Playing a class of Game using CNN

Focus on Runner Games

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A presentation for Communicative English course

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Introduction

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- Motivation


Figure: Indranil and Harrison

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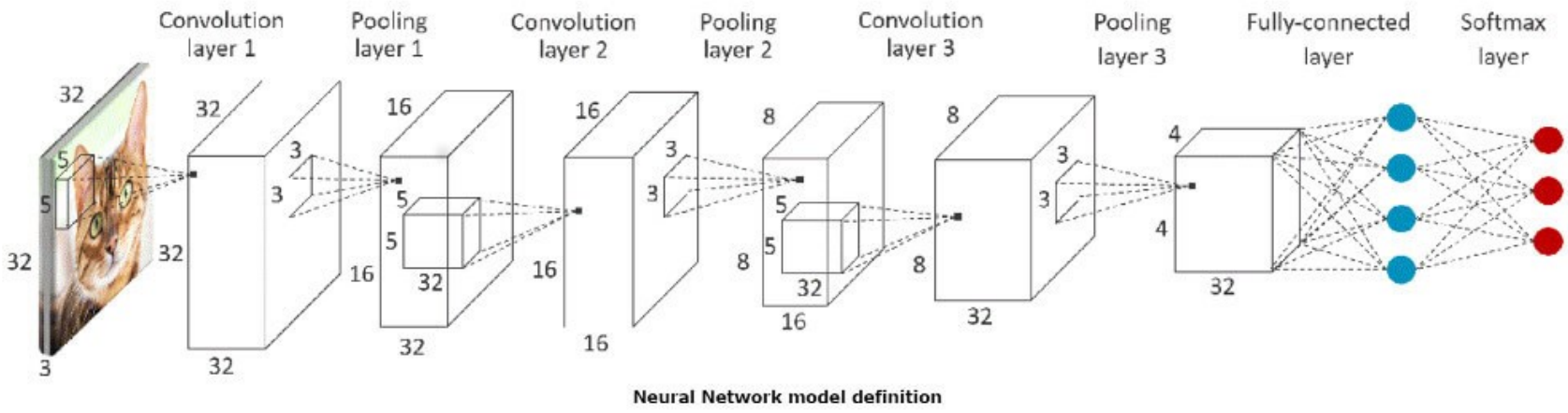
- Cifar 10 model, 80% accuracy in 2010
- Can we make something innovative using simple technology?!



Neural Network model definition

Figure: The famous CIFAR-10 model which we used for training

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Selection of a wrong game!

The game that came to our mind - PONG!
Pong - Simplest table tennis video game from 1972 atari console.

Figure: Uprighted Cabinet of Pong

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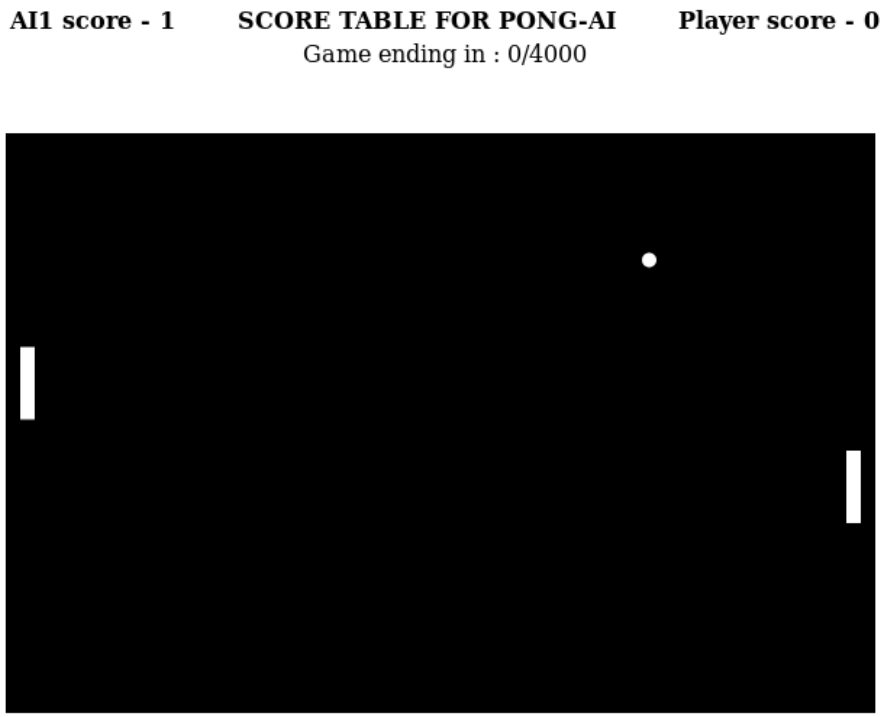

