Senior Comps Ethics Paper

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Throughout this semester we have looked at ways that data gathering and usage can impact people, with a focus on how biased data can marginalize and misrepresent groups of people. This is especially dangerous when data analysis is involved in any sort of social reforms. This is often unintentional and a result of oversight. To ensure my project does not contribute to this, I will be closely looking at each area of my project for any potential ethical issues I am overlooking.

The first part of my project I have to look at is the end goal I want to accomplish. This projects end goal is to create a machine learning algorithm which is able to play Tetris at a high level. Tetris is a video game which is not involved in any sorts of potential potential power distribution. In 2022 over 30 colleges were awarding scholarships to E-Sports (video game) teams. For any of these games, creating a bot presents the possibility of a team abusing it to discover an optimized strategy within a level. This same event has already occurred in games such as chess, and today many chess competitions are decided by which competitors computer could calculate deeper theory (). These are some potential examples of power distribution from Machine Learning in games, but for Tetris the same power distribution does not exist because of how old the game is. Tetris is the most downloaded game of all time, but few to no competitions for serious stakes currently exist. Because of this, I can safely assume my projects end goal will not result in any distribution of power or have any ethical concerns.

To ensure the bot does not have any ethical concerns with its training, the data it will be using is self generated. Even if the bot itself does not present any moral concerns, the source of data could have issues. An example could be cases where data is gathered or distributed without a users consent. A recent example can be seen in Facebook selling user data to tech companies. For this

project, the data will be self-generated so there will be no moral concerns with its background. This projects algorithm learns through many trial and error runs, and finding patterns among the states it has explored. As it plays more the database grows, and its training improves. As a result I can confidently claim that the data itself has no ethical concerns.

One area where my project could present issues is with its accessibility. I will upload my project to Github for anyone to observe and download, but the algorithms performance will likely be correlated to the users computer strength. For people who do not own a strong computer the project will not show the same levels of success. This is because the computer analyses many different potential boards to discover favorable patterns, and better computers are able to analyse a larger quantity of board states in the same time. Furthermore if a user does not own a laptop but rather a tablet or iPad, my project will not even be available for download. This is a large concern which I cannot avoid with my project, so to make it more accessible I will record the training process on my computer and upload it along with the source code. This is not a perfect solution since many people will still not be able to interact with this project, but at least this will allow everyone to witness the algorithm training and playing the game.

My projects end methods and algorithms will be very transparent to the reader. Every step of this project will be visible, and no libraries will be used for training so the user will be able to witness the entire process. There will also be a Github README document which explains how all the components work so the user can better understand the process. The only parts that could be hard to observe are the hidden layers within my neural networks. By nature these are not as transparent as other code, so actually observing these steps can be difficult. However the way these layers function will be explained, and observing them in action can be done through analysing the data it trains on.

There were also no concerns with consent since no people are involved in any step of this projects process. The data is self-generated and the algorithm learns on its own data. The bot does not impact people and cannot play a role in distributing information. The only part that does require consent is the downloading of this project. A video will be viewable but the user has to intentionally download this project to their machine since there is no automatic download. Aside from this small step there are no aspects in this projects development which could involve requiring a users consent.

Regardless of my projects performance the code will be posted to a public

Github repository. Downloads will be available at all times so no upkeep needs to be done for this projects distribution. There will also not be any upkeep on the project itself because once the algorithm is coded it can be trained at any time. New versions of Python may come out which are not compatible, or an improve ML algorithmic approach may present itself, but for the scope of this project there will be no upkeep. The purpose is to achieve the best score I can given my current resources. In the Github repository will be the untrained bot, a README file explaining how it works and how to try it out, and a video showing the training process in action. The trained bot will also be uploaded to the repository if it is not too large, otherwise a video of its fully trained performance will be added in its place.

Currently using technology is not the best way to play tetris, but this will likely change as computers become more advanced. The 2022 Tetris world champion is able to achieve a score of 1.28 million, which is much higher than what most Tetris ai can accomplish. However as computers and computing power improves the potential for machine learning increases, and it likely wont be very long until an AI can beat the Tetris world champion. Overall I believe my project can be completed in an ethical manner. My project has little impact on peoples lives since its end goal is to play a 38 year old game at a high level.