Week 2 Reflection

* **What have I learnt this week?** In Week 2 of Introduction to Human Centered Complex systems, I have learnt what a model is, what makes a good model and the different types of models.
* **What do I 'now know' that I did not before?** I now know what I haven’t learnt before is the definition of a model, which is a representation of a system.

I also now know what makes a good model, which I can confirm now is one that is the most realistic and the least complex compared to other models.

I also now know why we should model, these answers include to better understand the data of the system, to also allow clearer thinking and also to simplify complex systems.

* **What insights have I gained?** One of the main insights that I have gained about modelling is there are vast advantages of modelling, which includes it allows us to apprehend the data of the system better. This data that is produced can also be analysed which can lead to improvements in the system. Another benefit of modelling is it explains the system better, which will enable the individual to understand the system in a more simplistic way.
* **What are (my/the) perceived strengths and weaknesses that I have observed?** One of the perceived strengths is that I am pretty good at analysing data, so this will be beneficial in modelling as throughout modelling, data has to be analysed and inspected. One of the disadvantages that I have observed is that my designing skills are not up to scratch as I am not good in drawing or creating things. I have that is a big disadvantage as there designing models is very important in modelling.
* **What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As discussed above one of the main challenges that I have observed is my drawing skills are not up to scratch. I haven’t handled the situation of my drawing skills well because I have just realised during the tutorial that modelling requires a lot of drawing and creative skills in order to be good at modelling as it is a fundamental part of modelling.

Another challenge that I encountered/observed is that I still haven’t created a group for the group assignment. This wasn’t handled well because I am still a new member of the class with myself not knowing too many people within it.

* **What would I do better next time and with what anticipated results?** What I could do better next time as in, in the future lessons is to do online tutorials in order to improve my drawing and creative thinking. What I could do better next time in terms of the groups being chosen for the group assignment is to try and get into contact with a bunch of people within the class in order to get to understand their strengths and weaknesses. This will also help me to have more opportunities to be with the right group.
* **What theory proved to be useful and why?** What have I learnt from this? The theory that provided to be useful is why we should model. This was very useful as it enabled myself to understand the benefits of it towards complex systems.

Another bit of theory that provided to be useful is the several uses of models, which include to reason, communicate, explain etc. This was extremely useful because it allows myself to understand models better by seeing what it is used for.

Another bit of theory that provided to be useful is the types of models. This was very useful as it helped myself to understand the different approaches that are used to different models that have been created.

Week 3 Reflection

**What have I learnt this week?** This week I have learnt about different models that have been used for human purposes. These models that have been learnt include how humans behave, how they make decisions, how people reveal information that is hidden, how people add value and power within groups as well as how different groups solve problems.

**What do I 'now know' that I did not before?**

One of the main things that I now know that I didn’t know before is what rational models. I now understand that rational models are models that suppose people behave in a way to make effective use of goals such as revenue etc.

Another thing that I now know that I didn’t know before is rule based modelling in relation to understanding how people behave. Rule based modelling is when models are created to work out rules that people are using which inevitably will suggest the way they will behave. I now also know that this is done by using psychology.

**What insights have I gained?** One of the main insights that I have gained is models have been created in order to analyse the interactions of humans, which helps people understand the decision making process and the various perspectives humans have.

Another insight that I have gained is that signaling models can be used for many purposes, such as used in economics for both linear graphs and curves. I have also gained the insight of probability playing an important role in the way people decide especially when uncertainty is involved.

**What are (my/the) perceived strengths and weaknesses that I have observed?**

One of the perceived strengths that I observed was I understood decision trees pretty well, which is mainly due to the fact that I have studied decision trees in mathematics when I was in high school. Another perceived strength of mine is I understood classical, frequency and subjective probability also mainly because due to myself studying this in mathematics in high school. One of the weaknesses that I have observed is understanding the Shapley value mainly because the formula is a bit complicated to understand.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above one of the main challenges that I observed throughout the week was I found it difficult to understand the Shapley value. This issue was handled well due to the fact that there were videos on Canvas, which enabled me to understand the Shapely value better.

