NIST
National Institute of Standards and Technology
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5G Millimeter Wave Channel Model Alliance

Motivation

There is an industry and research community need for accurately characterizing the mmWave bands above 6 GHz. While there are many groups currently working on 5G channel measurements and modeling (e.g., METIS2020, COST1004, IEEE 802.11ay, ETSI mmWave SIG, NYU Wireless), many of these efforts are focused on developing channel models for specific wireless systems and may be short-lived or adapted once initial standards are put in place.

In response to this need, the U.S. National Institute of Standards and Technology (NIST) has offered to coordinate a 5G mmWave Channel Model Alliance of companies, academia, and government organizations to support the development of more accurate, consistent, and predictive channel models.

To facilitate the formation of this Alliance, NIST plans to convene a kick-off meeting on July 8-9, 2015. The meeting will take place in the NIST Labs in Boulder, Colorado. The purpose of this kickoff meeting is to bring together interested parties to discuss the present state of channel sound-ing and modeling and to develop with the group more detailed plans for the Alliance activities, charter, and organization.

Organization Vision

The 5G mmWave Channel Model Alliance would provide a venue to promote fundamental research into measurement, analysis, identification of physical parameters, and statistical representations of mmWave propagation channels. In addition to making available the raw measurement data, it is envisioned that the alliance would focus on the development of usage scenarios, measurement techniques, and methods for reducing data to channel models.

Participation will be open to all and no membership fee would be required to ensure the broadest participation in the Alliance.

- NIST would coordinate larger face-to-face meetings held every few months (quarterly or bi-annually) to allow rapid identification and resolution of key issues related to mmWave channel modeling.
- NIST would provide a data repository where processed data would be available to all members.
- The envisioned outputs and deliverables for this effort include:
  - Raw data measurements
  - Measurement techniques
  - Channel modeling techniques
  - Improved, comprehensive, predictive channel models that can be fed to standards organizations (for example, 3GPP, IEEE 802) for the development of future mmWave wireless communication systems.

Contact Information

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Value Added

In contrast with today's relatively fragmented and narrow-scoped activities, pulling together resources under one alliance would make it possible to provide an in-depth understanding into the unique mechanisms related to millimeter-wave propagation and then be better equipped to address as the needs arise the specifics of each wireless systems applications.

A clear and immediate goal of the group would be to develop improved models by use of the proliferation of data currently being collected by various channel sounding techniques. As an example activity, data collected in standardized scenarios by multiple channel sounders, each with its own unique capabilities, could provide a more comprehensive view of a given propagation environment than could be achieved with a single channel sounder alone. In addition, channel sounders with different antenna types could provide a more complete picture of the required spatial characteristics for the models.

The development of common processing routines and analysis techniques would enable study of channel characteristics from a number of types of channel measurement set-ups. This characterization of the environment from multiple points of view would provide a strong physical basis, and, ultimately, more accurate and predictive channel models.

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