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| itu-logo | **International telecommunication union****Telecommunication Standardization Bureau** |  |
|  | Geneva, 24 November 2017 |
| **Ref:** | **TSB Circular 61** | **To:**- Administrations of Member States ofthe Union;- ITU-T Sector Members;- ITU-T Associates;- ITU Academia;- Attendees of the ITU global summit“AI for Good” (Geneva, 7 – 9 June 2017)​ |
| **Tel:** | +41 22 730 5126 |
| **Fax:** | +41 22 730 5853 |
| **E-mail:** | tsbfgml5g@itu.int | **Copy to:**- The Chairman and Vice-Chairmen ofITU-T Study Groups;- The Director of the Telecommunication Development Bureau;- The Director of the Radiocommunication Bureau |
| **Subject:** | **Creation of a new ITU-T Focus Group on Machine Learning for Future Networks including 5G (FG-ML5G) and its first meeting: Geneva, Switzerland, 30 January - 2 February 2018Workshop on Machine Learning for 5G and beyond: Geneva, Switzerland, 29 January 2018** |

Dear Sir/Madam,

1 Further to the agreement by ITU-T Study Group 13 at its meeting in Geneva (6‑17 November 2017), I am pleased to announce the establishment of the [ITU-T Focus Group on Machine Learning for Future Networks including 5G (FG-ML5G)](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx).

2 Under the chairmanship of Mr Slawomir Stanczak (Fraunhofer HHI, Germany), the Focus Group will draft technical reports and specifications for machine learning (ML) for future networks, including interfaces, network architectures, protocols, algorithms and data formats. “The Focus Group’s key objective is to identify relevant gaps in the standardization in order to improve interoperability, reliability and modularity of ML for 5G”, states Stanczak.

3 Participation in FG-ML5G is free of charge and open to all relevant parties such as ML and networking technology experts from network operators, technology vendors, and academia. Anyone interested in updates and announcements related to this group is invited to subscribe to the FG-ML5G mailing list. Details on how to subscribe can be found at: [www.itu.int/en/ITU-T/focusgroups/ml5g](http://www.itu.int/en/ITU-T/focusgroups/ml5g).

4 The group will operate under the procedures set out in [Recommendation ITU-T A.7](http://www.itu.int/rec/T-REC-A.7) and within the agreed Terms of Reference reproduced in **Annex 1**.

5 **First meeting of FG-ML5G**

The first meeting of FG-ML5G will be held at ITU headquarters, Geneva, Switzerland from
30 January to 2 February 2018. The objectives of the first meeting include:

* Discussion on machine learning for 5G networks: Requirements, expectations, challenges, research gaps and standardization needs;
* Agreement on the precise scope and objectives of the focus group;
* Agreement on the group’s structure, expected deliverables, responsibilities, timeline; and
* Review of written contributions and initial development of deliverables.

6 A workshop on Machine Learning for 5G and beyond will be held the day before the first meeting of the FG-ML5G, on 29 of January 2018, at the same location.

7 **Written contributions are invited** on (1) the state of the art for machine learning, e.g., terms, definitions, concepts, requirements, research gaps, methods, formats, (standards) ecosystem; and (2) specific use cases and their standardization questions. Written contributions should be submitted to the ITU Secretariat (tsbfgml5g@itu.int) in electronic format using the templates available from the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx). **The deadline is 19 January 2018.**

8 The meeting will open at 0930 hours on the first day, and participant registration will begin at 0830 hours at the [Montbrillant building entrance](https://www.itu.int/en/about/Documents/itu-plan.pdf). Practical meeting information is set out in **Annex 2**. The meeting agenda will be available from the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx) in advance of the meeting. The discussions will be held in English only. The meeting will be supported by **remote participation** tools. Details for remote participationwill be made available on the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx).

9 To enable ITU to make the necessary logistics arrangements, participants are invited to register online via the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx) as soon as possible, and **no later than 19 January**. Registration is required for remote participation as well as on-site participation.

**Key deadlines:**

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| 3 January 2018 | - Submit requests for visa support letters (a request template can be found [here](http://itu.int/en/ITU-T/info/Documents/Visa-support-letter_MODEL.pdf)) |
| 19 January 2018 | - Pre-registration (online via the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx))- Submit written contributions (by e-mail to tsbfgml5g@itu.int)  |

I wish you a productive and enjoyable meeting.

