CS 6480: Paper reading summary
HA 8.a

José Monterroso

School of Computing, University of Utah

September 21, 2020

1 Tussle in Cyberspace: Defining Tomorrow's Internet

Paper discussed in this summary is "Tussle in Cyberspace: Defining Tomorrow's Internet" [3].

1.1 First pass information

1. *Category:* This paper appears to be a mix of an analysis of an existing system, as well as a description of a research prototype. The analysis part deals with the internet itself and current issues at the time this paper was published. But the authors also propose some design principles that are intended to be accommodated within the future internet.

2. *Context:* The technical area of this paper relates to internet architectures. However, this paper seems to target the sociopolitical attributes of the internet. This paper references a few of the main concepts and ideas from our previous paper on the DARPAnet [2].

3. *Assumptions:* The authors assume that the internet today is owned by multiple stakeholders that have different interests and are pursuing their own particular interests. I agree with their assumption because at the end of the day ISPs are businesses and businesses need to make money. Another assumption they bring up was that the creators of the internet shared a common goal. Now this assumption is true with regards that everyone wanted to connect various networks together but I hardly agree with the fact that they shared a consistent vision and common sense of purpose. From our previous paper it seemed that the internet got put together with whatever worked best at the time.

4. *Contributions:* As the internet continues to grow, its development imposes new requirements. The authors of this paper contribute by designing new internet design principles, as well as addressing the tussle and providing guidance that may be of value in accommodating the tussle.

5. *Clarity:* From what I have read this paper seems to be well written, it even includes some fancy words in the abstract.

1.2 Second pass information

- *Summary:* The paper introduces the idea of tussle and how it clouds the judgement of different internet stakeholders. In essence, tussle is forcing the internet to take the form of greedy stakeholders, however, the authors argue that it's the job of engineers and researchers to overcome the tussle and produce great results without being clouded by the tussle nor produce more tussle. The authors go into detail with regards to the

types of tussle, some of which are economic, others deal with trust and openness. The authors then discuss end to end arguments. These arguments deal with innovation, reliability and transparency as well as the separation of policy and mechanisms. Lastly, the authors of the paper list a few things that designers should follow. The main idea in this section was to consider the tussle that you will unearth with your creation and how you can potential analyze and reduce the tussle. To conclude, tussle will always occur when we create things and in some cases it's nearly impossible to remove the tussle, however, we should do what we can to work around it and do our best to alleviate the tussle.

1.3 Third pass information

- *Strengths:* I really do think the introduction is a strength of the paper. The introduction does a great job of introducing the tussle, and why we should care to fix it. For every design principle listed, the authors provide a nice example that easily illustrates what they hope people to understand. I also like the format of the paper, especially how the bulleted design principles are used to guide the papers discussion. Furthermore, I liked how the sections were built on each other.

- *Weaknesses:* Although the paper did a great job of discussing tussle, I felt that it lacked concrete answers. Most of the design principles are open ended. The authors rely to many times on the idea that each scenario is different and thus a direct answer can't be provided. However, I would argue that if you are considering a change to the internet you should be specific and bold with your answers. I also felt that the last section on designers really lacked content. I mean they provide an example but hardly list any guidelines or lessons for future designers.

- *Questions:* The paper mentions IP QoS design, and the ToS bits that are used in QoS. I not sure what any of this means, so I will do some research.

- *Interesting citations:* This is the second paper we have read regarding internet architectures and in both papers we find David Clark to be the author. He actually references a few of his own previous works. Looking at the title I think "Rethinking the design of the Internet: The end to end arguments vs. the brave new world" [1] looks like an interesting read.

- *Possible improvements:* I honestly think that their first four sections were great. But I feel towards the end of the paper, during the fifth and sixth sections, the authors lose their motivation. The fifth section is lacking new information if anything it feels like a conclusion. I also feel that the conclusion needs to be redone. They talk about cyberpunk, privacy, and bureaucrats in the conclusion when the paper slightly related to theses topics.

- *Future work:* This paper has opened my eyes to look at all the technology that I have developed or will develop and how it can produce tussle. Future work for the authors could relate to developing application design guidelines that will help designers avoid pitfalls and deal with the tussle of success.

References

[1] Blumenthal, M., and Clark, D. Rethinking the design of the internet: the end-to-end arguments vs the brave new world. *Communications Policy in Transition: The internet and Beyond* (Dec. 2001), 91–139.

[2] Clark, D. The design philosophy of the darpa internet protocols. *ACM SIGCOM Computer Communication Review* (Aug. 1988).

[3] Clark, D., Wroclawski, J., Sollins, K., and R., B. Tussle in cyberspace: defining tomorrow's internet. *SIGCOMM'02* (June 2005), 462–475.