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Machine learning in videogames

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One of the most interesting features in modern videogames are the new complex A.I. systems used to deepen gameplay and user experience. However, people may mistake A.I. with Machine Learning (M.L.). While A.I. is scripted in its entirety, M.L. has an agent with no knowledge about the game and with his own expertise, the agent adapts to the game to fulfil a specific goal. While true M.L. has not been implemented natively on any game, there was one game that gimmicky “implemented” machine learning in its product named Amiibos, which promised that these NFC figures “learned” what the player did and counter attacked its game style. What really happened was that with elapsing time, the NFC figure will get better, with or without proper training, concluding that true M.L. isn’t applied. However, an ex-Microsoft employee known by the name of “Sethbling” applied M.L. in two very famous games; *Super Mario World* and *Mario Kart 64*. Using neural networks and genetic algorithms Sethbling was able to make the CPU learn the stage and jump around to get to the goal in *Super Mario World*, while it made the CPU pick up on the track and get to the 1st place on *Mario Kart 64*. A lot more examples like this have been made, however, how can we start implementing M.L. natively on games? We will focus on one type of M.L, in this case Genetic Algorithms, and explain how it can be used in different genres of videogames and how can we implement the most basic genetic algorithms to any game, like player decision systems for enemies to learn and act upon repeated player actions, or make agents learn the advantages and disadvantages of the environment around them.

Biography

Esteban Gil Martínez is a student in Computational Systems Engineering. He has worked personally and educationally on past and ongoing videogame development. Currently interested in game design, development, and programming and Machine Learning inclusion in videogames.

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