

ECE 4984 – Network Science **New! Fall 2015**

You pick up your **iPhone** while waiting in line at a coffee shop. You **Google** a not-so-famous actor, get linked to a **WIKIPEDIA**[™] entry listing his recent movies and associated **You Tube**[™] clips. You check out users reviews on **amazon**[™] and pick one and stream it in **NETFLIX**[™]. But suddenly the **Wi Fi** logo on your phone is gone and you're on **3G**. Video quality degrades but you don't know if it's the server getting crowded or the Internet is congested. In any case, it costs you \$10 per Gb, so you stop watching and, instead, multi-task between sending **tweets** and calling your friend on **skype**[™], while songs stream from **iCloud**[™] to your phone. You're happy with the call quality, but get a little irritated when you see there are no new wall posts on **facebook**[™].

YOU'RE LIVING A TYPICAL NETWORKED, ONLINE LIFE

You always keep wondering how these technologies work and why, sometimes, they stop working as you expect them to. The goal of this course is to introduce you to these emerging technologies: wireless smart phones, Wikipedia, Facebook, youTube, Twitter, iCloud, and others, that define your networked life. This is done by formulating and answering several key questions carefully selected for their relevance to everyone's networked life as well as for the underlying core engineering concepts and methodologies in the field of networking that are illustrated by their answers such as game theory, graph theory, optimization, and learning:

1. What makes CDMA work for my cell phone?
2. How does Google sell its ad spaces?
3. How does Google rank web pages?
4. How does Netflix recommend movies?
5. When can I trust product ratings on Amazon?
6. Why does Wikipedia even work?
7. How do I viralize a youTube video and tip a Groupon deal?
8. Facebook and Twitter: How to influence people online?
9. Can I really reach anyone in 6 steps?
10. Why do AT&T and Verizon Wireless charge me \$10 a GB?

Class Times: M W 4:00 PM. For more information, contact: Dr. Walid Saad, ECE Department, Durham 447, Email: walids@vt.edu