Figure: Our JS implementation of Pong

0
1
1
0
0
1
1
1
1
1

Figure: Data used in training of Pong Game: Frames and corresponding action values (0 - down and 1 - up)

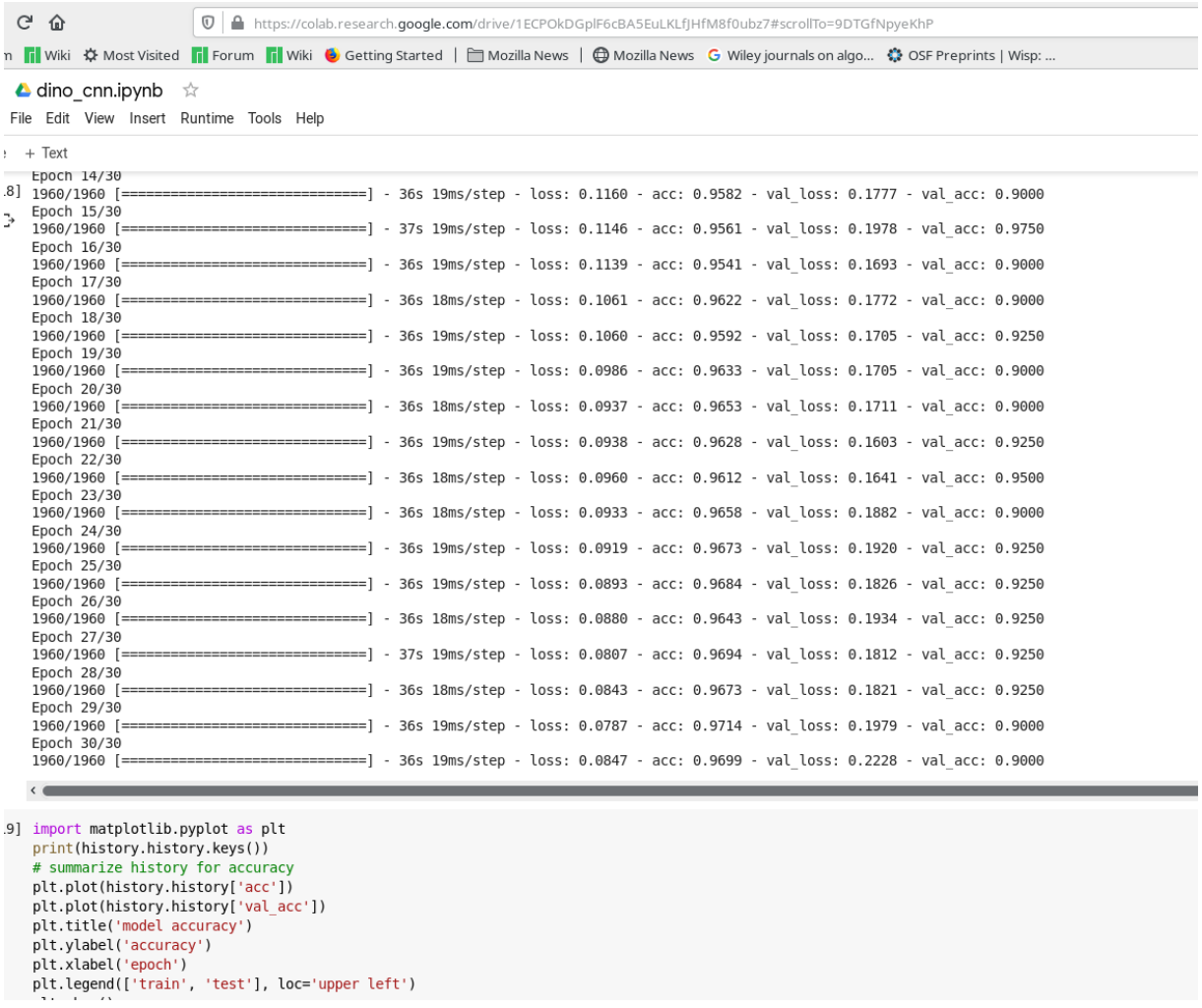

Figure: When training in Google Collaboratory Platform

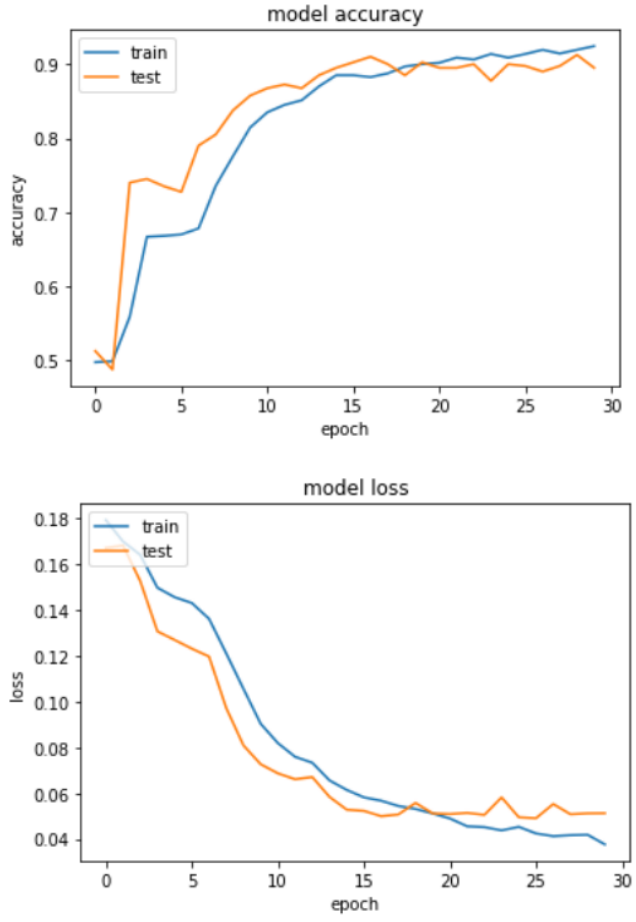

Figure: Loss and accuracy of the Pong game when trained with 2K images

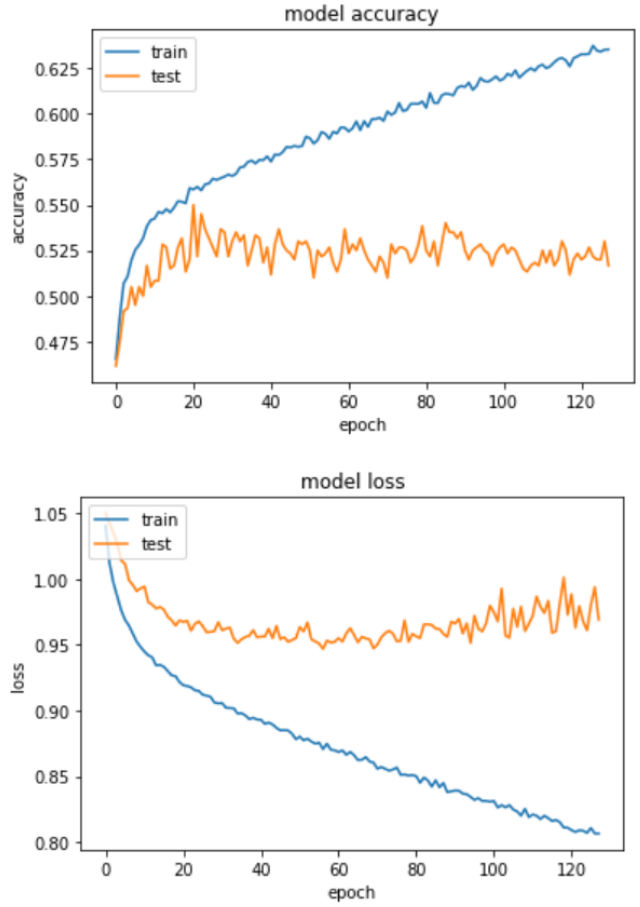

Figure: Loss and accuracy of the Pong game when trained with 30K images

