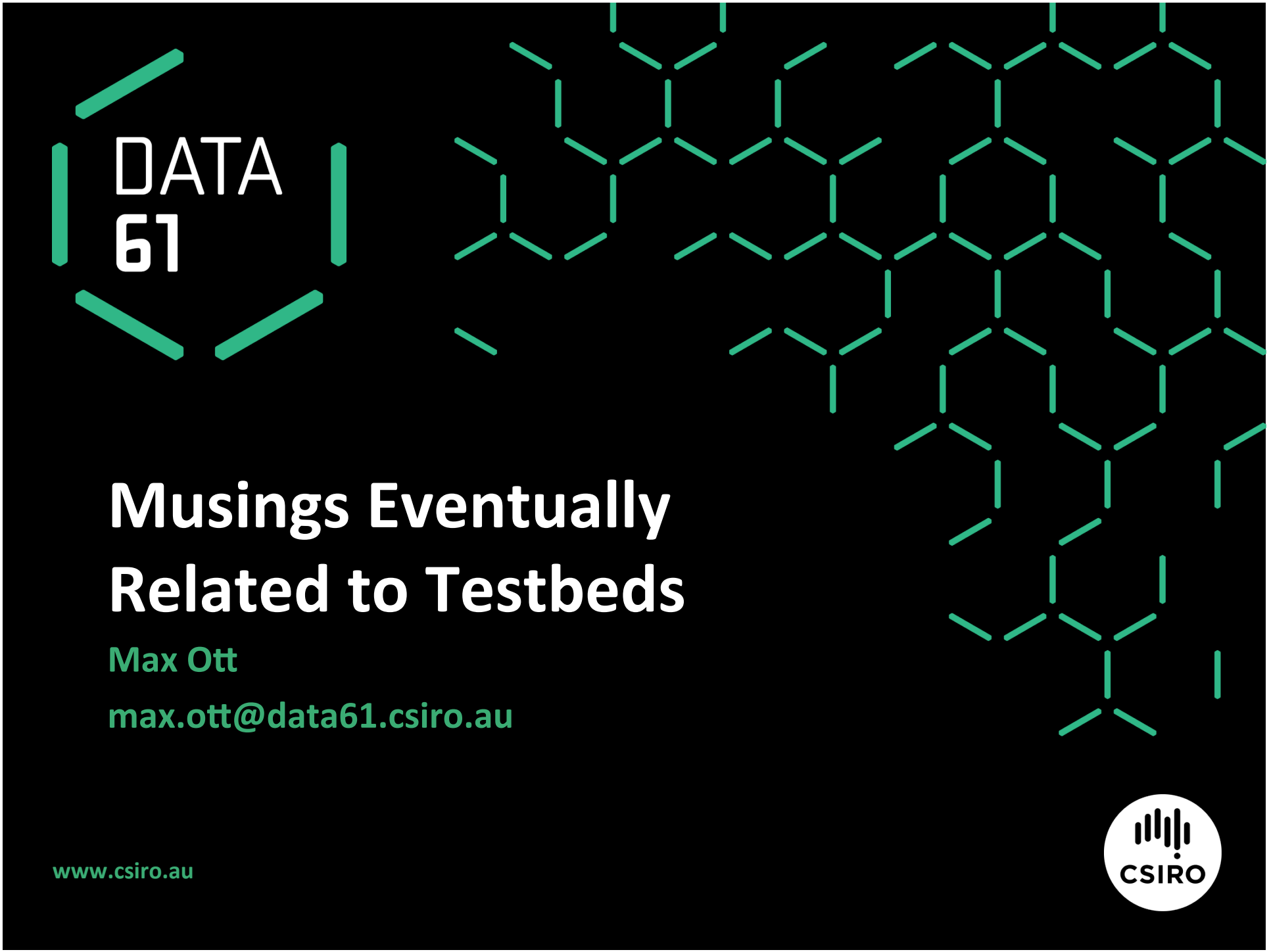

Musings Eventually Related to Testbeds

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