

Revolutionizing Road Safety with AI-Powered Accident Detection





Introduction

Welcome to
*Revolutionizing Road
Safety* with **AI-Powered
Accident Detection**.
Discover how cutting-
edge technology is
transforming the way we
approach road safety and
accident prevention.

An illustration of a car accident scene. A yellow car is shown with significant damage, its front end crumpled. Debris, including pieces of the car's body and glass, is scattered on the dark asphalt road. In the background, a white guardrail with red-tipped posts runs along the edge of the road. The scene is viewed through a large, dark blue diamond-shaped graphic that dominates the left side of the slide.

Problem Statement

Road accidents are a major public health concern, causing significant loss of life and economic impact. Traditional approaches to road safety are no longer sufficient to address the growing challenges.

AI-Powered Accident Detection

- **GOAL** : Develop an AI-powered system to detect and respond to traffic accidents in real-time.
- **OBJECTIVE** : Improve emergency response times, reduce accident severity, and enhance overall road safety.
- **SCOPE** : Focus on urban and highway environments, leveraging computer vision and machine learning algorithms.

The background features a dark blue field with large, overlapping geometric shapes in lighter blue and yellow. In the bottom-left corner, there is a triangular inset showing a glowing blue circuit board pattern. A hand is visible at the bottom of this inset, interacting with a glowing blue rectangular button labeled 'PYTHON' in white capital letters. To the left of the button are three small white gear icons.

Technical Details

- **MODULES** : CV2 , PIL , yoloV4 , JS , HTML , NumPY , Matplotlib , Image , io
- **TOOLS** : Python Programming Language , Google Collab , DroidCam

Real-Time Monitoring

Detecting accidents in real-time through computer vision algorithms and live webcam detection.





Data-Driven Insights

The wealth of data collected through AI-powered accident detection systems offers valuable insights for policymakers, urban planners, and transportation authorities to make informed decisions and improve **road safety** strategies.



Technical Challenges and Solutions

- Challenge: Real-time processing of high-resolution video streams.
Solution: Optimized algorithms for efficient inference on edge devices.
- Challenge: Robust detection in varying lighting and weather conditions.
Solution: Training models on diverse datasets and implementing adaptive algorithms.



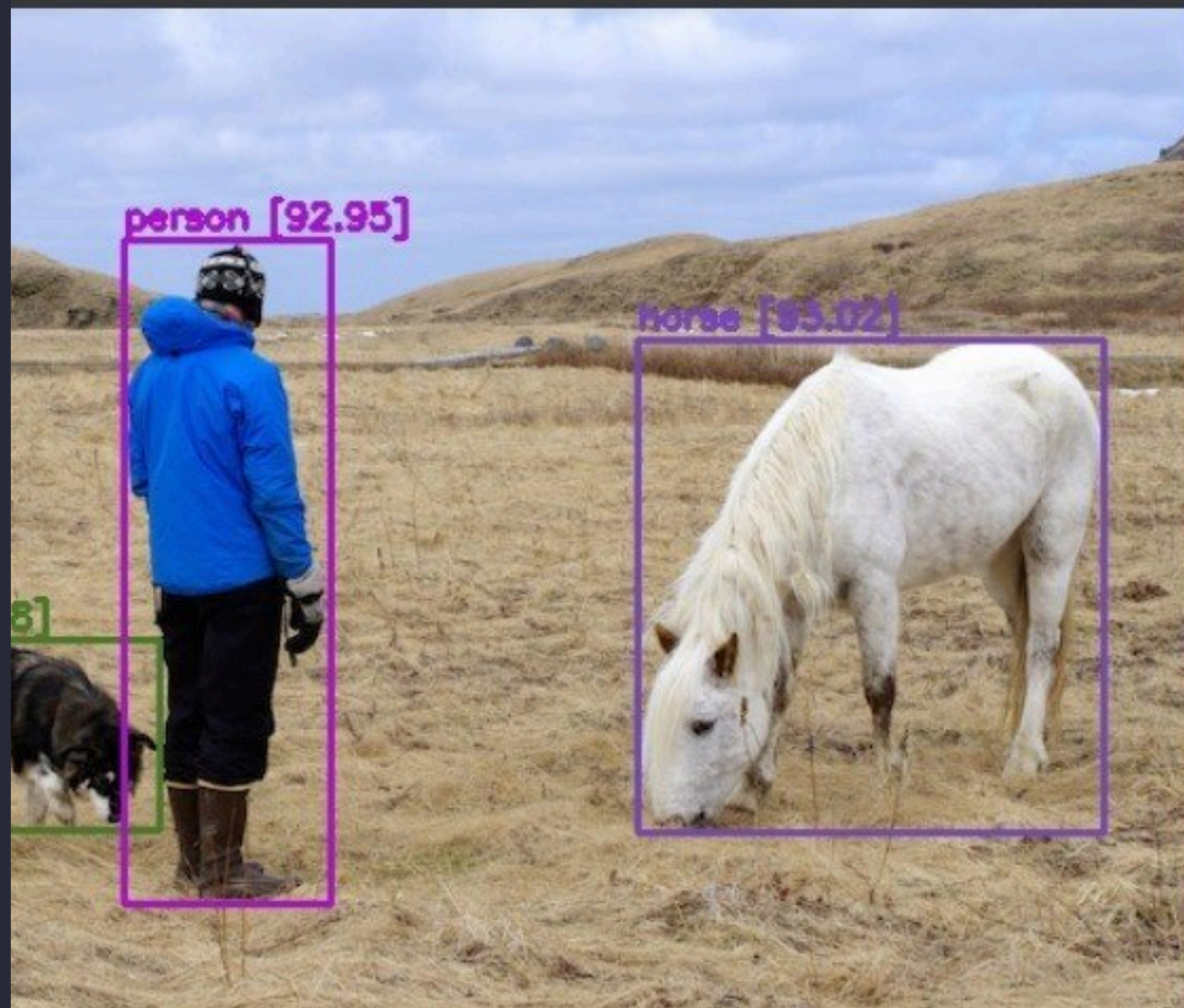
Future Possibilities

In future we are looking forward to enhance this technology with emergency alert SOS (such as medical and fire fighters)

