Workshop on World Modeling・Workshop on Methods of Human Security Studies
2005　Summer Semester

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Lecture Two: Get a Feel of KK-MAS! (April 26th)

●MENU

○Let's try installing! (Can you do it?).［Self-introduction？］
○Introducing the Segregation Model and the Prisoner's Dilemma PD Model.
○Let's play with the two models.
○Introducing the brand-new, fresh- from -the-oven model: the Cuban Crisis Model.

●Download and Install

First of all, download the necessary files from HP on Java KK-MAS Community（http://www.kke.co.jp/iit/mas/index.html）and install Java version KK-MAS.
Mac-OS version,sample models,Help manual: Make sure to download these.
Also download today's lecture; both text and model.

●The Segregation Model

○Concept of the Model

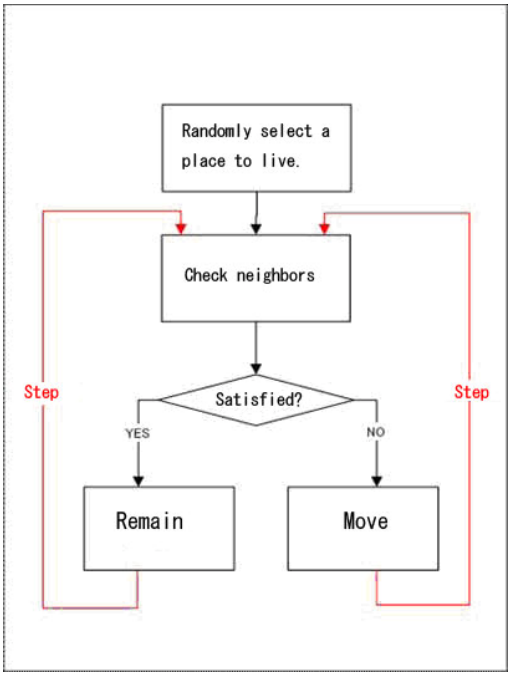
Two categories of inhabitants exist: To certain degree, inhabitants tend to prefer to live close to the same category of people. What would happen if such people all did live in one city?

○Casting the Performers［Tree］［Universe］［Space］［Red Turtle and Blue Turtle］［Variables］

○Concept of the Rule　　［What the Turtle is Thinking］

（１）Which type of turtles live around me?
（２）Of them all, how many are my fellow turtles?
（３）Satisfied?　Unsatisfied?
（４）We must move if we are unsatisfied.
（５）And now, which turtles live around me?

○Concept of the Rule: Flow chart



○Rule（[excerpt]）

```
MakeOneAgtSetAroundOwnCell(surrounding red turtle, 1,
   Universe. two dimensional space. red turtle, false)
Number of red turtles = CountAgtSet(surrounding red turtles)
MakeAllAgtSetAroundOwnCell(surrounding red turtle, 1 , false)
Turtles total = CountAgtSet(surrounding turtles )

If number of red turtles > 0 Then
  My.happiness = number of red turtles / turtles total
Else
   My.happiness = 0
End If

If My.happiness < Universe.level of satisfaction Then
   MoveToSpaceOwnCell( 3 )
Else
   Universe.happy turtle = Universe.happy turtle + 1
End If
```

Are there red turtles here?

How many turtles in total live in the vicinity?

Of the surrounding turtles, how many are red (fellow turtles)?

Are you satisfied?
If not, we'll move.

☆☆☆Let's try －Look carefully ［execute］［graph output］

－Play with the parameters［level of satisfaction］［number of turtles］

☆☆☆Agenda A ：Analyze !

How will the system work if the parameters are varied ?

Altering the settings, lets analyze.（mttj_19@yahoo.co.jp）

●The Prisoner's Dilemma PD Model

○Concept of Model

Six prisoners are repeatedly playing the 「**Prisoner's Dilemma**」 **Game, competing for higher scores**. Which strategy will win them a better score?

		opponent	
		believe(C)	betray(D)
player	believe(C)	1 / 1	2 / -1
	betray(D)	-1 / 2	0 / 0

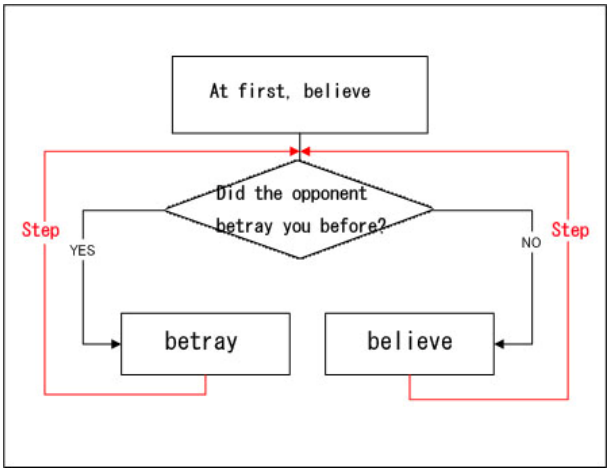
Prisoner's Dilemma :

Prisoner has a choice of "believe" or "betray."

The rule of the game: If you believe in each other, this is a score. If you betray your opponent, who believes in you that is high score. On the contrary, being betrayed by an opponent you believed in, is minus point. Mutual betrayal is considered as no effect. This is a super famous game, illustrating a social dilemma.

○Casting the Performers ［Tree］［Universe］［Space］［Prisoner］［Variables（Strategy）］

○Concept of the Rule ［What the Prisoner is Thinking （tit-for-tat TFT）］



☆☆☆Play around with it!　　［execution］［graph output］

☆☆☆Assortment of Strategies

☆Tit-for-tat（TFT）

☆Friedman

The player will continue to believe. But once the opponent betrays, the player will continue to betray till the dead end.

☆Joss

Once betrayed, the player will next betray. If not, he will believe 90 percent of the way.

☆Random

It is always a 50/50 chance. May betray or may believe.

（☆）AllC

Always believes

（☆）AllD

Always betrays

☆☆☆Agenda B : Analyze !

Is the traditional TFT a true strong strategy?

Will a change in combination of strategies change the result?

The secret behind the strength of TFT（mttj_19@yahoo.co.jp）

●History of Models

○The Segregation Model

Thomas Schelling (1978) Micromotives and Macrobehavior, pp 488-493.（original report, 1969）The experiment with a chess board, coins and dice.

○The Prisoner's Dilemma Strategy Contest Model

Robert Axelrod(1984)Evolution of Cooperation.（In Japanese;『Tsukiaikata no Kagaku』(Minerva Publishers)）Original report;1980.A computer contest was held with participants from different backgrounds; psychology, economy, politics, mathematics and sociology. Fourteen participated in the first contest and sixty-two in the second contest.

●Now let me introduce the Cuban Crisis Model!