Why simulate when you can experience?

G. Jourjon, T. Rakotoariveloa and M. Ott
NICTA, Australia
Existing ACM Computer Science Curriculum

“Mastery of this subject area involves both **theory** and **practice**. Learning experiences that involve **hands-on experimentation** and **analysis** are strongly recommended as they reinforce student understanding of concepts and their application to real-world problems.”

AM Computer Science Curriculum 2008
Net Centric Computing
hands-on experimentation

scale & complexity

The Art & Science of Experimentation
How “well” are the experts doing?

“Evaluation” section of SIGCOMM 2010 papers

- Missing Model Validation: 12% (4)
- Missing Experiment Description: 9% (3)
- Missing Replication Information: 21% (7)
- Missing Precision Information: 58% (19)
- OK: 30% (10)
The Art & Science of Experimentation

- The art of designing experiments
- Scientifically sound methodology & analysis
Our Approach

- A few Lego blocks with dials on them
  - Works out of the box – can play with dials
  - Can look inside blocks, replace them
OMF: Systematic Experimentation

- **Experiment Description**
- **Results**
- **Deploy & Configure**
  - **Control**
  - Orbit, Planetlab, Emulab
  - Measure
LabWiki: Systematic Investigations
Current State

• Used in 2010 Semester 2 at UNSW
  ▪ post/undergraduate courses with 137 students
  ▪ Around 9000 experiments ran in a month
• Student survey results published at ACM ITiCSE 2011
  • G. Jourjon, S. Kanhere, J. Ya, Impact of an e-learning platform on CSE lectures
Conclusion

• The Art & Science of Experimentation
  – The art of designing experiments
  – Scientifically sound methodology & analysis

• Learning
  – Reflection on the methodology
  – Developing Best Practices
  – Teaching experimentation at scale

• Tools
  – To streamline processes
  – To record processes and outcomes

http://omf.mytestbed.net