**What would I do better next time and with what anticipated results?** One of the things that I could have done better to understand the Shapley value better the first time was to do some pre reading in terms of the Shapely value before the Workshop started.

**What theory proved to be useful and why? What have I learnt from this?**

One bit of theory that proved to be useful is understanding how people solve problems in groups. This is extremely useful because in workforce in the future there are a lot of activities that require problems to be solved as a group. Therefore learning the recombination, team diversity etc. can be used to solve problems in the workforce.

Another bit of theory that provided to be useful is models that suggest how people decide. This is because decisions are vital in everyday life and it is important to make the right decision. Therefore analysing decision trees allows for better decision making for individuals and businesses.

Week 4 Reflection

**What have I learnt this week?** This week I have learnt about three ways to represent complex adaptive systems, which include system dynamics models, network models and also agent based models.

**What do I 'now know' that I did not before?** I now know what system dynamics models and also what agent based models are as I didn’t know what they were before this week. System Dynamic Models are models that help understand the nonlinear behaviour of complex systems by utilising things such as feedbacks and delays. I now know that agent based models cover a collection of agents who make decisions within the system after evaluating the situation.

**What insights have I gained?** One of the main insights I have gained is these models can be applied to big current real world situations. For example, we have seen agent based models be applied to potentially one of the biggest world issue currently which is COVID 19. By using agent based models we have seen different scenarios of solutions to the virus and the various impacts that it can have on the whole world. Another insight I have gained is network models are increasingly being used in the world.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One strength that I have observed is in terms of what was being taught about network systems, I learnt about it pretty well.

Another strength of mine is I understood the link between agent based models and preventing COVID 19. This is due to two factors which include myself having a deep interest in the prevention of COVID 19 as well as the material covered in class to be concise and easy to understand. This is because I learnt about nodes, network structures and examples of networks etc. during the HSC Course of Information Processes Technology.

One of my perceived weaknesses was originally I didn’t understand much about what system dynamics models were and what its perceived purpose is etc.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above the main challenge that I encountered was I didn’t understand system dynamics models. This was due to the fact that I have had no exposure to them in the past throughout my learning experience. The situation was handled well though, because I did further research into what system dynamics models are and its functionalities etc.

**What would I do better next time and with what anticipated results?** One of the things that I could have done better next time is I should have done some pre reading before this week’s workshop. By doing this will mean that I would have understood more information about system dynamic models and would have saved me time in the long run as I wouldn’t have needed to do extra research.

**What theory proved to be useful and why? What have I learnt from this?** The theory that proved to be the most useful was understanding agent based models because I was able to see how it can be used to show how to prevent real world issues by mapping out different situations and scenarios.

Another bit of the theory that proved to be useful is comprehending network models. By learning different types of networks such as LinkedIn will be able to increase the connections of individuals, which increases the likelihood of finding jobs controlling the worldwide issue of unemployment.

Week 5 Reflection

**What have I learnt this week?** This week I learnt about different distributions in order to understand complex systems better. These distributions include probability distributions, normal distributions as well as long tailed distributions.

**What do I 'now know' that I did not before?** There are many things that I now know that I didn’t know before. One of the main things that I now know than before is the definition of long tailed distribution. The definition of long tailed distribution is when the distribution is positively skewed and then has a lot of occurrences of an event, hence given the name long tail. I have also learnt the definition of normal distribution, which I didn’t know before. The definition of normal distribution is how different variables are distributed.

**What insights have I gained?** One of the main insights that I have gained is probability distributions, normal distributions and long tailed distributions are used to model real world activities in particular through complex systems. For example probability distributions can help businesses analyse what is the best and worst cases to implement a particular event by identifying the different probabilities of the events.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of my perceived strengths that I have observed is that I understood probability distributions well. This is due to the fact that I have studied probability distributions in Business Statistics which is a subject at UTS and I also learnt it during Year 11 and 12 while in High School.

