Online Anonymity and Quantum Internet

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Research Area

impact of quantum internet on 2 user types: the daily user and the government & law enforcement sphere.

Ideas

• How can quantum benefit us and what problems will it cause?

• How will the social impact of quantum be different from that of the current form of the internet?

• Which kinds of users should have access to quantum?

Research Process

• I reviewed current literature on how quantum internet works, as well as how anonymity ties into our online behavior.

• The primary obstacle was that there is very little research on the social aspects of quantum, only technical information, but this is also what made my research unique.

Conclusions and Next Steps

• Quantum could provide invaluable aid to law enforcement but also facilitate threats to current cryptographic methods and foster dangerous user behavior

• Potential precautionary policies include requiring identification on certain sites and limiting use to certain groups.

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Research Area

- Initial Interest: Quantum

- Currently in the age of heavy internet use - lots of research available

- Finalized Focus: the impact that the potential of quantum internet to provide absolute anonymity will have on 2 user types: the daily user and the government & law enforcement sphere.

Ideas

Big Picture

• How can quantum benefit us and what problems will it cause?

• How will the social impact of quantum be different from that of the current form of the internet?

• Which kinds of users should have access to quantum?

More detailed interests of mine that I incorporated

• How does quantum actually work?

• How could this new technology impact children?

• What technologies could we use as a model for quantum legislation?

Research Process

- Purely secondary research

- Searched current literature in 2 areas: how quantum works/ its benefits and the social impact of anonymous online presence

- Combined what I learned into an analysis of how quantum would affect 2 types of use: government/law enforcement and personal

Conclusion and Next Steps

- **How it works**

- **Benefits of Quantum**

  - G&LE: communication with whistleblowers, confidential document transfer

  - C: Limiting personal data collection and advertising to children

- **Risks of Quantum**

  - G&LE: impossible to trace cybercrime, breaking existing cryptographic methods

  - C: amplified aggressive behavior and susceptibility to conforming to behavior of an extremist group when anonymous

- **Potential Precautions to Discuss**

  - Requiring Identification

  - Limiting access

Final Product

- 20 page research paper
- Getting the opportunity to research something I was curious about in depth with a great mentor, Professor Kleinrock. Thank you!

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I. Introduction

Anonymous communication has been experiencing a surge ever since personal computers and smartphones have become widely available. With the advent of quantum internet, anonymity will not only be be reachable through complex encryptions or add-on services like Tor, but will be guaranteed by design. While this technology will bring indisputable benefits to government operations, free speech, and personal privacy, it will also carry its own risks. It is important to address issues such as untraceable cyber crime and document decryption risks before quantum internet becomes widely available so that proper precautions can be put in place. For the purpose of this discussion, let us assume that both the governing bodies, including law enforcement, and the general public have access to the new technology. Let us examine what positive and negative effects such a state of affairs would have and how we can maximize the benefits and minimize the costs through the implementation of relevant precautions.

II. What Is Quantum Internet and How Does it Work?

The simplest method of understanding quantum internet is to compare it to something we are all familiar with: the traditional internet. The internet we use today is, simply put, a series of data transmissions from one point to another. Along the way, the information can be transformed or, as we will discuss later, intercepted. The quantum internet accomplishes the same goal: transmission of information. However, the process through which this gets accomplished is what differentiates the two. Ordinary internet transmits packets of data through networks owned by Internet Service Providers, for example AT&T or Verizon. These networks work as a sort of highway which carries the information from the sender to to a recipient. Quantum internet uses a