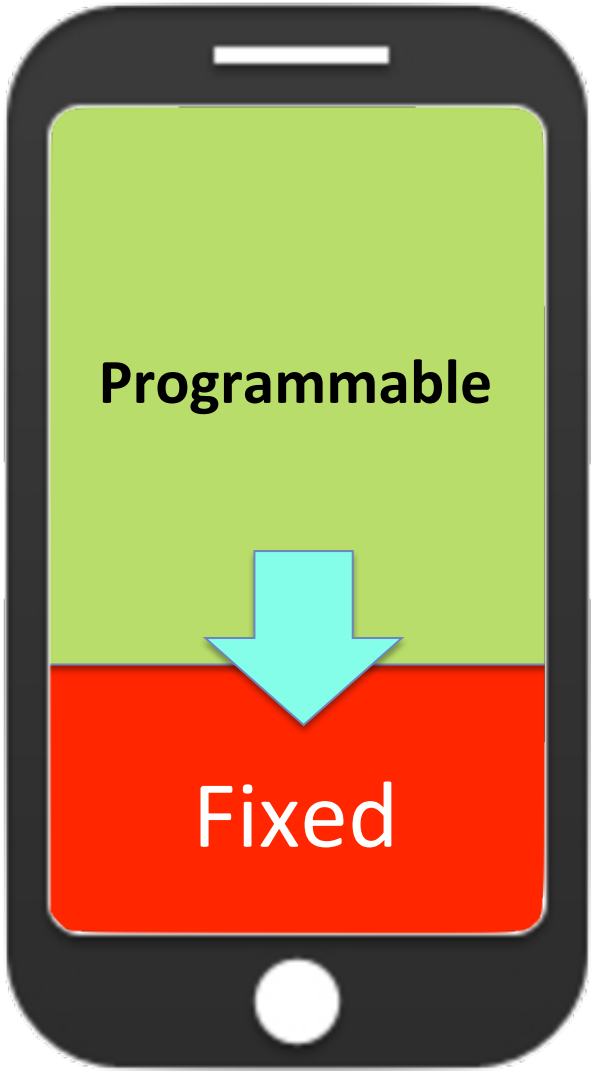
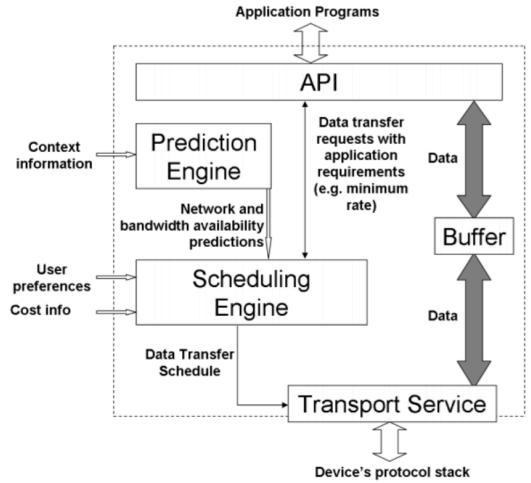
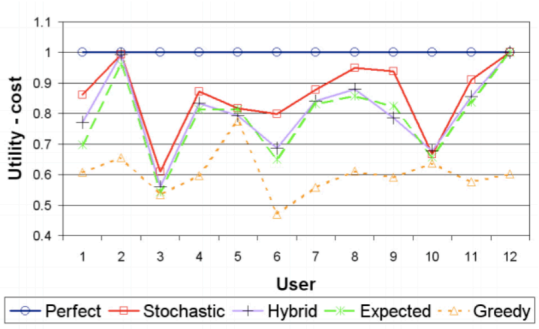
IMPACT!

