

Abstract

# MmWave Channel Estimation and Tracking, Hybrid Beamforming

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Millimeter wave (mmWave) multiple-input multiple-output (MIMO) transceivers employ narrow beams to obtain a large array-gain, rendering them sensitive to changes in the angles of arrival and departure of the paths. Together with the other needs that make fully digital beamforming impossible, it necessitates in hybrid beamforming and specific channel estimation and tracking techniques at mmWave. Overview of such techniques will be given in the talk. Since the singular vectors that span the channel subspace are used to design the precoder and combiner, we also propose a method to track the receiver-side channel subspace during data transmission using a separate radio frequency (RF) chain dedicated for channel tracking. Under certain conditions on the transmit precoder, we show that the receiver-side channel subspace can be estimated during data transmission without knowing the structure of the precoder or the transmitted data.