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| Yours faithfully,Chaesub LeeDirector of the TelecommunicationStandardization Bureau | Latest meeting information |

**Annexes: 2**

**ANNEX 1**

Terms of Reference:
ITU-T Focus Group on “Machine Learning for Future Networks including 5G”
(FG-ML5G)

# 1. Rationale and Scope

The areas of machine learning (ML) and communication technology are converging. The design and management of networks and communication components can be significantly enhanced when combined with advanced ML methods. In particular, fixed and mobile networks generate a huge amount of data at the network infrastructure level and at the user/customer level, which contain a wealth of useful information such as location information, mobility and call patterns. To improve network performance and enhance user experience, new ML methods for big data analytics in communication networks can extract relevant information from the network data while taking into account limited communication resources, and then leverage this knowledge for autonomic network control and management as well as service provisioning. Considering the growing complexity of SDN/NFV and IMT2020/5G networks and beyond, ML may be well applicable for automatic network orchestration and network management. ML also impacts information and communication technology (ICT) in areas related to security or protection of personal information. Regulations in ICT may require that the learning algorithms do not provide personally identifiable information (PII). Hence, ML algorithms that also work under uncertainty and incompleteness are of increasing interest in ICT. These aspects are relevant when considering formats that deliver data to ML algorithms.

The standardization of interfaces, processes and data formats is of high importance in communications, because it increases the reliability, interoperability and modularity of a system and its respective components. Standardized formats may be needed to specify how to train, adapt, compress and exchange individual ML algorithms, as well as to ensure that multiple ML algorithms correctly interact with each other and that certain security or protection of personal information requirements are fulfilled.

Furthermore, it can be expected that a large number of new ICT applications would emerge, if the complexity of state-of-the-art ML algorithms, especially deep neural networks, can be reduced to a level which allows their use in computationally/energy limited environments.

This Focus Group would play a role in providing a platform to study and advance the various ML approaches for future networks including 5G.

# 2. Objectives of the FG-ML5G

The objective of the Focus Group is to conduct an analysis of ML for future networks in order to identify relevant gaps and issues in standardization activities related to this topic. Such analysis includes an overview on related activities by other SDOs and groups. Furthermore, it includes technical aspects such as use cases, possible requirements, architectures and others. The Focus Group also serves as an open platform for experts representing ITU members and non-members to quickly move forward studies on ML related to future networks including 5G.

More precisely, the objectives include:

* To help adoption of ML in future networks including architecture, interfaces, use cases, protocols, algorithms, data formats, interoperability, performance, evaluation, security and protection of personal information;
* To study, review and survey existing technologies, platforms, guidelines and standards for ML in future networks;
* To recognize and highlight the various perspectives for the future of networks and computing systems involving ML;
* To identify aspects enabling safe and trusted use of ML frameworks;
* To review and study how to train, adapt, compress and exchange ML algorithms in future networks, and how multiple algorithms interact with each other;
* To identify possible requirements of ML applied to future networks taking into account a variety of fixed and mobile communication stacks, and to promote the development of new ML methods that will be able to meet these requirements;
* To identify possible requirements on network functionality, interfaces and capabilities to use ML;
* To identify challenges in the standardization activities for ML in communications;
* To produce a gap analysis of ML in order to identify the relevant scope of ITU-T recommendations on these topics and develop a roadmap for ML;
* To establish liaisons and relationships with other organizations which could contribute to the standardization activities for ML.

# 3. Structure

 The FG-ML5G may establish sub-groups if needed.

# 4. Specific Tasks and Deliverables

* To provide terminology and taxonomy for ML in the context of future networks, as well as a guideline on the approaches, tools, applications and platforms related to this topic;
* To gather information on initiatives pertaining to ML for future networks and to identify existing standards, ML methods, best practises and challenges for the adoption of ML in future networks;
* To describe the ML ecosystem for future networks and the roles and activities related to different stakeholders in this ecosystem;
* To analyse possible requirements on ML applied to future networks;
* To draft technical reports and specifications for ML for future networks, including interfaces, network architectures, protocols, algorithms and data formats;
* To analyse the impact of the adaption of ML for future networks (e.g. autonomic network control and management);
* To send the final deliverables to ITU-T Study Group 13 at least four calendar weeks before the parent group’s next meeting in accordance with Recommendation ITU-T A.7;
* To analyse the standardization gaps related to ML for future networks and develop a future standardization roadmap, taking into consideration the activities currently undertaken by the various standards developing organizations (SDOs) and forums;
* To develop a list of standards bodies, forums, consortia and other entities dealing with aspects of ML and liaise with organizations, which could contribute to the standardization activities on ML;
* To organise thematic workshops and forums on ML for future networks, which will bring together all stakeholders, and promote the FG activities and encourage both ITU members and non-ITU members to join its work.

# 5. Relationships

This Focus Group will work closely with SG13 through co-located meetings when possible. It will establish and maintain a collaboration arrangement with ITU-R WP5D by several means (for instance, liaison statements). Furthermore, the FG-ML5G will collaborate (as required) with other relevant groups and entities, in accordance with Recommendation ITU-T A.7. These include municipalities, non-governmental organizations (NGOs), policy makers, SDOs, industry forums and consortia, companies, academic institutions, research institutions and other relevant organizations.

