The stability of the Internet relies on congestion control algorithms (CCAs) to efficiently and fairly share limited network resources. Dozens of congestion control algorithms have been proposed in the past 30 years, however, we still lack a good way to decide whether a new algorithm is reasonable to deploy on the Internet. As we will show in this talk, new algorithms can be dramatically unfair to widely-deployed legacy algorithms. For example, we prove that Google's new CCA, BBR, will always consume a fixed fraction of the link when competing with any number of Cubic flows.

Given the threat of poor performance due to competing heterogeneous CCAs, in this talk we discuss considerations for deploying new CCAs on the Internet. While past efforts have focused on achieving fairness or friendliness between new algorithms and legacy algorithms, we instead advocate for an approach centered on quantifying and limiting harm caused by the new algorithm on the status quo. We argue that a harm-based approach is more practical, more future proof, and handles a wider range of quality metrics than traditional notions of fairness and friendliness.