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Why pong failed?

Pong's Computer counterpart is a robot not an AI, it just calculates according to coordinates of the ball. We needed human touch!

- More data more accuracy, what is wrong?

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- More data more accuracy, what is wrong?
- We trained the model using Google's free collaboratory platform, which gives free GPU and is computationally effective.
- Guess the move by looking at the Pong's picture

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Runner Games

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Figure: Famous Dino game!

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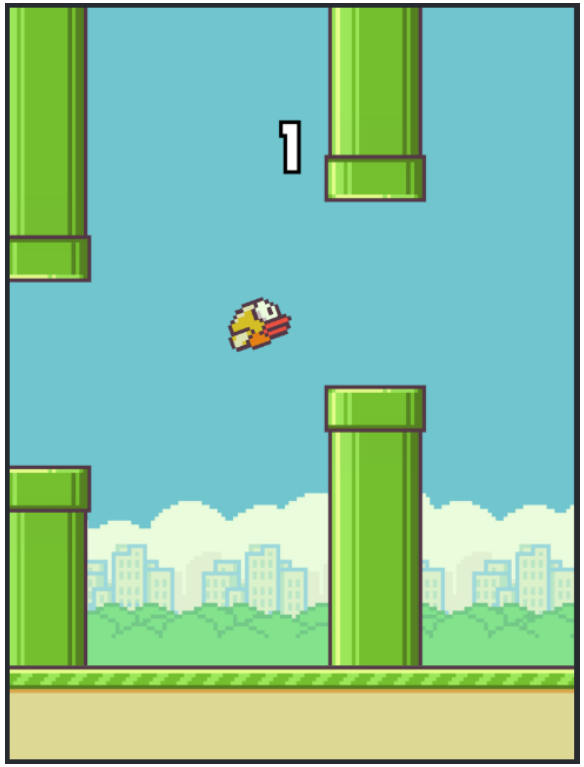

Figure: Famous flappy bird game!

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Figure: Asphalt overdrive game

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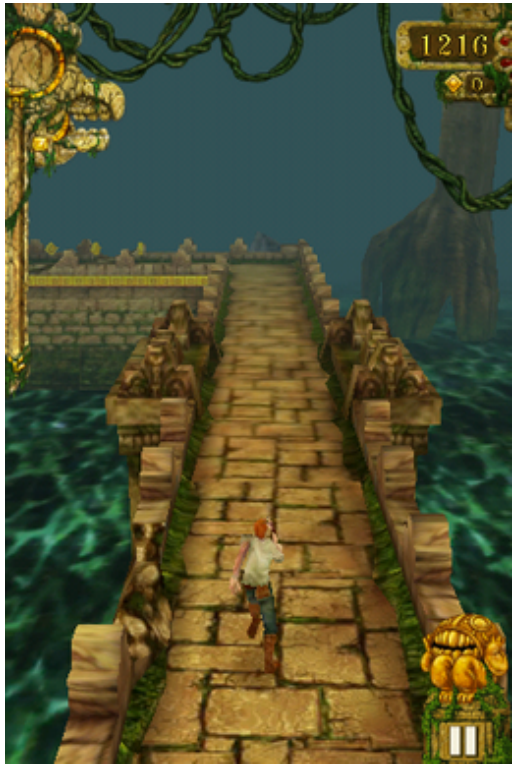

