Writeup for the talks of Dr. Shaddi Hasan 10/8

Submitted by: Provakar Mondal

Dr. Shaddi Hasan is Assistant Professor of Computer Science at Virginia Tech. He completed his PhD from Uc Berkley. His research interest lies in the field of networking more specifically fundamental scale and flexibility challenges faced by service provider networks.

At the seminar Dr. Hasan raisins a question can technology advance global development and to answer this question he talked about the large scale infrastructure that reaches most people and this infrastructure can systematically exclude people, often from historically underreserved communities like rural people, poor people, and people in conflict zones. And these are the people who are included in the development context. This system shapes what can be possible like what values and assumptions do these systems embed, who do expect to use the system, and what business models do these systems enable. Later he visualized a modern internet architecture. A modern cellular operator is a large corporation (probably part of a multinational group) and builds a nation-scale network for most people in a country. As a modern example, he mentioned Peru which has modernized its network infrastructure. He also explained what Community Cellular Networks are and mentioned Indonesia as an example.

In the seminar, Dr. Hasan talked about GSM Whitespace that ensures safety, backward compatibility, spectrum flexibility, independence, and trustworthiness. Then he visualized a comparison between Piracy, Unlicensed, TVWS, CBRs, and GSMWS. After that Dr. Hasan described some insights where insight 1 is using phones to scan for in-use channels. Insight 2 is constantly changing channels to prevent squatting. Insight 3 is resuing mobility mechanism.

During the presentation, Dr. Hasan also talked about Nomadic GSM. He also provided some examples of UP sites and Globe sites. Sabang-Limbok, Dikapinisan, Dibut, Diotorin are the examples of UP sites. Where Tanay, Talisay, Binobohan, Balogo are examples of Globe sites. He visualized a comparison curve between these two sites. Outage causes in up sites because of VSAT outage due to weather, discharged batteries, overheating, damaged rf cables, software bugs, etc. He pointed the advantage of Community Cellular Manager as it provides autonomy for community cellular networks, degrades gracefully in the face of failure, enables cooperation between community cellular networks and telcos, and supports the largest community cellular network deployment to date.

In the seminar, Dr. Hasan described a systems approach to building for the edge that can understand the technical, social, political, and economic context to learn why the population is underreserved, identify local capacities that can enable local aspirations, and develop solutions tailored to location conditions that enable equitable and sustainable service. Dr. Hasan also described modularization to make scale-out easier with no centralized on-path components and regaining fate sharing which is a key reason the internet scales so well. As ongoing work, Dr. Hasan pointed out another lesson from rural: embrace heterogeneity.

Dr. Hasan conducted a very interesting and understandable seminar, He pointed out the network infrastructure and current problems and also ongoing research on how the current problems can be solved. He also answered the questions of the students in a very helpful manner.