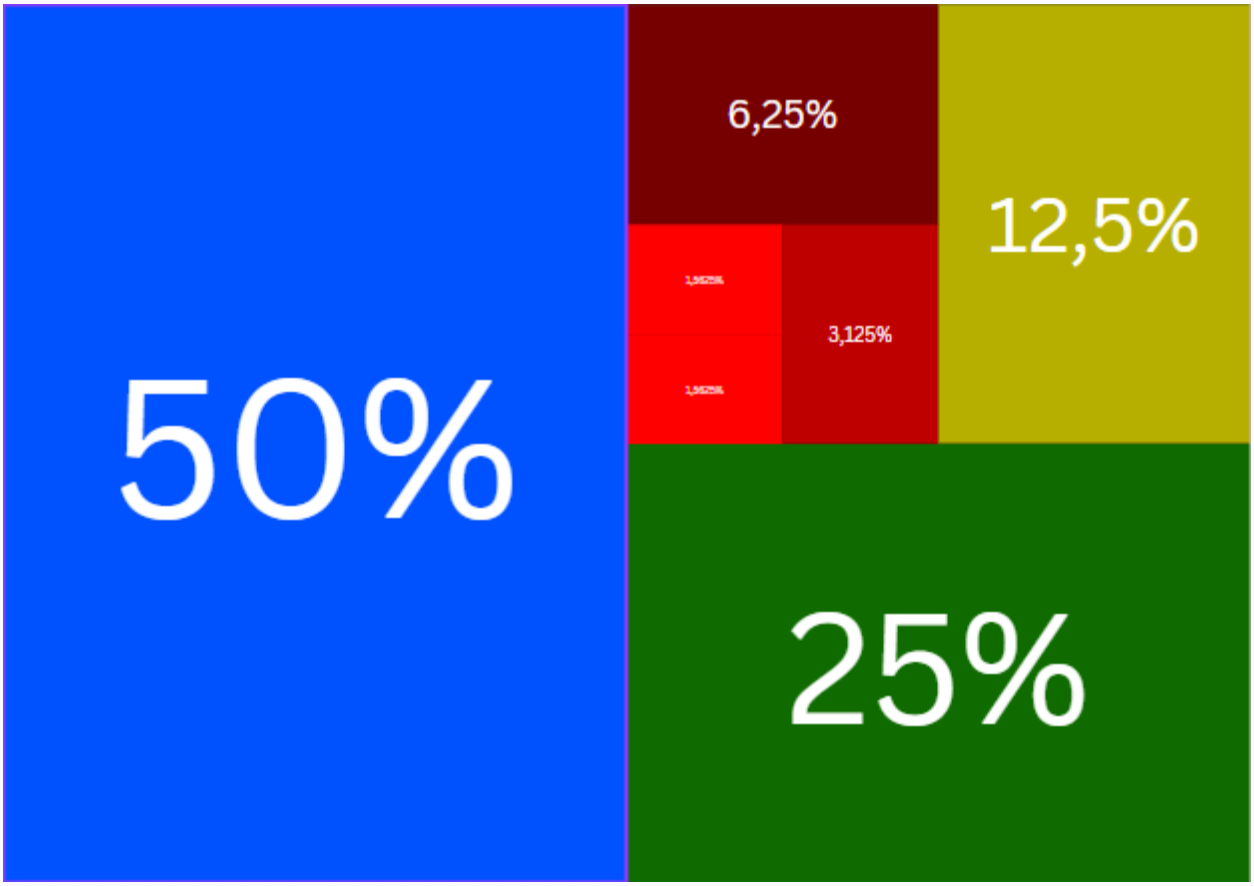
Examples:

One person detected in the image with a total size of 4.0%.

