IFN501 - System Modeling and Simulation

Session 3: Introduction to Computer Simulation (Part 2)

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Outline

Acknowledgement

When not specifically defined, the contents of this presentation are adapted from [1].

Outline

Different Types of Simulation

- Continuous

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- Monte Carlo

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- Discrete Event

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- Agent-based Modeling

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  - Competition between 2 populations
  - Population and/or urban growth

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- Example: paintball game between two groups

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  - The duration of each event can be different e.g follows certain distribution pattern (See Tables 1 and 2)

Different Types of Simulation

Discrete Event Computer Simulation – Example

Table 1 : Time between customer arrivals

Time (min.)	Percentage (%)	Time (min.)	Percentage (%)
1	5	6	20
2	7	7	10
3	8	8	8
4	10	9	7
5	20	10	5

Table 2 : Service durations

Time (min.)	Percentage (%)	Time (min.)	Percentage (%)
1	10	4	25
2	25	5	10
3	30		

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  - The machine was used 10898 times by 10898 customers
- The results can be used for evaluation and to determine if another machine is needed.

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  - Adaptive behaviors or learning
  - Interaction rules or topology
  - Environment for interaction often consisting of constrained resources

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References I

[1] R. McHaney, Understanding Computer Simulation. Ventus Publishing, 2009.