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Math 5010

Game Theory Podcast Script

-*Sound bit of “Lets Get Ready to Rumble”*

Alright so there going be talking about game theory and what it is when it's used for kind of how it started and the break throughs that have happened over the years so game theory what is it exactly game theory is a branch of mathematics that deals with the analysis and strategies behind competitive situations where the outcome of one participants choice is dependent on the actions of another participant so kind of in layman's terms game theory is a way to quantify a decision that you want to make based on somebody else’s choices that have already been made game theory has a lot of uses from simple games such as tic tac toe checkers chess all the way up to military applications when making decisions whether to not to launch missiles nuclear weapons or to attack a specific installment of some kind there are also other fields that it's used in mainly economics and finance where you want to maximize your profits in the stock market you don't know exactly what the stocks are going to do but game theory helps to analyze what the trends are and what future outcomes might be so you can say sell your stock or buy stock at a determined value wear either you get the best value for it or you get the most return out of your basement other things that game jerseys for sports different management situations in business and other such business and and manager and all applications so how did this all start who came up with game theory and how did they come up with it so how it started in the beginning the first documented case of somebody calculating strategy was a guy by the name of James Walgrave the First Earl of Walgrave he was born in 1684 and he provided us with the first actual recorded history of a strategy solution for matrix game so basically he was the first person in recorded history to come up with a written calculated solution for a game the game that he came up with that he was able to calculate this are winning strategy for it was called *le Hur* he came up with this game with a friend it is called Pier Remount Mark and 1713 basically the game is played with 2 people to people are called Peter and Paul it begins with Peter dealing a card at random from an ordinary deck of cards King queen and so on then he deals a single card to himself neither player sees the cards dealt with each other and object of the game is to be the person that has the highest value of the car at the end of the game so Paul he looks at his card and he's not satisfied he can force Peter to exchange cars with him to try to get a higher value card then if Peter is still not satisfied with the card after his exchange he is permitted to exchange that card with the card in the deck at random then the 2 players compare cards and the person with the highest card wins so that's how it's played and James Walgrave was able to calculate a winning strategy for this going to give a short explanation of what he was able to calculate um to get it when strategy is he kind of collaborated with Nicholas Bernoulli and was able to come to the conclusion that if Paul is dealt paid 7 or less than he should exchange but if he's jealous 7 or higher then he should keep his card and this was what they concluded as a winning strategy so if you want to test this out plan a game for yourself look up the rules in more depth and the side for your own if this strategy actually works if you use this strategy and it does work great if not find out what you think would be a better strategy alright will meet on the 17 hundreds was a long time ago and James Walgraves did have some great ideas but what has come about with game theory and modern time so who you credit as the father of modern game theory is a man by the name of John von Neumann so John von Neumann was a professor at Princeton University where most of the major break throughs of game theory have come out of in the past 100 years John and his colleagues delved into game theory in hopes to end World War one which was going on the time when he was there and was a great and terrible thing and they tried to come up with things that could help end the war for the United States and rest the world in his efforts he was able to help dad with the war effort and we know that World War one ended with arms agreement not much after his work was published but would you do know is that the application of game theory would have so many more areas in fields of study that would benefit from it namely economics will talk about the applications of game theory to economics in just a bit but I first want to talk about the next breakthrough with game theory and it came by way of a man named Alan Turing during World War 2 in World War 2 the Nazis had a code machine that was very famous and will stop to be unbreakable this code machine goes by the name of enigma and it had over 500000000 million different combinations in it where you would punch in a message and it was you would send it to different settings it would spit out a random would seem to be random letters and you could send it across telegram and the other person on the other side could decipher it but to everyone else I was listening and it was just random jumble of letters well this was a problem for the allied forces and Germany and Aussies were marching all over Europe and no one can stop them Alex ring was recruited to help break and enigma and was brought to Bletchley which was a secret facility that was covertly head as a radio factory during this time there he was able to break it enigma by way of a machine that he created called Christopher. Christopher would later time to be known as the first computer or artificial intelligence this was a great and huge breakthrough for game theory because this was an actual machine calculating what would happen in certain situations and how to make a winning strategy of it because this was huge for the allies and was a great tool in order to win World War 2 and not only did it help in the war but what would life be like without computers nowadays literally everything is Reynolds computers we have in our hands we have in our pockets we came around more backpacks everything is run with computers is so Alan Turing not only helped advance game theory help end the World War 2 but has changed the course of the world forever chase now back to how game theory affected the field of economics so John von Neumann first created it to help with the war effort in World War one while later he found applications for economics and he was accredited with saying something to the lines of economics is doing the best thing for yourself kinda like survival to finish Twins and that was what was taking his gospel for most of the early 19 hundreds into the 19th comes along a man by the name of John Nash who again at Princeton University added his name to a great list of people who have benefited the world with the application game theory John Nash was a baby HD student at Princeton University trying to come up with original idea to get him this great grant at the Wheeler research labs well he tried lots of different things and couldn't come up with anything well one thing that he did enjoy was going to the local bar and at the bar he was not the greatest with the ladies so he would most the time end up going home alone well his colleagues game Tried to get girls to talk with him and he could get a good laugh out of it but that's what John had an epiphany about how to maximize his chances with women so he was confronted by colleagues saying, “Hey look there's this girl across the way she's giving you the look go talk to her well John being the genius said he was going to win with the strategy he made up on the spot to win well what he did was he thought if we all go for the hottest girl of the group she's going to turn everybody down because she holds all the power and she'll just turn everyone down and so the next step is everyone goes for her friends well her friends don't like that because I don't want to be second choice so they get shot down again well he came up with like well what if we don't go after the main girl we just go after her friends first now her friends don't feel left out they don't feel like the second choice and so we all get laid tonight well this idea and that he thought about at a bar became his original idea which he came up with which we now call the Nash equilibrium basically built of what John von Neumann said was you know you do whatever is best for yourself well John Nash kind of felt that was an incomplete thought where she was he came up with was you do what's best for yourself and the group so everybody ends up winning or getting laid that night but this is what people use in economics as the Nash equilibrium as the optimum point of value where you sell or you buy socks and many other applications at this is war end consequentially John Nash won a Nobel Prize for his work in this field of game theory and economics if you're interested in learning more about Alan Turing or John ash the Hollywood version of their story is available Alan Turing was memorialized in a movie called The Imitation Game played by Benedict Cumberbatch and great movie and John Nash was memorialized in a movie made couple years back called a beautiful mind with Russell Crowe both great movies both have great ideas about game theory and this applications and the developments that they were able to come up with through the years so if you're interested check those out but I'll be signing off tonight been great talking to you guys game theory rocks go check it out tonight.