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
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
**How Was It Done?**

- **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)

- Commo Module

- Instantiates features

- Updates visual memory

ACT-R Machine (Mac)

- ACT-R cranks on

- Commo Module (Mac machine)
How Was It Done?

- **ACT-R**
  - RPM functions redefined to send messages to Commo Module

- **Commo Module**
  - Sends commands to Simulation Machine over TCP/IP
How Was It Done?

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