Visuals and Demos

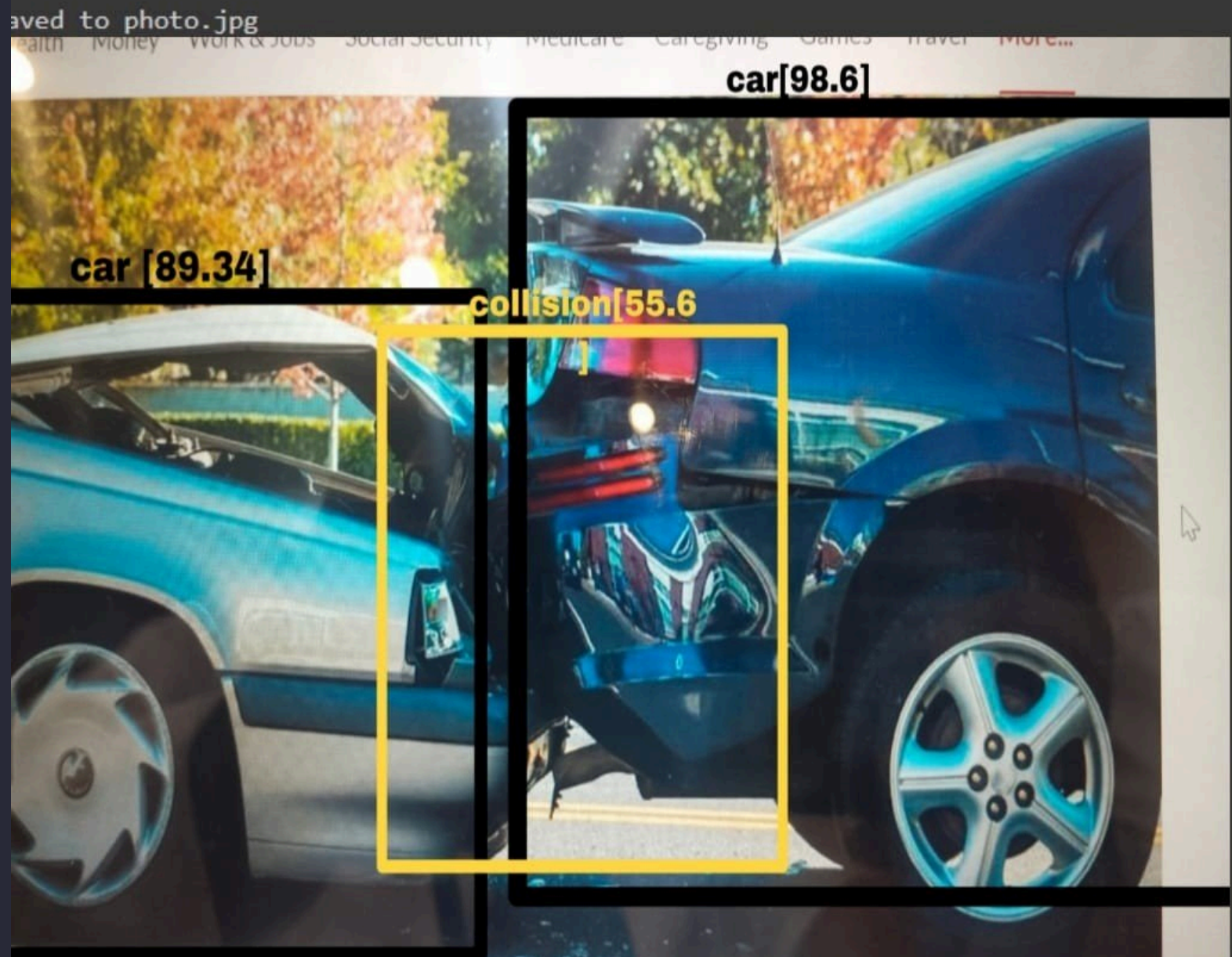
```
ratio, height_ratio = darknet_helper(image, width, height)

for i, bbox in detections:
    left, top, right, bottom = bbox2points(bbox)
    left = int(left * width_ratio), int(top * height_ratio), int(right * width_ratio), int(bottom * height_ratio)
    image, (left, top), (right, bottom), class_colors[label], 2)
    print("{} [ {:.2f} ]".format(label, float(confidence)),
          (left, top - 5), cv2.FONT_HERSHEY_SIMPLEX, 0.5,
          class_colors[label], 2)
```



```
print('Saved to {}'.format(filename))

# Show the image which was just taken.
display(Image(filename))
except Exception as err:
    # Errors will be thrown if the user does not have a webcam or if they do not
    # grant the page permission to access it.
    print(str(err))
```



Conclusion

In conclusion, the integration of AI-powered accident detection represents a monumental leap towards achieving unparalleled **road safety**. Let's harness the potential of technology to transform our roads and ensure a safer tomorrow.

Thanks!

