The Project

- Computer user security
- Focusing on user aspect (over infrastructure) in a corporate environment
- Simulating different factors that affect a company’s security
Selected threats

- E-mail
  - Viruses
  - Spear-phishing
- Traveling laptops
  - Hostile/fake access points
- Social engineering
- Spyware
Möbius

- Modeling software for computer and network system
- Framework:
  - Atomic model
  - Reward model
  - (Composed model)
  - Solved model
Möbius - Atomic model

- Activities
- Input gates
- Output gates
- Places
  - Tokens and marking
Example: Threats from virus-infected laptops

**Input gate:** contains conditions to de/activate activity

**Place:** Value denoted by: totalCarriers->Mark()

**Activity:** Has firing rate and case probabilities (e.g. probVirusScan)

**Output gate:** increments number of tokens in connected place
CorporateUserSecurity: PortableDeviceStudy

Study: PortableDeviceStudy
Reward Model: PortableDeviceMeasurement
3 Active of 3 Total Experiments

Change Reward Model
Experiment Activator

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Type</th>
<th>Variable Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>probDataEncrypted</td>
<td>double</td>
<td>0.53</td>
</tr>
<tr>
<td>probFakeAP</td>
<td>double</td>
<td>0.04167</td>
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<tr>
<td>probVirusScan</td>
<td>double</td>
<td>0.86</td>
</tr>
<tr>
<td>rateDataTransferred</td>
<td>double</td>
<td>0.9</td>
</tr>
<tr>
<td>rateInfectedLaptopReturn</td>
<td>double</td>
<td>0.00595</td>
</tr>
<tr>
<td>rateInternalInfection</td>
<td>double</td>
<td>Manual Range</td>
</tr>
<tr>
<td>rateLogOnWireless</td>
<td>double</td>
<td>0.125</td>
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</tbody>
</table>

Manual Range

Study: PortableDeviceStudy
Variable: rateInternalInfection
Type: double

New Value

Current Values:
0.01
0.5
1.0
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Study</td>
<td>PortableDeviceStudy</td>
</tr>
<tr>
<td>Simulation Type</td>
<td>Terminating Simulation</td>
</tr>
<tr>
<td>Run name</td>
<td>Results</td>
</tr>
<tr>
<td>Random Number Generator</td>
<td>Lagged Fibonacci</td>
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<tr>
<td>Random Number Seed</td>
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<tr>
<td>Maximum Batches</td>
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<tr>
<td>Minimum Batches</td>
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<td>Number of Batches per Data update</td>
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<tr>
<td>Number of Batches per Display update</td>
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<tr>
<td>Build Type</td>
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<td>Enable Mobius Trace</td>
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<tr>
<td>Enable XML Trace</td>
<td>No</td>
</tr>
<tr>
<td>Store simulator console output to file</td>
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<tr>
<td>Store observations to ASCII .csv file</td>
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</tr>
<tr>
<td>Store observations to binary .dat file</td>
<td>No</td>
</tr>
</tbody>
</table>

 Möbius Simulator 2.2.1
 Model PortableDeviceSim Version: 1
Number of computers infected vs Rate of internal infection
Marking dependent, 1 run, with limit

Number of computers infected vs Rate of internal infection
Marking dependent, 1 run, no limit
Number of computers infected vs Presence of effective virus scan
(single run simulated)

probVirusScan = 0.55  probVirusScan = 0.86  probVirusScan = 0.91
Number of computers infected vs Presence of effective virus scan
(1000 runs simulated)

- probVirusScan = 0.55
- probVirusScan = 0.86
- probVirusScan = 0.91
- Linear(probVirusScan = 0.86)
Number of infected computers vs Rate of internal infection

- Rate of internal infection = 0.01
- Rate of internal infection = 0.02
- Rate of internal infection = 0.10
Most memorable

- (In)compatibility problems!
- Research process
  - How to choose an area of interest
  - Benefits of browsing instead of Google-searching