

## 2020–2021 Carleton 6G Workshops #1

**Faster-than-Nyquist Signaling**

Monday, 27 July 2020, 1:00–4:30 pm EDT (Ottawa time)

<https://zoom.us/j/94439096686> (300 links)

Faster-than-Nyquist (FTN) signaling is a promising physical layer technique that has the potential to improve the spectral efficiency (bits/sec/Hz) substantially in communications systems. It refers to the transmission of information-bearing pulses at rates beyond the limit developed in the seminal work of Nyquist back in 1920's; transmission at FTN rates results in inter-symbol interference (ISI) at the receiver which deteriorates performance (reliability) rapidly. The roots of FTN signaling trace back to 1960s and 1970s; in particular, it was shown in 1975 that one can approach the asymptotic error rate performance of the conventional Nyquist signaling provided that accelerating the pulses does not exceed a certain limit and that complex detection techniques are in place at the receiver to remove ISI (a non-constructive existence theorem). The progress in silicon technology, advances in signal processing techniques, and the emergence of machine learning as a powerful tool in decision making, compounded by the need for ultra-high transmission rates in future networks, make many experts in both academia and industry wonder whether FTN signaling is a technology whose time has finally come.

Chair: Dr. Halim Yanikomeroglu, Carleton University

Program Chair: Dr. Ahmed Ibrahim, Carleton University

Time	Speaker	Affiliation	Title
13:00-13:10	Dr. Halim Yanikomeroglu	Carleton University Ottawa, Canada	Opening Remarks
13:10-13:45	Dr. Ebrahim Bedeer Mohamed	University of Saskatchewan Saskatoon, Canada	<b>Keynote:</b> A Gentle Introduction to FTN Signaling
13:45-14:10	Dr. Ahmed Ibrahim	Carleton University Ottawa, Canada	A Low-Complexity Detection Scheme for FTN Signaling based on the Alternating Directions Multiplier Method
14:10-14:35	Dr. Michel Kulhandjian	University of Ottawa Ottawa, Canada	Low-complexity Detection for FTN Signaling based on Probabilistic Data Association
14:35-14:45	Break		
14:45-15:05	Dr. Hovannes Kulhandjian	California State University Fresno, CA, USA	Experimentations of FTN in Underwater Acoustic Communications
15:05-15:30	Dr. Enver Cavus	Ankara Yildirim Beyazit U. Ankara, Turkey	Towards an FTN based Experimental Communication System
15:30-16:30	Panel & Brainstorming Session		

[Published Papers of the Speakers on FTN Signaling](#)