Between the Boxes: Rensselaer Efforts

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Panel Questions

- **What external systems?**

- **How was it done?**
  - ◆ Network Traffic?
  - ◆ Info sent and received?

- **What worked, and what didn't?**

- **Time synchronization?**

What External Systems? *Where we are going*

- **Scaled World for Intelligence Analysts**
  - ◆ **Game-like look&feel as per SimCity™, WarCraft™, etc**

- **Separate machine required to implement simBorg (black-box module for this project uses AI-based Formal Logic System that is resource intensive)**

- **GUI-interface developed by Planet 9 Studios to use advanced 3D, multimedia, innovative features**

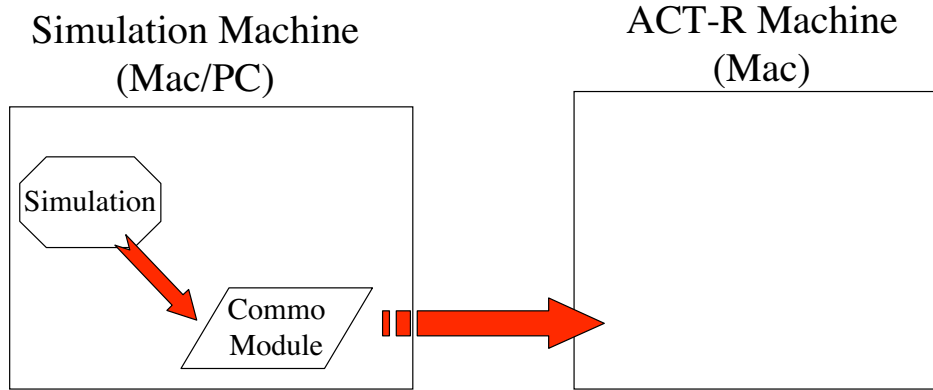- **Purpose of the model is to provide simulated user for automated usability testing**

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What External Systems? *How we are getting there*

- **Mac-to-Mac in MCL (proof-of-concept)**
  - ◆ **Argus Prime simulation & model**
  - ◆ **We built both**

- **Mac-to-PC (toy system)**
  - ◆ **ACT-R in MCL**
  - ◆ **Simulation in C++ under windows**
  - ◆ **We built both**

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How Was It Done?

Simulation Machine (Mac/PC)

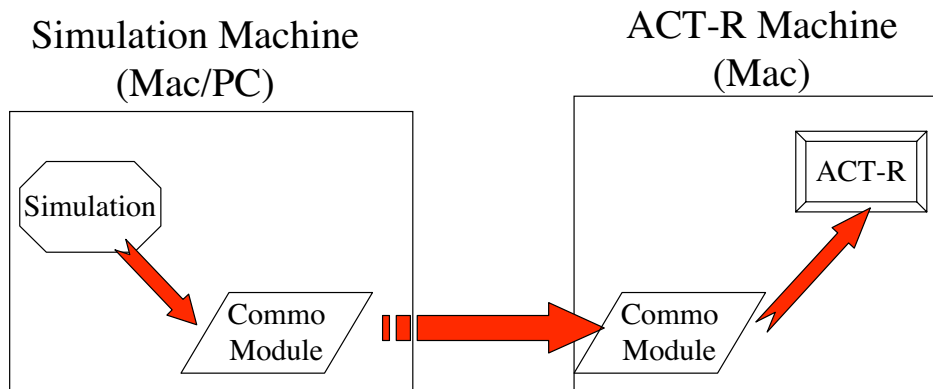Simulation

Commo Module

ACT-R Machine (Mac)

