Playing a class of Game using CNN Focus on Runner Games

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A presentation for Communicative English course



Introduction

Selection of a wrong game!

Why pong failed?

Discovering a new Class of Runner Games

Results for the Dino game

Conclusion

Acknowledgements



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This was a pet project during my 2nd year on St. Xavier's College!

Motivation





Figure: Indranil and Harrison



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- ► Cifar 10 model, 80% accuracy in 2010

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Figure: Indranil and Harrison

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

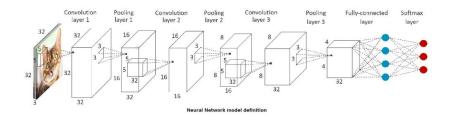


Figure: The famous CIFAR-10 model which we used for training



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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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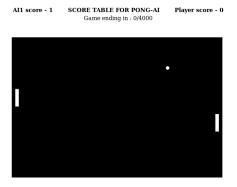


Figure: Our JS implementation of Pong



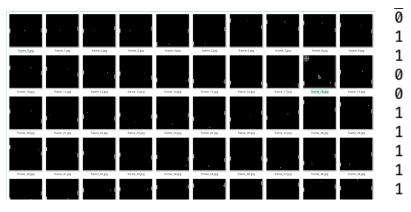


Figure: Data used in training of Pong Game: Frames and corresponding action values (0 - down and 1 - up)



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Figure: When training in Google Collaboratory Platform



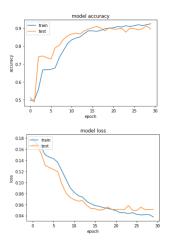


Figure: Loss and accuracy of the Pong game when trained with 2K images

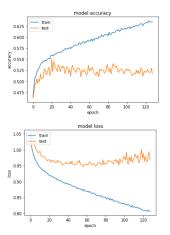


Figure: Loss and accuracy of the Pong game when trained with $30\mbox{K}$ images



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

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- ► Guess the move by looking at the Pong's picture



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Runner games are those kind of games which have a definite move for every instance of the environment

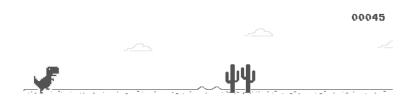


Figure: Famous Dino game!



Runner games are those kind of games which have a definite move for every instance of the environment

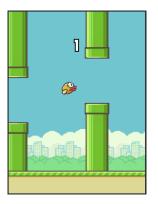


Figure: Famous flappy bird game!



Runner games are those kind of games which have a definite move for every instance of the environment



Figure: Asphalt overdrive game



Runner games are those kind of games which have a definite move for every instance of the environment



Figure: Famous Temple run game



Runner games are those kind of games which have a definite move for every instance of the environment



Figure: The Road Rash



Runner games are those kind of games which have a definite move for every instance of the environment

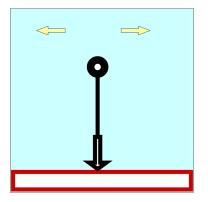


Figure: A custom made game named "Balancer"



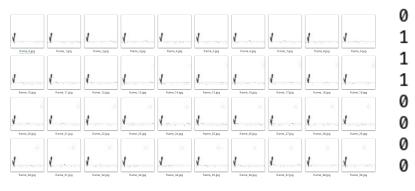


Figure: Data used in training of Dino Game: Frames and corresponding action values (0 - nothing and 1 - up)



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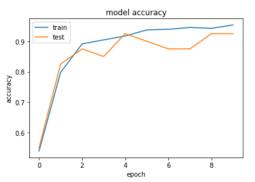
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Results for the Dino game

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.

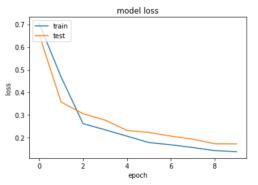


Accuracy obtained from Dino game training



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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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Thank You