~ 1 – 2 years


Search
Help
Games
Calendar
Maps
Contacts
Music
Internet
Camera

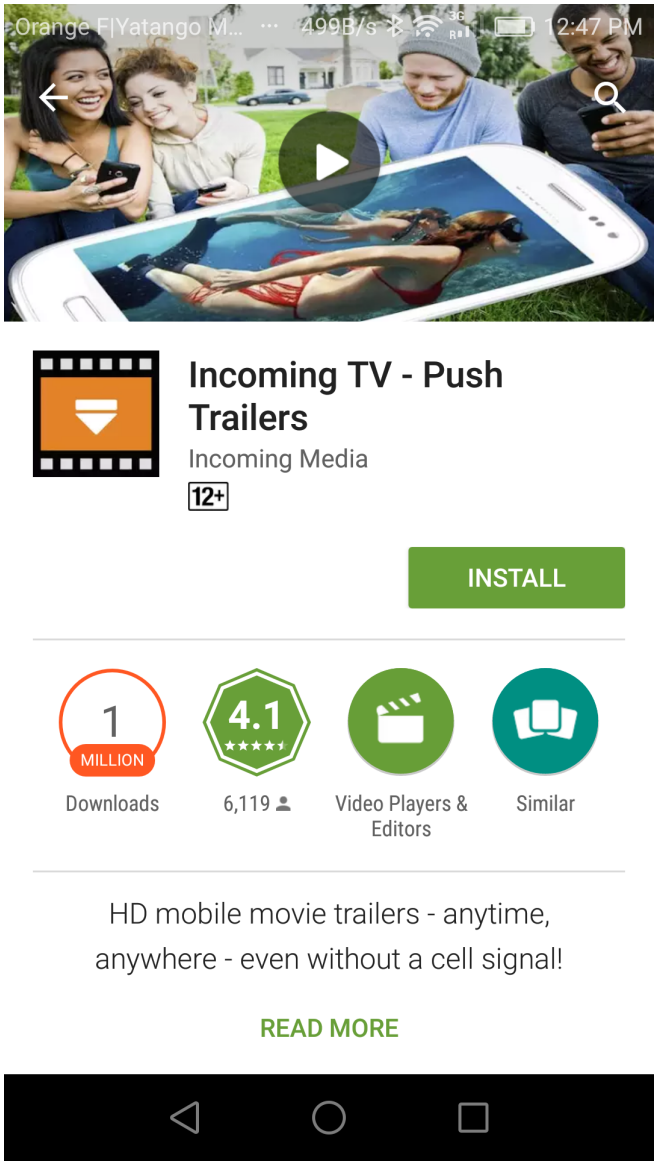

Programmable
Fixed



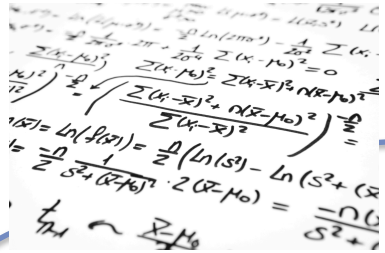


Rathnayake, U., Petander, H., Ott, M. et al. Mobile Netw Appl (2012) 17: 216. doi:10.1007/s11036-011-0332-4