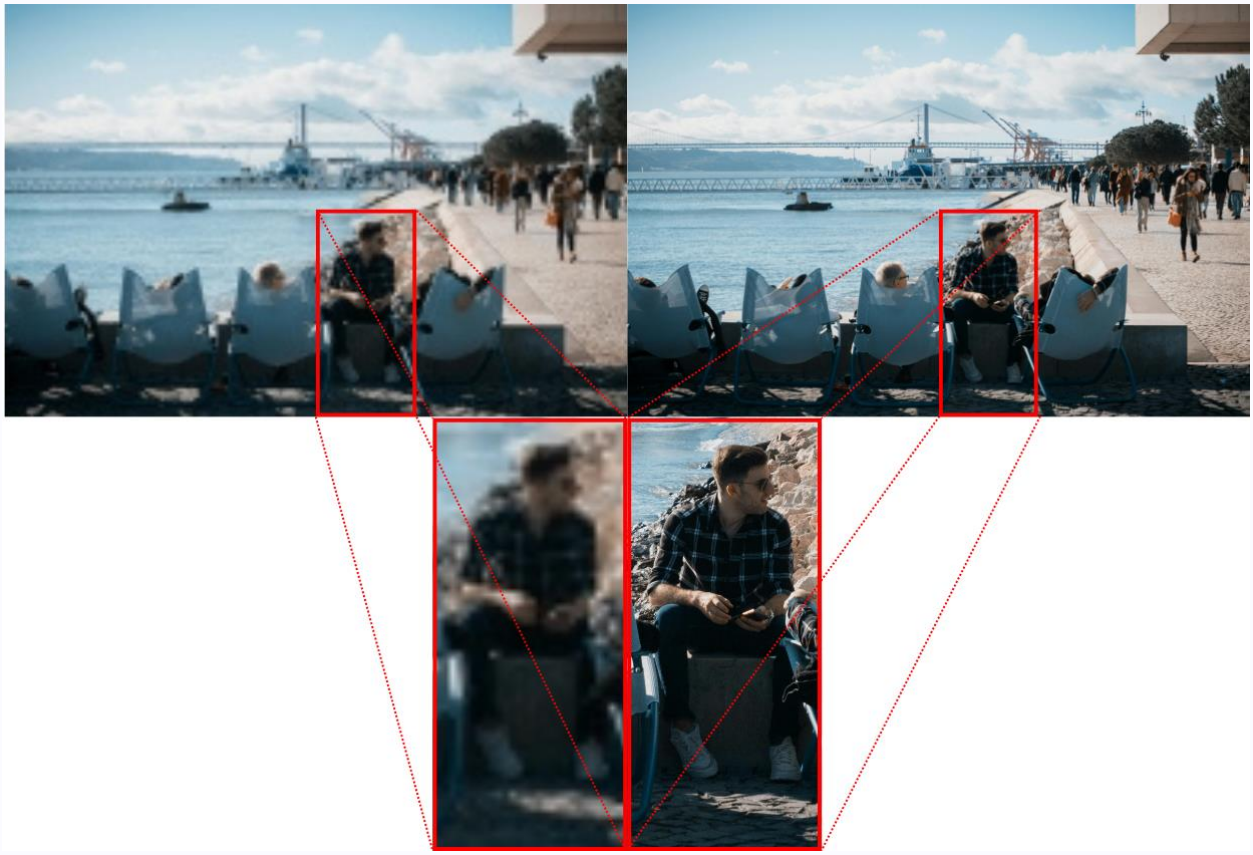


The image was created to visually illustrate the proportion of an object relative to the overall screen. It divides the space into different percentage areas, making it easier to understand the minimum size required for computer vision software to accurately recognize an object.

Each rectangle represents a specific fraction of the total screen, starting at 50% and successively subdividing each area into halves. This way, the user can intuitively understand how different sizes affect detection and what minimum dimensions are recommended for effective recognition.


50%
6,25%
12,5%
3,125%
25%

Optimal camera resolution for object recognition

For effective object recognition, camera resolution is crucial. The minimum recommended resolution for optimal performance is **1024x1024 . This resolution provides sufficient detail for accurate detection and classification while balancing** computational efficiency . Higher resolutions, such as 1080p or 4K, require more processing power without significantly improving accuracy and can lead to diminishing returns. Conversely, lower resolutions can result in blurry or distorted images, making object recognition difficult. Therefore, 1024x1024 is the ideal minimum resolution for reliable and efficient object detection.

Low Resolution vs High Resolution Comparison: