“It’s a Series of Tubes”:
Exploring Net Neutrality Policy through Critical Making

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Abstract

As an increasing proportion of social life—from education to medicine, business, and national security—becomes mediated through the single medium of the Internet, what are appropriate policies to manage and fairly prioritize the flow of packet traffic through networks? Our critical making exercise will use a car track set as a way to experiment with network management policies and the value choices they imply.

Keywords: critical making, network neutrality, internet policy, materiality of computation.

As an increasing proportion of social life—from education to medicine, business, and national security—becomes mediated through the single medium of the Internet, what are appropriate policies to manage and fairly prioritize the flow of packet traffic through networks? In recent years, the issue has become polarized in terms of a “Net Neutrality” debate that pits two camps against one another. On the one hand, activists and scholars such as Larry Lessig and Tim Wu argue that an essential ingredient of the Internet’s power to foster innovation lies in the non-discrimination design principle that treats all packets equally, regardless of their origin, destination, or purpose. On the other hand, network service providers argue that, given the limitations and high costs of communication infrastructures, they must resort to network management practices in order to maximize service for all users. This is particularly the case given constant growth in network traffic due to new content distribution platforms (Netflix videos account now account for half of all internet traffic), higher resolutions devices (e.g., Apple’s “Retina” displays), or new applications (e.g., Siri). Network providers use both technical and economic approaches to network management: technical approaches include throttling, caching, and optimization, such as transcoding of video and images; economic approaches include tiered service (e.g., limited vs. unlimited data plans), peak/off-peak pricing, and bundling (e.g., family plans). The FCC has currently given free reign to wireless service providers to implement any “reasonable” management practices they deem necessary, as long as they “transparently” disclose them (see http://www.fcc.gov/topic/open-internet).

This workshop proposes to explore network management practices and the politics of net neutrality through a critical making experiment. Critical Making, a mode of engagement that links critical reflection and physical production, supplements previous forms of policy analysis through the creation of specific, goal-oriented experiments. These experiments are intended to re-map the relationship between conceptual and linguistic forms of social analysis (e.g. social scholarship), and materially and embodied forms of shared making. In past work (Ratto & Hockema, 2009; Ratto, 2011a; Ratto, 2011b ) we have found these techniques to be useful in exploring stakeholder’s critical issues around new technological developments. Critical Making experiments have been carried out in London, Amsterdam, Scotland, the US, and in Canada. (see previous citations for specific examples.)

The planned event will explore issues of net neutrality as well as possibilities, potentials, and challenges of using critical making as a tool for policy support and academic reflection. Our focus for this workshop will be two-fold; first to use a focused critical making exercise to explore questions relative to the allocation of scarce computational resources; and second, to review our shared process from a more ‘meta’ level and to think about how it supplements and extends more traditional types of policy analysis.

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The problem of maximizing packet traffic on networks is largely identical to that faced by engineering and policy makers as they seek to maximize road traffic on the congested roads of cities. In this case as well, economic (e.g., toll lanes) and technical (e.g., metered highway entrances) approaches are both used to maximize service and prioritize certain types of traffic. Our critical making exercise will use a car track set as a way to experiment with network management policies and the value choices they imply. Working in teams, session participants will use software and hardware pre-assembled by the conference organizers to build simple radio-controlled robot vehicles. These vehicles will represent individual packets on a network. Participants will customize both a central controller and the physical landscape in order to explore mechanisms for differential packet management. We will then use the building and testing process to think and talk about the above topics, and about how shared ‘making’ practices can supplement traditional qualitative and quantitative policy analysis.

Participants will be required to bring laptops (one per team) to the session, be prepared to install the Arduino software IDE, and to engage in hands-on work. All materials will be provided by the organizers. NO EXISTING TECHNICAL EXPERTISE IS REQUIRED. If possible, the resulting objects could be displayed during the conference at the poster session or other event.

Workshop Plan

The workshop will require about 3 hours and will consist of 5 phases (we thus require 2 back-to-back sessions of 90 minutes):

1. A brief explanation and exploration of critical making, of the net neutrality debate, and of current network management practices. This will include introductory and framing remarks by the organizers and group discussion.
2. An overview of the technologies being used, guided installation of necessary software, and description of the pre-assembled toolkits.
3. A hands-on assignment involving designing, building, trouble-shooting, and testing the prototypes.
4. Group discussion of the projects, their commonalities and differences, what they offer for critical reflection on resource sharing and allocation.
5. A final discussion on critical making as a tool for exploring policy issues.

All materials will be provided by the organizers. The workshop should be limited to 25 participants. A/V requirements are a Mac-compatible video projector. The room should be reconfigurable with movable tables and chairs.

The workshop will build on similar events and workshops held at previous iConferences, including the 2012 “Values|Making|Critique|Design” workshop, the 2012 “Design Jam in iSchools’ even, the 2011 “Storytelling, Narratives and Metaphors in the Design and Use of ICTs” workshop, and the 2011 Poster and Roundtable session, “Design Methods for the Information School Curriculum.” These workshops and events have shown that iConference attendees share a significant interest in design issues and methodologies. We aim to attract such participants as well as those interested in internet policy. The workshop’s design and aim are central to the mission of the iSchool movement, to connect technology, information, and people. It makes uses of innovative pedagogical techniques that fuse together technical and sociological exploration.