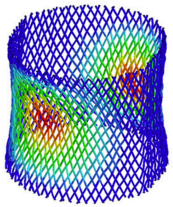
4 Citations



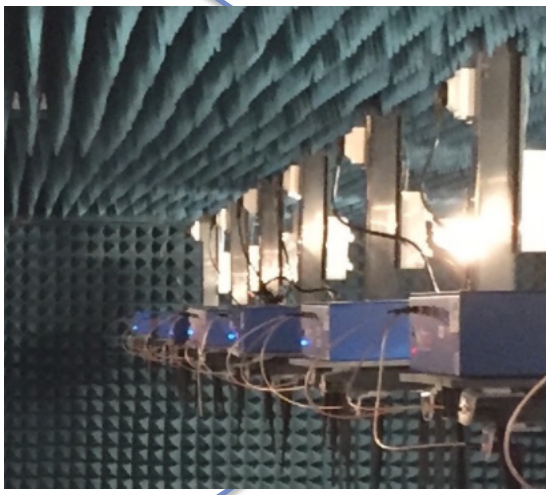
Theory



Simulation



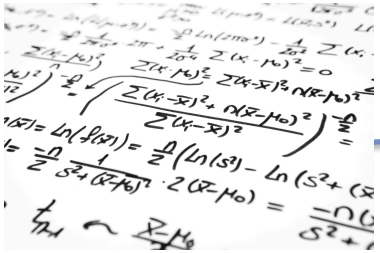
Idea

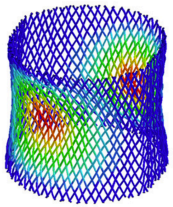


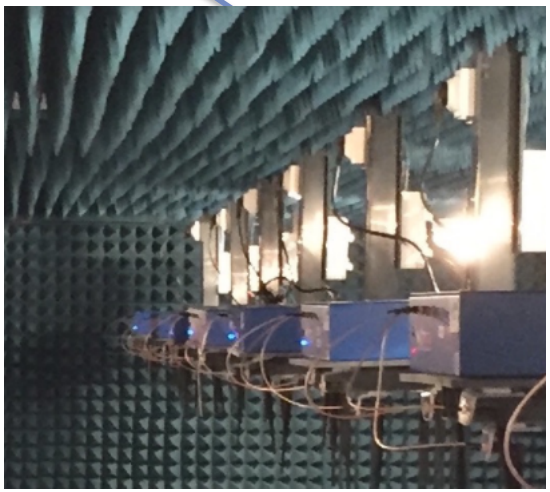
Testbeds

Standard

Product
Service

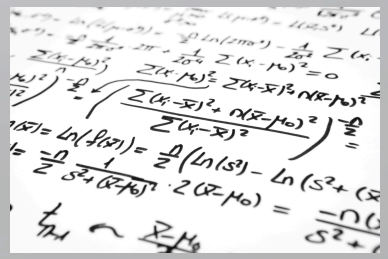


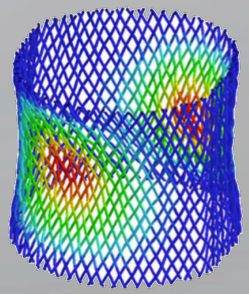


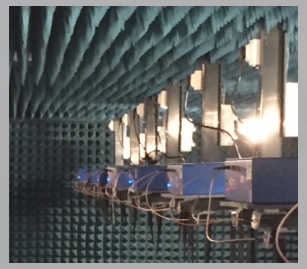


Holistic Explorations

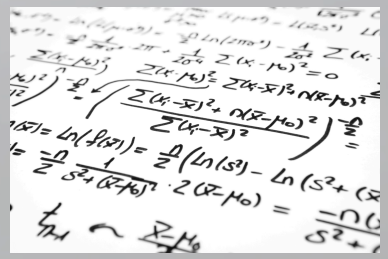
- Theory
  - + Provides bounds & feasibility
  - – Simplifying assumptions
- Simulation
  - + Scale & flexibility at attractive cost
  - – Simplified models (difficult trade-offs)
- Testbeds
  - + Realism
  - – Lack of scale / large cost

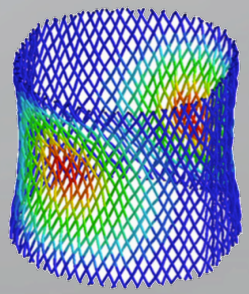


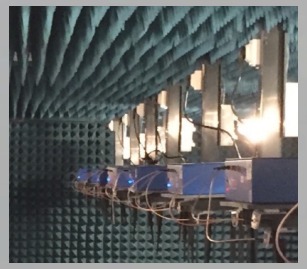




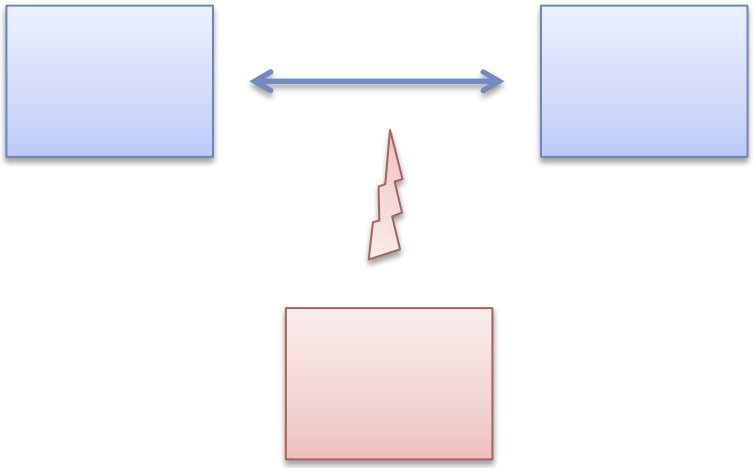
?








RISK



- Environment/Channel
- Traffic Characteristics
- Mobility
- Energy
- Use Case
- …

Optimisation Problem

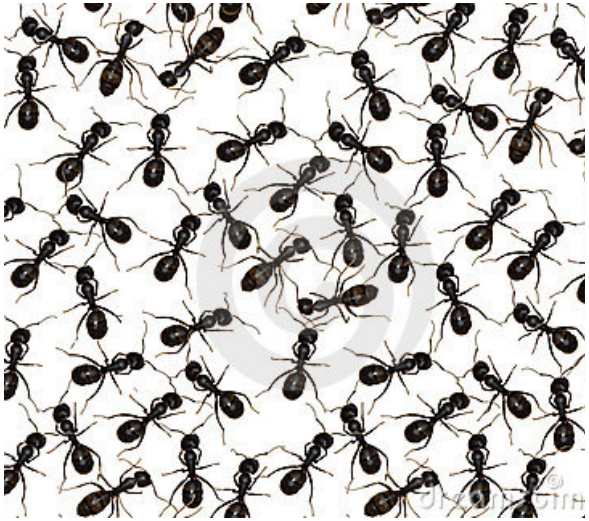
- What?
- How?
- …

Optimisation – What?

