The thesis will be about large wireless communication networks, and its aim will be to develop the theoretical and practical foundations of how we can apply preemptive use of storage capacity at the nodes, to surgically alter the informational structure of networks, making them faster, simpler and more efficient.

Phds work will seek to jointly view two two approaches (feedback information theory, and coded-multiplexing) that were thought to be disconnected; one uses feedback on the wireless PHY layer, the other uses memory on the (mainly wired) MAC. He will explore evidence of a powerful duality between the two, which can allow us to leverage memory, to bypass the need for real-time-feedback, and to offer unprecedented throughput gains. This partly motivates the thesis work of Adeel Malik which will seek to provide a mathematical convergence of feedback information theory and distributed storage.

In the end, I believe that in this thesis, if successful, the gains can indeed be notable, and they would come at a time when current methods fail to address adequately the anticipated extreme increase in users and demand.