Speed-of-Light Internet

Brighten Godfrey
Assistant Professor, Computer Science

CURRENT RESEARCH

Towards a high performance internet

Over the last 25 years, the Internet's speed has increased at startling rates; still, researchers are making the Internet even faster. In fact, Dr. Brighten Godfrey, Assistant Professor at the University of Illinois, Urbana-Champaign is working to make the Internet as close as possible to the speed of light, the ultimate physical limitation.

Today, when people and machines interact across the network, even sending a small message and getting a reply can take significant time. That is what's called network latency. "Latency is the key challenge for our interactive experiences on the Internet, whether between people or computers," Godfrey said. "And today every millisecond matters." Network latency has an incredible impact on the ways that consumers choose to purchase goods on the web, play online games, or chat on a video conference. Yet the Internet today is commonly 30 times slower and often 100 times slower than what the speed-of-light limit should allow, even for simple tasks like retrieving the first small part of a web page.

Dr. Godfrey and his team work in several areas of networking, including high throughput data center networks to support big data analytics and cloud computing; network verification to fundamentally improve security and dependability of network infrastructure; and low-latency networking. Dr. Godfrey's research interests, though fundamental in nature, have applications that are practically deployed as well. For example, his group's Performance-oriented Congestion Control (PCC) project is now receiving interest from several major Internet content delivery services, and his work on network verification led to a venture-backed startup. And improvements in Internet latency...

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AFFILIATION

University of Illinois Urbana-Champaign

EDUCATION

- Ph.D., in Computer Science, 2009 , University of California, Berkeley

AWARDS

- Alfred P. Sloan Research Fellow in Computer Science, 2014
- National Science Foundation CAREER Award, 2012
- Dean's Award for Excellence in Research, UIUC College of Engineering, 2015
- UIUC Engineering Council Outstanding Advisor, 2015
- Ranked as Outstanding Teacher or Excellent Teacher in every semester of teaching since 2011

RESEARCH AREAS

Technology, Cybersecurity, Informational Sciences / Internet, Telecommunications

FUNDING REQUEST

Your contributions will support the continued research of Dr. Brighten Godfrey at the University of Illinois at Urbana-Champaign as he works to build a speed-of-light Internet. Donations will fund the necessary $350K required each year to support personnel, equipment, summer salaries, and travel. Specifically, $40K/year will support a Ph.D. student to explore new ideas and gain valuable experience for their future careers. In choosing to donate, you will play a role in tackling fundamental research with real-world implications.