One of the weaknesses that I have observed is understanding long tailed distributions and its link to complex systems. The main reason is because I have had no exposure in learning about long tailed distributions. Another weakness that I have observed during my learning experience is during the lesson I had some difficulties understand Zipf’s Law.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above, one of the challenges that I encountered was understanding the link. It was not handled too well as I didn’t do any pre work. However I did further research to consolidate my understanding of the link between long tailed distributions and complex systems but it took a long time to realise the link.

As mentioned above, one of the challenges that I had encountered is understanding Zipf’s Law during the workshop. I handled this challenge well as I did some post Workshop research and then understood it well because I have a decent understanding of graphs.

**What would I do better next time and with what anticipated results?** One thing I could have done better in order to understand the connection between long tailed distributions and complex systems is to do pre reading before the workshop started.

Again one of the ways that I could have handled learning Zipf’s Law is by doing some pre research before the Workshop started.

**What theory proved to be useful and why? What have I learnt from this?** One bit of theory that proved to be useful is the different probability distributions. This was significantly important because different probability distributions reduce bias in complex systems, which plays an important role in learning that complex systems operate normally.

Week 6 Reflection

**What have I learnt this week?** This week I learnt about mainly how complex systems evolve. The different complex systems that were explored and learnt in this workshop include Markov models, Random walk models as well as broadcast, diffusion, and contagion models.

**What do I 'now know' that I did not before?** Now I know what the definition of Markov Models, Random Walk Models as well as broadcast, diffusion, and contagion models. I know now all of these models links to the evolution of complex system models. A Markov Model is a model that is used to model systems that randomly change. I now know that Random Walk Models are models where in it assumes that a certain variable takes a random independent movement away from the previous value. I now know that broadcast models are models that express different ideas or information through different media such as the radio or television etc.

**What insights have I gained?** One of the major insights I have gained is these models can be used to real world scenarios. For example Markov models can be used to suggest probabilities of alert vs bored students and an example of Random Walk models is whether a monkey can do just as well in the stock market as a technical analyst? An example of broadcast models is a television channel that shows a Prime Minister presenting a speech on television.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of the perceived strengths that I observed is I understood broadcasting models well. This was a perceived strength because just like many people in the world, I watch television where different shows are broadcasted on it.

In terms of the modelling group assignment, one of the strengths that I have observed is the ideas that were collected for our topic which is COVID-19, were very good. This is mainly because our group had good communication and teamwork skills.

One of the weaknesses that I observed during the workshop is understanding the significance and meaning of Random Walk Models. This is because I haven’t learnt about random walk models and is a new concept.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above one of the major challenges that I encountered is understanding Random Walk Models. Understanding random walk models was handled well although it did take some time to completely understand the models. Random Walk Models took the longest time to completely understand in comparison to all models throughout the course so far. I handled the situation by doing extensive research.

**What would I do better next time and with what anticipated results?** One of the things that I could have done better next time to understand Random Walk Models is to do research before the Workshop started. This would allow myself to understand Random Walk Models better but also make myself learn Random Walk Models is a quicker time.

**What theory proved to be useful and why? What have I learnt from this?** The theory that proved to be the most useful is understanding the benefits of each of the models. By understanding the benefits of each model has allowed me to learn its significance in the evolution of complex systems. For example I have learnt that the benefit of Markov models is its flexibility as it can be applied to many situations.

The other bit of theory that proved to be useful is the examples that are given with each of the models. This bit of theory is important as it allowed myself to gain a better insight into the effectiveness and the use of the models that were studied in this workshop.

Week 7 Reflection

**What have I learnt this week?** This week I learnt about three different types of emergent behaviours. These types of emergent behaviours include peer effects and social contagion, coordination and culture as well as social learning. I also learnt about six different models which are Schelling’s Segregation Model, Granovetter’s Riot Model, Standing Ovation Model, Pure Coordination Games, Axelrod’s culture model as well as replicator dynamics models.