- Throughput
- Capacity
- Latency
- Energy
- Cost
- Reliability
- Robustness

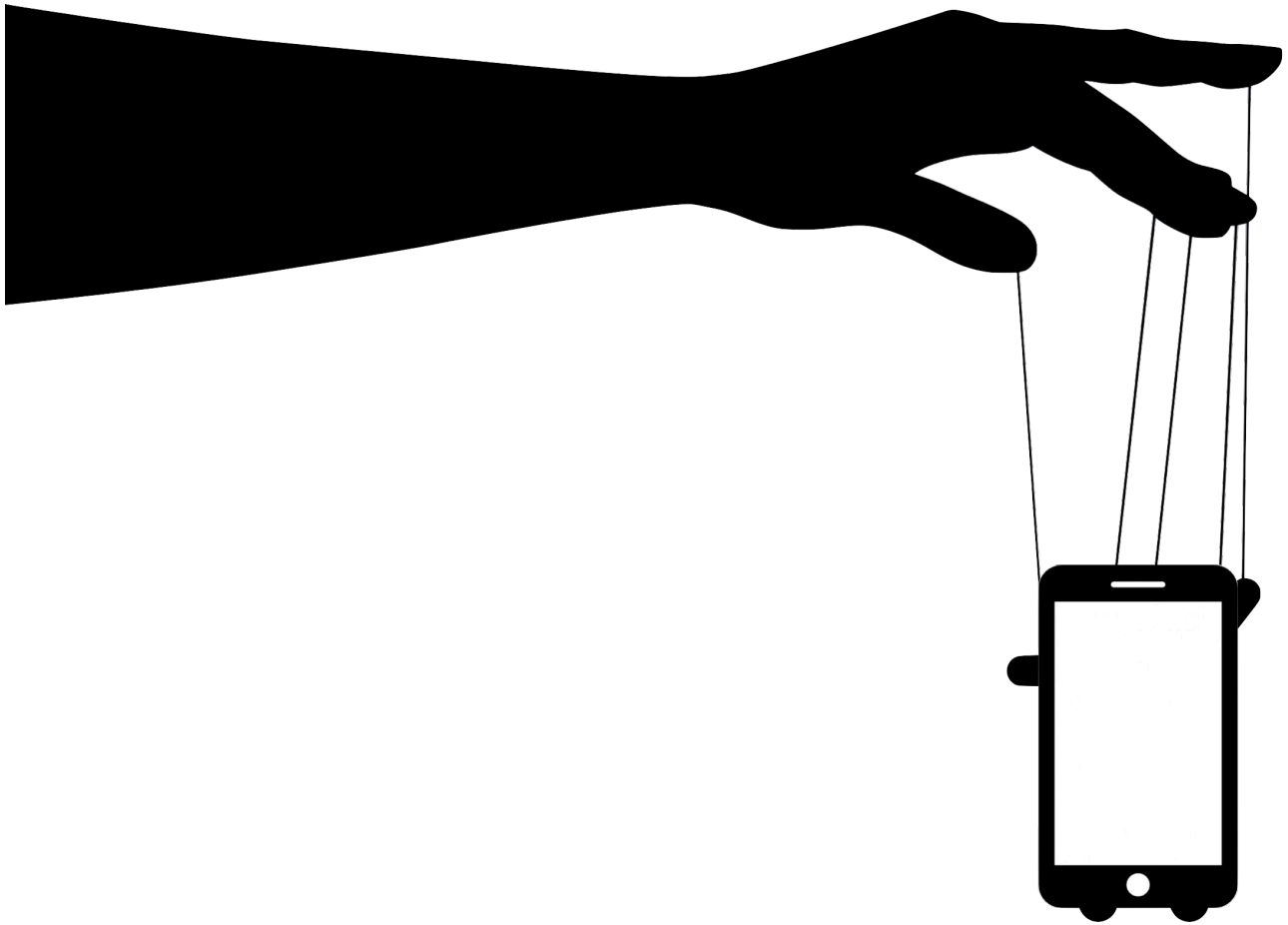
Optimisation – How?