# 6. Parent group

The parent group of the FG-ML5G is **ITU-T Study Group 13** “Future networks, with focus on IMT‑2020, cloud computing and trusted network infrastructures”.

# 7. Leadership

See clause 2.3 of Recommendation ITU-T A.7.

# 8. Participation

See clause 3 of Recommendation ITU-T A.7. A list of participants will be maintained for reference purposes and reported to the parent group.

It is important to mention that the participation in this Focus Group has to be based on contributions and active participations.

# 9. Administrative support

See clause 5 of Recommendation ITU-T A.7.

# 10. General financing

See clauses 4 and 10.2 of Recommendation ITU-T A.7.

# 11. Meetings

The Focus Group will conduct regular meetings. The frequency and locations of meetings will be determined by the Focus Group management. The overall meetings plan will be announced after the approval of the terms of reference. The Focus Group will use remote collaboration tools to the maximum extent, and collocation with existing SG13 meetings is encouraged.

The meeting dates will be announced by electronic means (e.g., e-mail and website, etc.) at least four weeks in advance.

# 12. Technical contributions

See clause 8 of Recommendation ITU-T A.7.

# 13. Working language

The working language is English.

# 14. Approval of deliverables

Approval of deliverables shall be taken by consensus.

# 15. Working guidelines

Working procedures shall follow the procedures of Rapporteur meetings. No additional working guidelines are defined.

# 16. Progress reports

See clause 11 of Recommendation ITU-T A.7.

# 17. Announcement of Focus Group formation

The formation of the Focus Group will be announced via TSB Circular to all ITU membership, via the ITU-T Newslog, press releases and other means, including communication with the other involved organizations.

# 18. Milestones and duration of the Focus Group

The Focus Group lifetime is set for one year from the first meeting but extensible if necessary by decision of the parent group (see ITU-T A7, clause 2.2).

# 19. Patent policy

See clause 9 of Recommendation ITU-T A.7.

**ANNEX 2**

**First meeting of ITU-T FG-ML5G:
Geneva, Switzerland, 30 January to 2 February 2018**

**Practical meeting information for participants**

**WORKING METHODS AND FACILITIES**

**DOCUMENT SUBMISSION AND ACCESS:** The meeting will be run paperless. Written contributions are encouraged and should be submitted by e-mail to tsbfgml5g@itu.int by **19 January 2018** at the latest using the document template available on the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx). Access to all input and output documents will be provided from the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx) (TIES or Guest account required).

**WIRELESS LAN** facilities are available to participants throughout ITU headquarters (SSID: “ITUwifi”, Key: itu@GVA1211). Detailed information is available on‑site and on the ITU‑T website (<http://itu.int/ITU-T/edh/faqs-support.html>).

**E-LOCKERS** are available for the duration of the meeting using participants’ ITU-T RFID identity badges. The e‑lockers are located on the ground floor of the [Montbrillant building](https://www.itu.int/en/about/Documents/itu-plan.pdf).

**PRINTERS** are available in the delegates’ lounges and near all [major meeting rooms](https://www.itu.int/en/about/Documents/itu-plan.pdf). To avoid the need to install drivers on participants’ computers, documents may be “e‑printed” by e-mailing them to the desired printer. Details at: <http://itu.int/go/e-print>.

**LOAN LAPTOPS** are available from the ITU Service Desk (servicedesk@itu.int) on a first-come, first‑served basis.

**PRE-REGISTRATION**

**PRE-REGISTRATION:** Pre-registration for on-site or remote participation is to be done via the [FG-ML5G homepage](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx) **no later than 19 January**.

**VISITING GENEVA: HOTELS, PUBLIC TRANSPORT AND VISAS**

**VISITORS TO GENEVA**: Practical information for participants attending ITU meetings in Geneva can be found at: <http://itu.int/en/delegates-corner>.

**HOTEL DISCOUNTS**: A number of Geneva hotels offer preferential rates for participants attending ITU meetings, and provide a card giving free access to Geneva’s public transport system. A list of participating hotels, and guidance on how to claim discounts, can be found at: <http://itu.int/travel/>

**VISA SUPPORT**: If required, visas must be requested before the date of arrival in Switzerland from the embassy or consulate representing Switzerland in your country or, if there is no such office in your country, from the one that is closest to the country of departure. Deadlines vary, so it is suggested to check directly with the appropriate representation and apply early.

If problems are encountered, the Union can, at the official request of the administration or entity you represent, approach the competent Swiss authorities in order to facilitate delivery of the visa. Any such request must specify the name, function, date of birth, passport information, and registration confirmation for all applicants. Requests should be sent to TSB **no later than one month before the meeting** by e-mail (tsbreg@itu.int) or fax (+41 22 730 5853), bearing the words “**visa request**”. A sample request can be found [here](http://itu.int/en/ITU-T/info/Documents/Visa-support-letter_MODEL.pdf).

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