**What do I 'now know' that I did not before?** Now I know how all models that have been discussed in class portray information about cultures. I also now know the functions of all models and what the main information that the model is trying to explain. For example what I have learnt know is that the function of the pure coordination games model is to delineate the why people of different races, genders, regions etc. are dissimilar. I also now know that Axelrod’s culture model demonstrates the relationship between socialism and culture, such that culture progresses through the behaviour of individuals.

**What insights have I gained?** One of the main insights that I have gained is all these models that have been discussed within this workshop elucidate the vast differences between cultures of the world etc.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of the strengths that I observed was I observed Fisher’s Theorem and the Replicator Equation. This is a strength because I have a strong interest in Mathematics so the mathematical theory behind Fisher’s Theorem and the Replicator Equation made sense to me. Another strength that I observed was in terms of the modelling assignment, our group assigned roles and each one of them obliged to the specified role well. This was mainly due to great understanding and communication skills within our group. One of the weaknesses that I observed in my learning was fully understanding Schelling’s Segregation Model and its link to how things spread.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above one of the main challenges that I have observed is understanding the Schelling’s Segregation Model. This was potentially the case because this agent model was completely new to the other agent models that I have studied during the course already.

**What would I do better next time and with what anticipated results?** One of the things that I could have done better next time to understand Schelling’s Segregation Model fully is to do research before the Workshop started. This would not only allow myself to understand Schelling’s Segregation Model but also make myself learn Random Walk Models is a quicker time.

**What theory proved to be useful and why? What have I learnt from this?** One bit of theory that proved to be the most useful is Axelrod’s Culture Model. This is because Axelrod’s Culture Model was the most real world applicant model in terms of the other models that were learnt. One of the most important things that was learnt from this model is the ideology that culture will be repeated through the help of different individual’s behaviour.

Another theory that proved to be useful is understanding replicator dynamics. This theory was useful because it delineated that it is not beneficial for social purposes but can be used for psychological, economics and ecological purposes, hence showing the multi benefits of the system. I learnt that you have to analyse probabilities in order to make a decision on what option to choose. This was helped by the Replicator Equation.

Week 8 Reflection

**What have I learnt this week?** This week I learnt about game theory and how models can be applied to this topic. For game theory I learnt two models, one for strategy and one for cooperation. The model that was learnt for game theory strategy is the Colonel Blotto Game, whereas the model that was used for cooperation is the Prisoner’s Dilemma model.

**What do I 'now know' that I did not before?** I now know what a Colonel Blotto Game is and what a Prisoner’s Dilemma model is, models that I had not heard about before the tutorial started. A Colonel Blotto Game is a constantly summing game involving two players where each player has to try allocate finite resources over a large number of objects. I also now know that the prisoner’s dilemma is a game involving two players in which they can either cooperate or defect. Each person will get different payoffs according to the option that the players choose.

**What insights have I gained?** One of the main insights that I have gained is that both Colonel Blotto Game are very applicable to the real world and can be used in some important events in our world. For example Blotto Game can be applied to sports and hiring employees whereas Prisoner’s Dilemma can be used in technological adoption and political campaigns.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of the perceived strengths that I found out was I understood the real world applications of the Colonel Blotto Game and the Prisoner’s Dilemma well. This is because the information about real world applications was explained well and links were thoroughly explicated.

A strength that I observed while completing the assignment is all the work for the GitHub pre submission of the assignment was submitted on time. All the group work was submitted on time mainly due to the whole group communicating well and sticking to the cut off points that were set.

A weakness that I have observed is that it took myself a while to understand the theory behind Colonel Blotto Game and Prisoner’s Dilemma Model. This is potentially because this was my first time learning about these models and usually when things are learnt for the first time it is difficult.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above the main challenge encountered was it took a while to understand the Blotto Game and the Prisoner’s Dilemma Model. I managed with not understanding these models at first very well as I did thorough research after the workshop ended to be able to understand the concept of these models.

**What would I do better next time and with what anticipated results?** What I could have done next time is to do some pre research about Blotto Game and Prisoner’s Dilemma Model as this will have helped myself to understand the model in a quicker time. It would have also saved myself from doing research after the workshop ended.