■ Simulation

◆ Sends text descriptions of GUI objects to Commo Module

■ Commo Module

◆ Sends feature descriptions & mouse/cursor positions over TCP/IP (text strings) to ACT-R machine
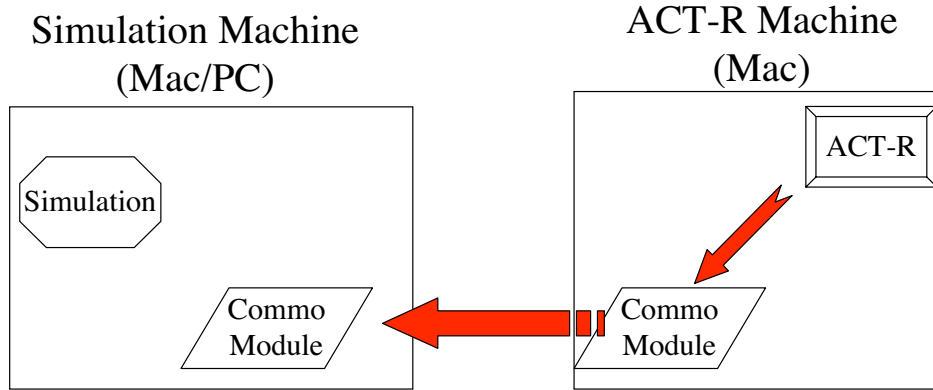

How Was It Done?

Simulation Machine (Mac/PC)

Simulation

Commo Module

ACT-R Machine (Mac)

ACT-R

Commo Module

■ Commo Module(Mac machine)

◆ Instantiates features

◆ Updates visual memory

■ ACT-R cranks on

How Was It Done?

Simulation Machine (Mac/PC)

Simulation

Commo Module

ACT-R Machine (Mac)

ACT-R

Commo Module

- ◼ ACT-R
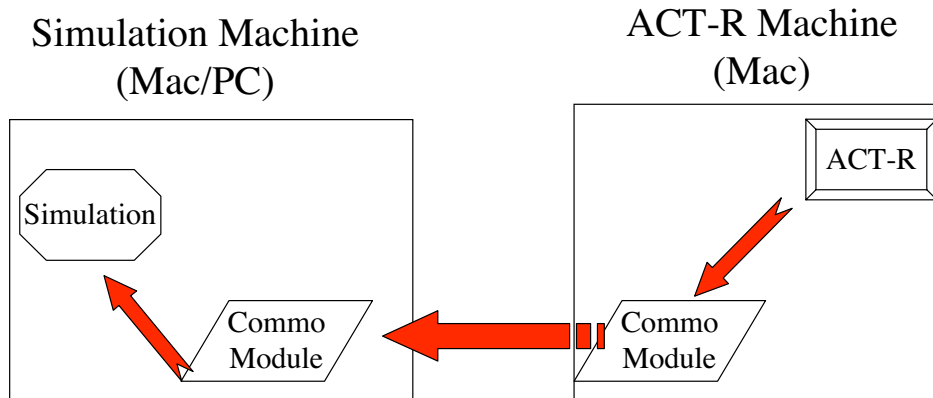 - ◆ RPM functions redefined to send messages to Commo Module

- ◼ Commo Module
  - ◆ Sends commands to Simulation Machine over TCP/IP

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How Was It Done?

Simulation Machine (Mac/PC)

Simulation

Commo Module

ACT-R Machine (Mac)

ACT-R

Commo Module

- ◼ Commo Module (simulation machine)
  - ◆ Makes OS call to execute RPM commands

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What worked, and what didn't?

- **Mac-to-Mac**
  - ◆ **Model was more intertwined with simulation than modeler had realized**
  - ◆ **Separating the two helps to keep the modeler honest!**

- **Mac-to-PC**
  - ◆ **Line endings!!**
  - ◆ **Finding common ground with the developer**
  - ◆ **Currently in-progress!**

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Time synchronization?

- **We avoid many problems with time synchronization because our simulations run in real-time -- hence we can use the real-time mode of ACT-R**

- **Running on separate machines avoids conflict of resources that would lead to timing issues**
  - ◆ **No degradation of resources due to simulation -- makes it easier for ACT-R to keep up with a dynamic simulation in real-time**
  - ◆ **Prevents ACT-R from locking out other processes**

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