**Between the Boxes: Rensselaer Efforts**

Michael J. Schoelles  
Christopher Kotfila  
Wayne D. Gray

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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 Machine (Mac/PC) 
- 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

ACT-R Machine (Mac)

**How Was It Done?**

Simulation Machine (Mac/PC) 
- 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
- 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 (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