Figure: Famous Temple run game

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Figure: The Road Rash

Runner Games

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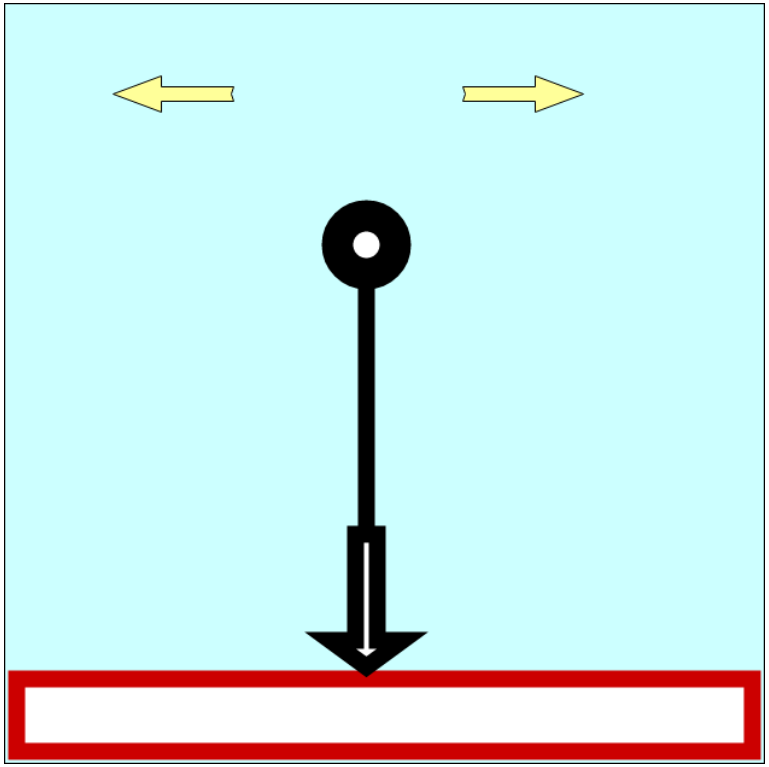

Figure: A custom made game named "Balancer"

Figure: Data used in training of Dino Game: Frames and corresponding action values (0 - nothing and 1 - up)

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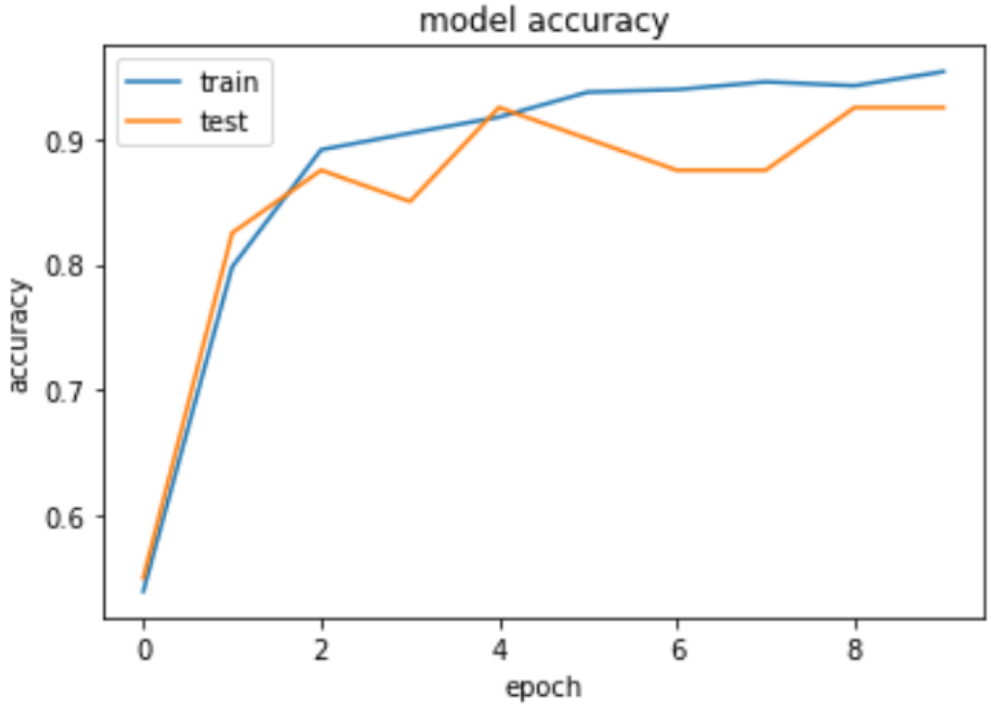
Results for the Dino game

