Circular Letter   13 February 2025
3/LCCE/50

To ITU Member States, ITU Sector Members, ITU Associates and Academia, Relevant International and Regional and National Organizations

Subject: **ITU-R Workshop on "Applications of machine learning in radio-wave propagation prediction" (Geneva, Switzerland, 27 May 2025)**

1   Introduction

By means of this Circular Letter, I wish to announce that the workshop on **"Applications of machine learning in radio-wave propagation prediction"** will be organized by the International Telecommunication Union (ITU) and will be held in Geneva, Switzerland, on 27 May 2025 from 0900 to 1230 hours (CEST). Participants will have the option to join the workshop either in person or remotely.

2   Objective of the workshop

The objective of the workshop is to consider and discuss machine learning (ML) as applied in modelling radio-wave propagation prediction, as well as its use in developing models of parameters or phenomena relevant in the prediction of radio-wave propagation. In the context of ITU, radio-wave propagation prediction models find application in spectrum sharing and compatibility studies, international coordination of spectrum use and the design of national telecommunication networks. Machine learning algorithms have been used for many years in developing radio-wave propagation prediction methods. With the advances in the field of ML, the wide availability of ML frameworks, advances in computer and processing technologies, researchers have the possibility to process very large volumes of data from different sources and potentially develop better prediction models. However, the criteria for the applicability of these tools to radio-wave propagation prediction models need to be studied so that the derived ML-based radio-wave propagation prediction models are statistically representative of all possible conditions of the physical process. The development and application of ML-based models would face considerable challenges. These would include the need for the ML model to learn key propagation characteristics and parameters. Such key parameters are difficult to observe directly and must be inferred indirectly. The number of observables can be large and the relationship between them and the parameters of the propagation radio channel can be non-linear and complex. Owing to the uncertainty and the errors of methods used to measure the observables, the accuracy of the process used to retrieve the key propagation parameters can also be significantly affected. Radio-wave propagation models are often required to provide the statistical characterisation of the propagation parameter over a large probability range and for this scope it is required to collect and process large numbers of samples. Machine learning-based methods face the additional challenge of model explainability. For radio-wave propagation models and especially in the regulatory context, it is necessary to understand how the predictions are related to the underlying physical conditions and propagation phenomena.

3   General information

3.1   The workshop will be co-located with the meetings of ITU-R Study Group 3 (SG 3) and Working Parties 3J, 3K, 3L and 3M, planned to take place from 26 May 2025 to 6 June 2025 (see Administrative Circular CACE/1137 and Circular Letter 3/LCCE/49), and will contribute to the workflow of several ITU Study Groups, namely:

–   ITU-R SG 3: Radio-wave propagation and radio noise

–   ITU-R WP 3J: Propagation fundamentals

–   ITU-R WP 3K: Point-to-area propagation

–   ITU-R WP 3L: Ionospheric propagation and radio noise

–   ITU-R WP 3M: Point-to-point and Earth-space propagation

–   Question ITU-R 236/3: Use of machine learning methods for radio-wave propagation studies

3.2   You are requested to register no later than **13 May 2025** to set up the logistics for the event. Advance registration is mandatory, including for remote participants. Information relating to the event, including the **online registration form**, the programme, the remote participation options and the logistics are available on the event's website at: https://itu.int/en/ITU-R/seminars/ML-in-radio-prop/Pages/default.aspx.

3.3   Further logistic and practical information (including registration and hotel reservation) can be found at: https://itu.int/net4/ITU-R/events.

Should **ITU Member States**, **Sector Members**, **Associates** or **Academia** require visa support, please contact Mr David Botha (david.botha@itu.int). ITU will not provide any visa support to non-ITU members.

For your convenience, a list of recommended hotels and other practical information can be found at: http://itu.int/en/delegates-corner.

3.4   The workshop will be conducted in English only.

3.5   Participation is open to ITU Member States, Sector Members, Associates, ITU Academia and to any individual from a country which is a member of the ITU and who wishes to contribute to the work. This also includes individuals who are members of international, regional, and national organizations. Participation in the workshop is free of charge for all participants, regardless of their ITU membership status. The event coordinator, Mr David Botha (david.botha@itu.int), remains at your disposal for additional information and questions relating to the event.

Mario Maniewicz
Director