**What theory proved to be useful and why? What have I learnt from this?** The bit of theory that proved to be useful is the real world applications of the Blotto Game and Prisoner’s Dilemma Model as this allowed myself to understand the real benefits of these models and how it can have an impact on topics in the world.

Week 9 Reflection

**What have I learnt this week?** This week was spent as a group working on the GitHub assignment together. This week I learnt the basics of Python Code and also how different models can be used to prevent the spread of COVID 19.

**What do I 'now know' that I did not before?** One of the main things that I now know that I didn’t know before is I understand the fundamentals of Python Code. Before this week I didn’t understand Python Code and I only knew JavaScript code.

**What insights have I gained?** One of the main insights that I have gained is many models that have been covered in class such as Agent Based Models, Schelling’s Segregation Model and Riot Models can be used in order to prevent the spread of COVID 19.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of the perceived strengths is all the people turned up the tutorial group call. This helped our group to successfully allocate roles for the group assignment and allowed good communication to occur.

Another perceived strength that I have observed is the decision making skills within our groups were phenomenal. All decisions made in terms of allocation of roles for different parts of the assignment were based on the strengths of the individual. Also another good decision that was made was to create a target date to finish off our parts to the assignment. This is beneficial as it will mean that we don’t finish the assignment at the last minute and will give our group time to give constructive feedback on our individual parts.

One of the perceived weaknesses that I have observed is it took a while for myself to understand the fundamentals of Python coding. This is mainly because I have had no experience of Python code before so originally it was challenging.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above one of the main difficulties that I encountered was understanding Python code originally. This challenge was dealt with well as my group and myself asked Juan for help in understanding Python code in which he gave articles on Python code. Also I did extensive research to consolidate my understanding of Python code.

**What would I do better next time and with what anticipated results?** One of the things that I could have done better next time is I could have done research about Python code before the workshop started. This would have meant that I would have entered this week better prepared and understood Python code better.

**What theory proved to be useful and why? What have I learnt from this?** One bit of theory that proved to be useful is understanding the Python code. This theory was the most useful theory as it is the most real life applicable to my desired future profession. The career I want to pursue is Business Analytics and I have learnt that Python coding is fundamentally important as it is used in the profession.

Week 10 Reflection

**What have I learnt this week?** This week was spent working on the GitHub group assignment. This week I learnt about how the models of Agent Based Models, Schelling’s Segregation Model and Riot Models can stop the spread of COVID 19.

**What do I 'now know' that I did not before?** The thing that I know now that I didn’t know before is how Agent Based Models, Schelling’s Segregation Model and Riot Models can be used in order to prevent the spread of COVID 19.

**What insights have I gained?** One of the main insights that I gained is COVID 19 can spread through many different surfaces.

**What are (my/the) perceived strengths and weaknesses that I have observed?** One of the perceived strengths of the group was there were excellent communication skills amongst the group. Each member of the group used social media platforms to inform team members whether they have completed parts of the assignment or required any assistance. Additionally all information provided by our groups team members was very clear.

One of my perceived weaknesses is implementing the Python code was a bit difficult in order to explain the models. This was difficult because usually explaining the different models is done by words, so this was a challenge to express it in Python code.

**What were the challenges I have encountered/observed and how well (did I/my team) handle them?** As mentioned above one of the challenges that I encountered was expressing the explanation of the different models to prevent the spread of COVID 19 in Python Code. This was handled with well as Juan’s resources were very beneficial in explaining Python code.

**What would I do better next time and with what anticipated results?** One of the things that I should do next time is I should have done some pre reading before I attempted to do the Python coding as this would have helped me to understand the code better.

**What theory proved to be useful and why? What have I learnt from this?** The theory that proved to be useful is learning Agent Based Models, Schelling’s Segregation Model and Riot Models in more depth. This theory was useful because it was very useful to the real world. I have learnt how these models can stop the spread of COVID 19.