

Peer Review

Review of: "Higher-Order Meta Distribution Analysis of Wireless Systems with Application to the Reliability of UWB THz Networks"

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About the platform

The first paragraph has nothing to do with the exact article; it is regarding the platform. This is the first time I am experiencing an open and post-publication review system, and I'm quite supportive of the whole endeavor. Theoretically, it will be a boon to the scientific community. However, I'm equally skeptical regarding the sustainability of such a model, as I do not find immediate incentives for the key stakeholders, i.e., the authors as well as the reviewers; rather, there is a lot of risk. From the author's point of view, especially if s/he is a PhD researcher or a junior staff member, I'm not sure whether such a publication will be viewed seriously by prospective employers (maybe in the far future, but that is enough to ruin a career). From the reviewer's perspective, the open review takes off the protective shield of anonymity. Reviewing is a thankless job, and when someone finds that I'm criticizing their work, they may become hostile or take vindictive actions. In summary, this approach would have thrived if the scientific community were full of honest crusaders, which I fear is not the case; scientists are just ordinary human beings.

About the paper

It is always interesting to read a fresh perspective, and in this case, the one I am exposed to is the meta distribution. It took me some time to understand the basic idea, and then I found something in one of the references: 'complementary cumulative distribution function of the success or SIR coverage probability and can be approximated by using the 1st and 2nd moments [DOI:

[10.1109/TCOMM.2018.2889484](#)]. I found a lot of self-citations, but I'm not qualified enough to judge whether this is due to a poor literature search or due to a lack of interest from other researchers.

The writing style maintains a balance between a magazine paper and a journal article, which is engaging. There were example-based validations of the proposed framework, which is another aspect I would like to mention. The style sometimes is unnecessarily passive and wordy.

Technical issues

As far as the Poisson point process and related meta distribution are concerned, the mathematical analysis seems sound. I have concerns related to two other aspects.

(1) It was argued that the analysis is for THz systems in the title itself. However, the biggest challenge in the THz regime is not the frequency dependency (as projected in the article), but rather its light-like line-of-sight propagation requirements, in the absence of which, pointing or misalignment errors occur. Also, often UWB and THz terms were used interchangeably in the article, while they have distinct definitions in the technical literature.

(2) The second concern is about the hierarchical meta distribution. Link-level and system-level QoS metrics have specific meanings in the industry, and while the link-level performance is channel-specific, the system-level metrics are different from what is presented in the article; they are quite application-specific.

Overall, I congratulate the authors for coming forward and for their rigorous mathematical analysis. The paper can be improved if it is presented without the unnecessary generalizations (THz, link/system level, 3GPP) and avoiding jargon (nth order MD reliability) and presented from a purely mathematical point of view (PPP, etc.).

Declarations

Potential competing interests: No potential competing interests to declare.