Matrix



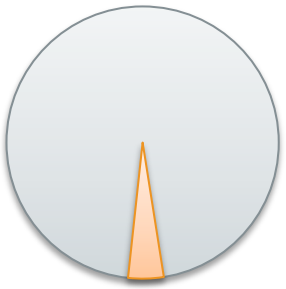
Ants

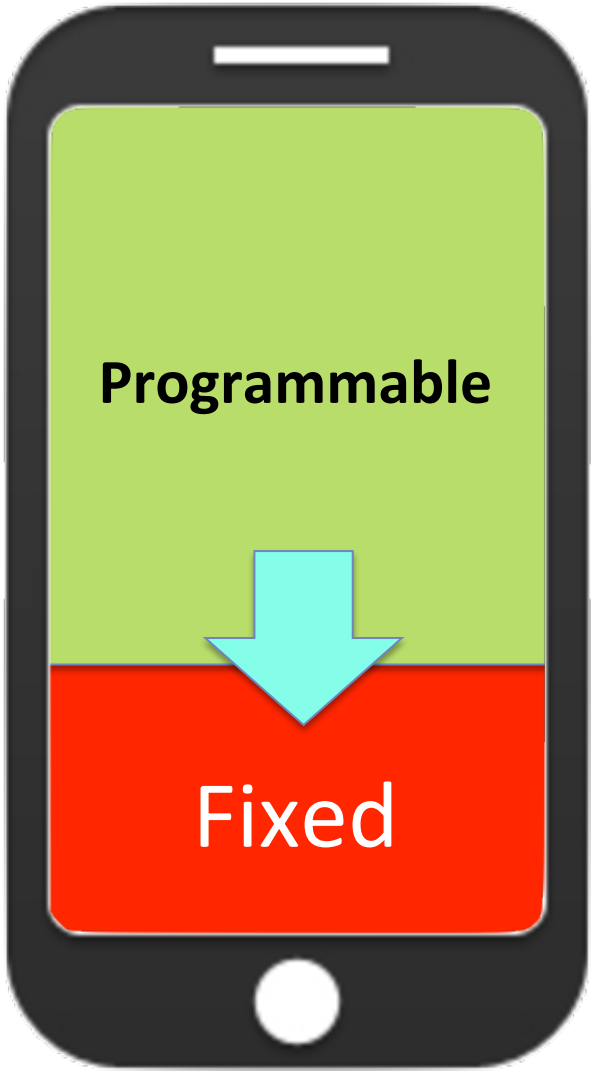
Today – Managed Services



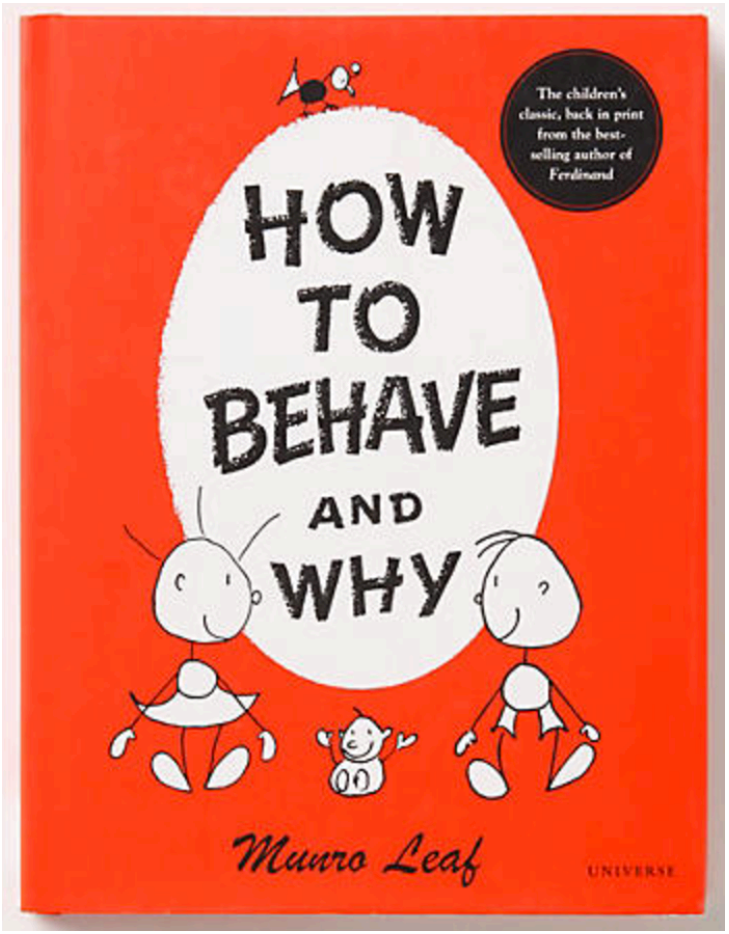
The World Has Changed …

Comms




Programmable
Fixed

… Maybe We Should, too

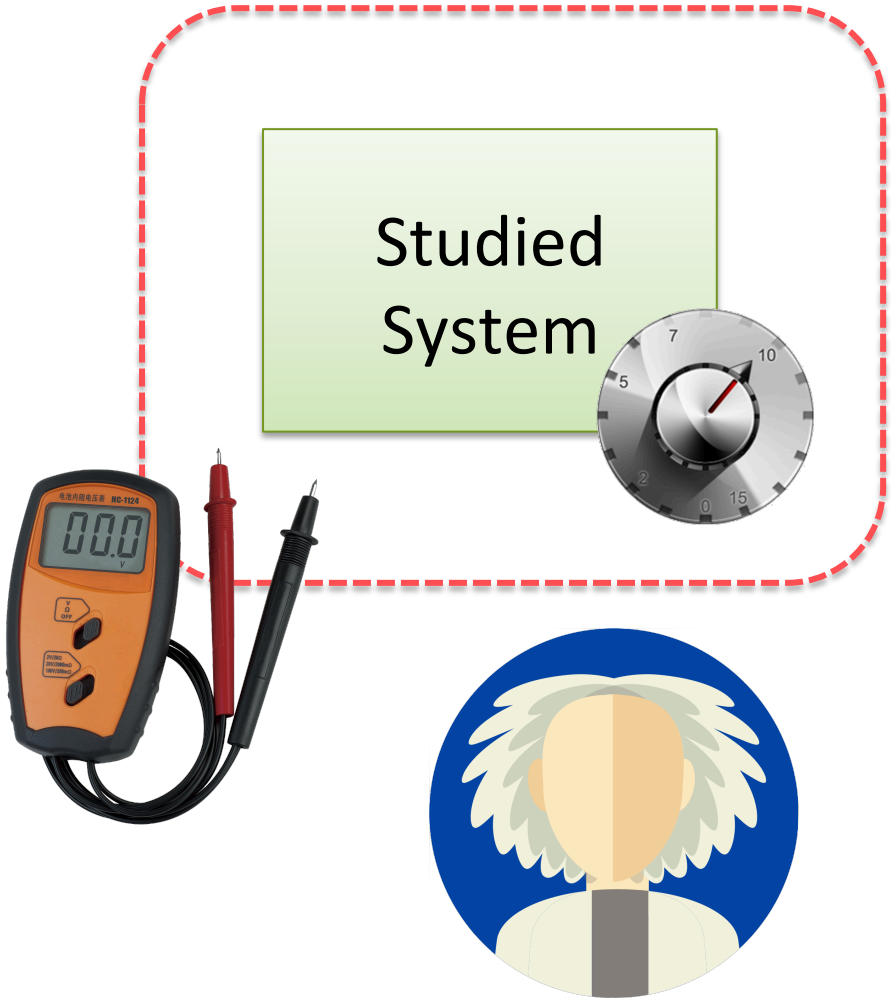


So what does that have to do with …

R2Lab:

A safe place for communication systems to learn how to become AWESOME systems and remain so in ANY environment

Today's Testbed Usage



Tomorrow?

Research Challenge

- Moving from prescriptive to declarative
  - Moving up the “stack”
- Moving from designing to “policing”
  - Protecting the common good without stifling innovation
- Moving from optimal to heterogeneous
  - Trading off optimality for robustness

Optimising for Robustness

- Antifragility (Nassim Taleb) is a property of systems that **increase** in capability, resilience, or robustness as a **result of** shocks, volatility, noise, mistakes, faults, attacks, or failures

