

# Towards a Science of Censorship Resistance

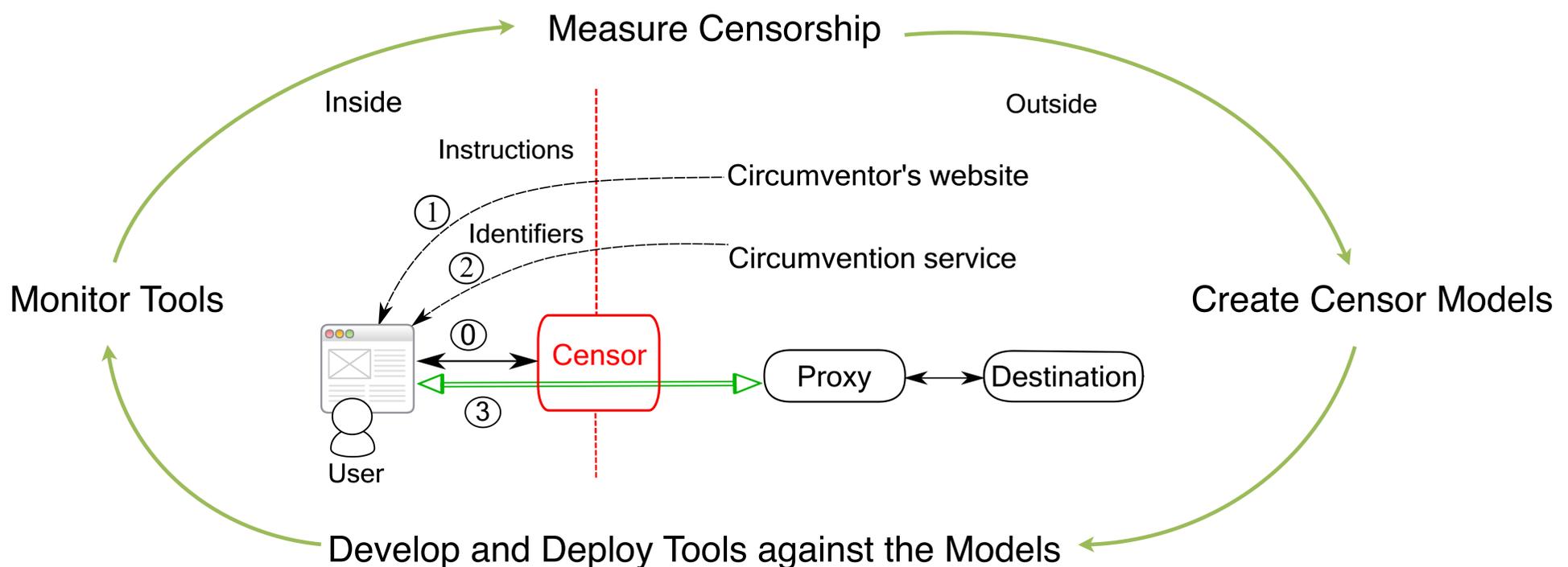
PIs: Vern Paxson (ICSI), Mark Allman (ICSI), Nicholas Weaver (ICSI),  
Nick Feamster (Princeton), Phillipa Gill (UMass), Jedidiah R. Crandall (UNM)

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Internet censorship imposed by nation-states blocks access to certain types of information, while citizenry in censored countries in turn attempt to circumvent the censor's restrictions. Much of the work in this area has been reactive in nature, and researchers often struggled to gauge just what sort of threat models to emphasize.

Our goal is to establish a science of censorship resistance: principled approaches for understanding the nature of the problem space and how to best achieve desired outcomes. We combine extensive *empiricism* with *models* to distill empirical observations into apt *abstractions*.

## Incorporating Science in Censorship Resistance

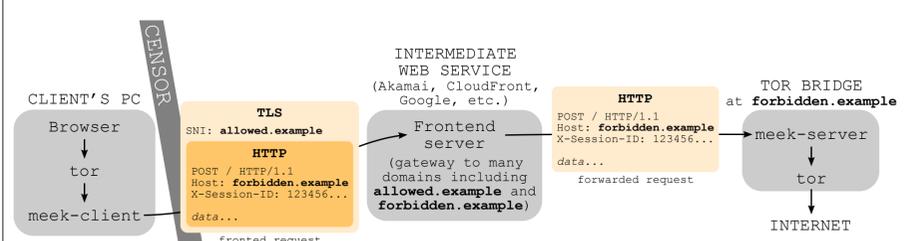


### Grounding Censorship Research into Empiricism

We studied 55 circumvention systems and real blocking events of Tor. We found:

- Real censors attack channel *setup*, prefer simple features, and favor low false positives.
- Research focuses on channel *usage* and considers passive monitoring and less robust attacks.

### Blocking Resistant Censorship Circumvention



Deployed as a Tor pluggable transport  
Used by over 5,000 users daily

### Large-scale Detection of Connectivity Disruptions

- Developed scalable, statistically robust methods for continuous monitoring of global censorship.
- Validated our measurements in more than 180 countries over 17 days.

### Discrimination of Anonymous Users

- Over 1.2% of the web blocks Tor at layer 3/4
- ~20% of the Alexa top webpages block Tor
- 3.8% of websites block searching and 7.4% block login through Tor

### Discovering Censors' Technical Measures

Systematically experiment on censors to determine how they block traffic from a given circumvention technology.

### Testing Harness for Circumvention Systems

Automatically compare circumventing traffic to non-circumventing traffic. The differences correspond to weaknesses in the tool.

Interested in meeting the PIs? Attach post-it note below!