Battlesnake using Deep Q Learning

Petter Amundsen , Tommy Bergsvåg and Håkon Sagehaug

Bouvet

Objectives

Make Deep Q learing nevral network for traning snakes used for playing the game Battlesnake

- Can we use Deep Q learning for traning snakes
- something
- Nascetur ridiculus mus.
- Euismod non erat. Nam ultricies pellentesque nunc, ultrices volutpat nisl ultrices a.

Introduction

Poster for describing the work done for student project in INF626. We wanted to see if we could use Deep Q Learing for training snakes for playing the game Battlesnake. Battlesnake is a game played on a squared board, for training we used 11x11 board. The goal of the game is to survive, for a snake to survive it must; eat, not crash into other snakes and not to crash into a wall - the last snake on the board is the winner. We descried to use Deep Q learning for as the method for training the snakes.
This statement requires citation [1].

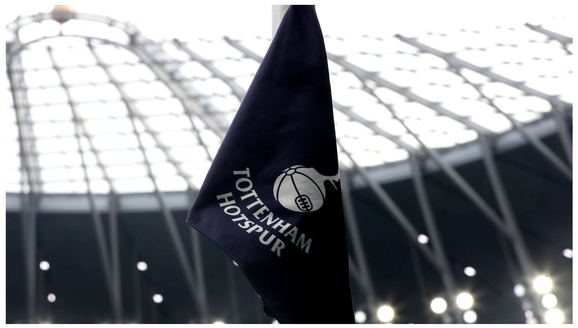

Figure 1:Logo

Materials

The following materials were required to complete the research:jjhjk

- Curabitur pellentesque dignissim
- Eu facilisis est tempus quis
- Duis porta consequat lorem
- Eu facilisis est tempus quis

The materials were prepared according to the steps outlined below:

1. Curabitur pellentesque dignissim
2. Eu facilisis est tempus quis
3. Duis porta consequat lorem
4. Curabitur pellentesque dignissim

Important Result

Lorem ipsum dolor **sit amet**, consectetur adipiscing elit. Sed commodo molestie porta. Sed ultrices scelerisque sapien ac commodo. Donec ut volutpat elit.

Mathematical Section

Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin. Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin.

$$E = mc^2 \tag{1}$$

Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin. Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin.

$$\cos^3\theta = \frac{1}{4}\cos\theta + \frac{3}{4}\cos 3\theta \tag{2}$$

Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin. Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin.

Implementation/Method

Trained three different snakes each having a reward function

1. Snake only gets one point if is the only snake left meaning it won the game
2. Snake is punished when loosing the game, and rewarded when winning
3. Snake gets point if it survives

Then we created three different models using Keras Sequential model with input

1. Shape of the board(11x11)
2. Activation function, here we used ReLU and LeakeyReLU
3. One model with 2 layers and the two with three layers

Results

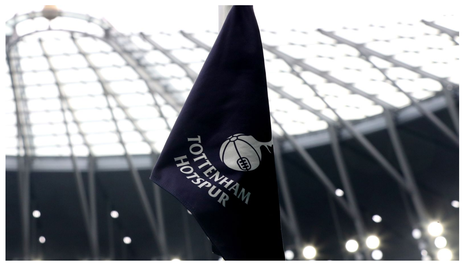

Figure 2:Figure caption

Nunc tempus venenatis facilisis. ssCur abitur suscipit consequat eros non porttitor. Sed a massa dolor, id ornare enim:

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Conclusion

Nunc tempus venenatis facilisis. **Curabitur suscipit** consequat eros non porttitor. Sed a massa dolor, id ornare enim. Fusce quis massa dictum tortor **tincidunt mattis**. Donec quam est, lobortis quis pretium at, laoreet scelerisque lacus. Nam quis odio enim, in molestie libero. Vivamus cursus mi at *nulla elementum sollicitudin*.

Additional Information

Maecenas ultricies feugiat velit non mattis. Fusce tempus arcu id ligula varius dictum.

- Curabitur pellentesque dignissim
- Eu facilisis est tempus quis
- Duis porta consequat lorem

References

[1] J. M. Smith and A. B. Jones.
Book Title.
Publisher, 7th edition, 2012.

[2] A. B. Jones and J. M. Smith.
Article Title.
Journal title, 13(52):123–456, March 2013.

Acknowledgements

Nam mollis tristique neque eu luctus. Suspendisse rutrum congue nisi sed convallis. Aenean id neque dolor. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Contact Information

- Web: https://github.com/petteramu/battlesnakes-dqn
- Email: john@smith.com
- Phone: +1 (000) 111 1111