The results obtained are satisfactory. It performed well and runs genuinely with 90% accuracy. From these results we can conclude that certain class of games performs well with just a simple technology like CNN.



Accuracy obtained from Dino game training

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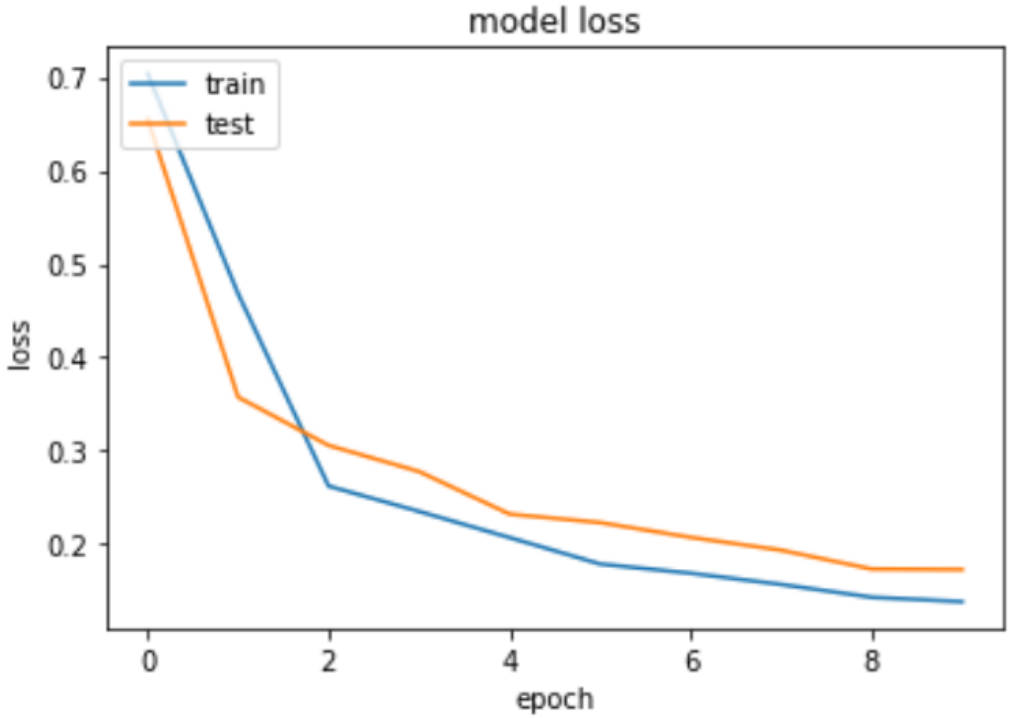

Loss from the dino game training

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Conclusion

Modern technologies and algorithms like Reccurrent Neural Network, Reinforcement Learning, Genetic algorithms are more powerful than the method that was implemented. We will implement these in the Dino game in the near future. The YOLO works on this exact same model, i.e., extract frames from the video and predict from those taken pictures.

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Acknowledgements

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Thank You