A few Words about Repeatability

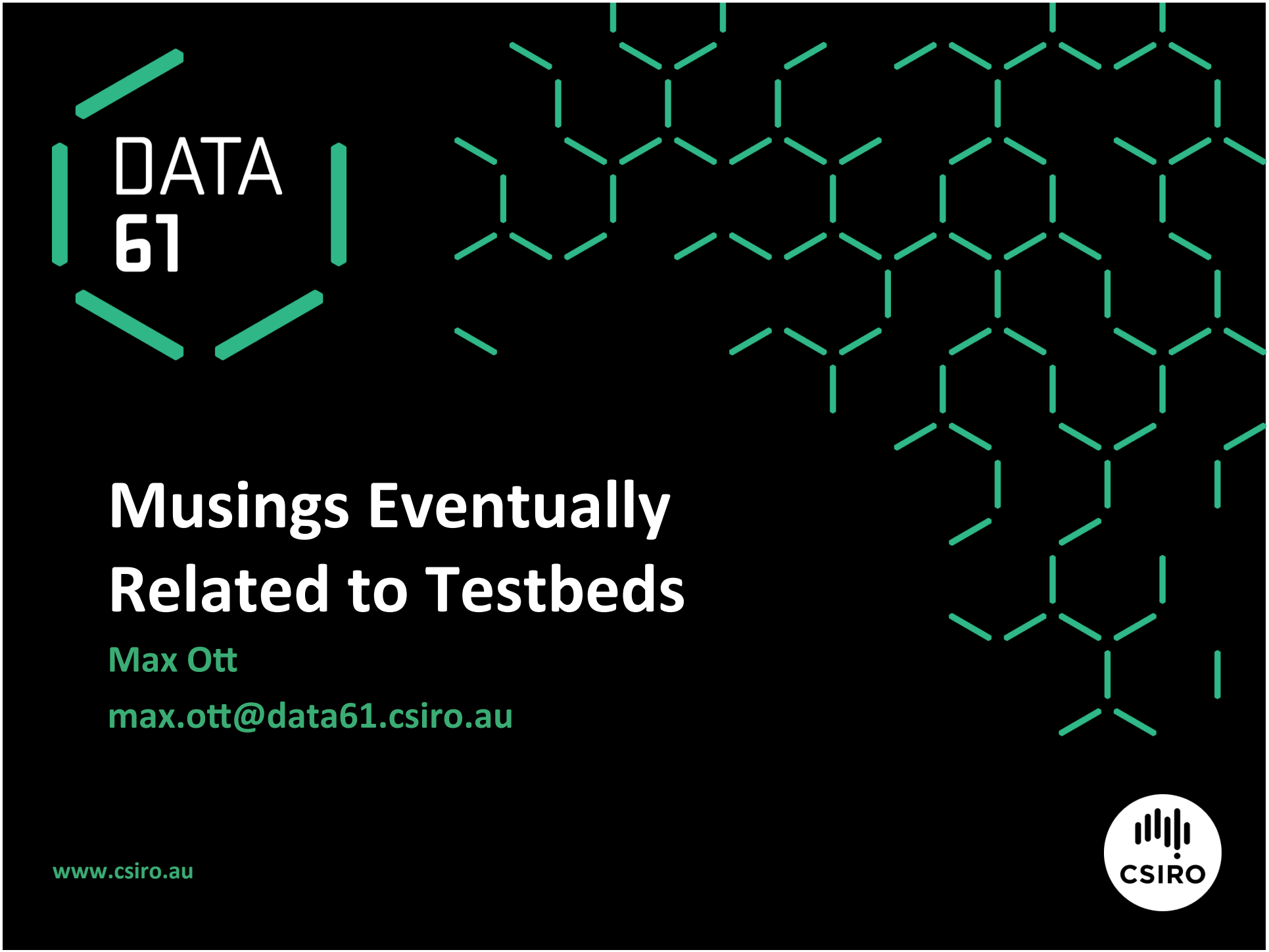
- No Repeatability – No Science
  - Simply the norm in Science
  - Repeatability does NOT mean getting the exact same result – that's why we (should) teach Statistics!
- Repeatable ≠ Science
  - Repeatability would be constraint to specific context
  - Scientific results should be predictive!

Why is Repeatability so Hard?

- Many moving parts
- Difficult to capture entire context
  - OS, driver versions, library version, …
- No culture to appreciate methodology
  - Methodology – what?
  - “No space in paper to describe methodology”
- No culture to appreciate verification
  - No chance to get paper published which simply verifies a previously published result

Conclusion

- These are exciting times!
- Increased programmability dramatically shortens time from idea to broad applicability
- Requires safe environments to experiment
  - to quickly &safely move from the small to the large
- Impact has many faces – think bigger!
- Use this facility to do GREAT things!



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