Workshop on World Modeling/Workshop on Methods of Human Security Studies

Lecture One:　What is Multi-Agent Simulation?

<u>What can it do?</u>
・　Forest Fire Model

→ Premise: Fire spreads to neighboring areas. Given a forest of a certain density, how will it spread? The rule is simple. Trees are randomly located in this space. Let's see how it spreads when the fire starts in a certain location. Though it is not available in this version, innumerable possibilities of use can be contemplated. A change in wind direction, what will that change?　What if the trees are very flammable? What if there are roads?

・Life Game Model

→　Premise: Surrounded by two to three reds, you will be red; otherwise white. In total, what nature of order will evolve out of this?

・Segregation Model

→ Premise: You will have to move unless there are more than a certain number of individual agents with the same color as you. What becomes of the relationship between the level of satisfaction of individuals involved and the state of progress of segregation at large. One illustration is black and white people ─　Irony ; Reality may turn out to be just the opposite of the intent.

・Wolf and Sheep Model

→ Being the predator and the prey, attention is on the curve created by the change in number of wolves and sheep. Because wolves eat sheep: if the head count of sheep decreases─so do wolves; if head count of wolves decreases ─ sheep will increase; if the flock of sheep increase ─ wolves will increase. The number will fluctuate.

・Traffic Jam Model

→ Bumper-to-bumper." I'd like to get hold of the driver in the front!! Wait?
Where is the front?"
Rule: Slow down if you are tailgating.

Even if the cause of a traffic jam is resolved, it will linger on to have an effect on the rear traffic.

・Amusement Park Model
→ The more people check on information about congestion at parks, the less the waiting time. Is that true?

・ Bunched Up Bus Model
→ Long wait for a bus－eventually two busses drive in at once.

・Transformation of Culture Model
→ How can culture be expressed? For instance by two-digit tag・・・00,01,10,11

・Power Struggle Model
→ What will happen if nations repeat war and alliance?

・Sudan Conflict Model
→ Mobilization of forces － Conclusion of Conflict

How is it made?
・Bird Model

Conclusion: What is Multi-Agent Simulation?
・Model and Multi-Agent Simulation