Opening Panel:

What to use: Simulation Packages, Simulation Languages or General Purpose Programming Languages?

(Organized by: Prof. M. Obaidat)

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http://www.site.uottawa/~oren/y/2019/07-29_Prague-panel.ppsx
“So far as users are concerned, the aim of computerization is not necessarily to develop software but to solve problems with the assistance of computers. Therefore, the software industry would serve the users better by providing Computer-Aided Problem Solving (CAPS) environments.”


Maintenance of specifications has advantages over maintenance of codes.
Simulation theory/methodology provides a systematic structure for simulation specifications.  


A structured approach in computerization is preferable over an unstructured approach.

Some facts about simulation and computerization
(For a decision based on facts)
Figure 1 - Relationships of basic concepts in simulation and in real-world experimentation
Types of **inputs** in simulation:

- Externally generated (exogenous)
- Internally generated (endogenous)

**Perception of inputs from a richer perspective allows conception of all types of model couplings.**

Table 3: Types of sensations (Adopted from Ören and Yilmaz, 2004)

<table>
<thead>
<tr>
<th>Type of stimulus</th>
<th>Type of perception</th>
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<tbody>
<tr>
<td>light</td>
<td>- <strong>vision</strong> (visual perception): visible light vision, ultraviolet vision, infrared vision</td>
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<tr>
<td>sound</td>
<td>- <strong>hearing</strong> (auditory sensing): audible / infrasonic / ultrasonic sound (medical ultrasonography, fathometry, sonar)</td>
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<tr>
<td>chemical</td>
<td>- (gas sensing / detection): smell (smoke / CO2 / humidity sensor)</td>
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<td></td>
<td>- (solid, fluid sensing): taste, microanalysis</td>
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<tr>
<td>heat</td>
<td>- <strong>heat</strong> sensing</td>
</tr>
<tr>
<td>magnetism</td>
<td>- <strong>magnetism</strong> sensing: geomagnetism / thermo-magnetism</td>
</tr>
<tr>
<td></td>
<td>sensing, electrical field sensing</td>
</tr>
<tr>
<td>touch</td>
<td>- sensing <strong>surface characteristics</strong></td>
</tr>
<tr>
<td>motion</td>
<td>- <strong>acceleration</strong> sensing</td>
</tr>
<tr>
<td>vibration</td>
<td>- <strong>vibration</strong> sensing: seismic sensor</td>
</tr>
</tbody>
</table>

SIMULTECH’15, Colmar, France
July 21-23, 2015

Awareness-based Couplings of Intelligent Agents and Other Advanced Coupling Concepts for M&S

http://www.site.uottawa.ca/~oren/y/2015/D04_couplings-pres.ppsx
Some facts about simulation and computerization (For a decision based on facts)

6 main components of a simulation program:

- Model
- Experimental conditions (experimental frame)
- Behavior generator
- Model
- Experimental conditions (experimental frame)
- Behavior generator
Simulation Packages and Simulation Languages
• can embed components of simulation systems
• and would not require to have them implemented for every study
• hence have advantages over general purpose languages.

However, if you realize that some structural features are not available in simulation packages or simulation languages:
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1. You are lucky, since innovations are based on non-met requirements.
2. No progress is ever possible by keeping the status quo.
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However, **if you realize** that some structural features are **not available** in simulation packages or simulation languages:

1. You are lucky, since **innovations are based on non-met requirements**.
2. **No progress** is ever possible by keeping the status quo.
3. Consider the words of the Carthaginian general **Hannibal Barca** (247-183 BCE):
   “I shall find a way or make one.” (“Inveniam viam aut faciam.”)
   (A motto fit also for researchers.)