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| **ITU-T Focus Group on AI for Health** | |
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| **Abstract:** | This document contains the report of the third meeting of ITU-T Focus Group on Artificial Intelligence for Health (FG-AI4H). R1 lists in the summary the new areas and corrects some affiliation information as well as information regarding adoption of Psychiatry as a topic area. |

Executive summary

The third meeting of the FG was held in Lausanne, Switzerland, at the SwissTech Convention Centre on the EPFL campus, 23-25 January 2019, preceded on 22 January 2019 by the third ITU/WHO Workshop on Artificial Intelligence for Health. About 130 participants attended the workshop and meeting.

The following were the main results from the third meeting.

Ms Shan Xu (CAICT) was approved as a vice-chairman of the FG, replacing Mr Min Dong (CAICT).

The FG renewed the mandate of its other two Ad-Hoc Groups (AHGs):

– Test data set assessment

– Thematic classification scheme

The FG reviewed 26 input documents (21 proposals) and issued the following output documents:

– C-103: Data handling and acceptance policy

– C-104: Updated draft thematic classification scheme

– C-105: Generic topic description document (TDD) outline

– C-106: Draft Call for Benchmarking Technology

– C-107: Template for call for topic group participation

The FG agreed to establish the following topic areas:

* Cardiovascular Risk Prediction using Machine Learning – led by Benjamin Muthambi (WatIFHealth, South Africa)
* Psychiatry, coordinated by Nicolas Langer (Zurich Univ., Charité Berlin).
* Tuberculosis (TB) – led by Manjula Singh (ICMR, India)

The next meeting of FG will take place in Shanghai, China, 3-5 April 2019 preceded by the fourth ITU/WHO Workshop on Artificial Intelligence for Health on 2 April. Updated information will be made available on the FG webpage, <https://itu.int/go/fgai4h>.

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# General

The third meeting (Meeting C) of the ITU-T Focus Group on Artificial Intelligence for Health was kindly hosted by the École Polytechnique Fédérale de Lausanne (EPFL) on 23, 24, and 25 January 2019 at the SwissTech Conference Center on the EPFL campus in Ecublens, Switzerland. It was preceded by the third ITU/WHO Workshop on Artificial Intelligence for Health at the same venue on 22 January.

# Approval of agenda and allocation of documents

The agenda in [C-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-001.docx) was reviewed and approved. Minor updates were done during the meeting and the latest revision is R5.

The list of all documents is provided in [C-010-R2](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-010-R1.docx).

# IPR

The chairman introduced the ITU IPR policy (see C-001 Appendix A) and asked whether any of those present were aware of any patents (applied or granted) that affected the FG work. None were declared and nothing was brought forth.

# Management matters

Ms Shan Xu (CAICT, China) was appointed to replace Mr Min Dong (CAICT, China), who is unable to continue to devote time to the function. The FG thanked Mr Min Dong for his support and contributions during the initial phase of the focus group activity.

# Report on Meeting B and update on interim activities

## Report of Meeting B

The report of the FG meeting held in New York City, 15-16 November 2018 in [B-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-101.docx) was approved without changes after being introduced by the FG chairman.

## Reports from Ad-Hoc-Groups;

[C-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-004.docx) - Progress report: AHG Data handling and data acceptance

The ad-hoc-group on “data acceptance and handling” had the mandate to merge documents B103 and B105 in order to draft a unified data policy document for consideration by the FG. In addition, the ad-hoc-group was asked to discuss data encryption, and to identify where the data policy document needs to be specific (“shall”) and where it can be flexible (“should”). The ad-hoc-group held two teleconferences between Meeting B and Meeting C. The results of the ad-hoc-group are found in C-004.

The mandate of the AHG “Test data set assessment” was renewed until the next meeting (D, Shanghai) with the same Co-conveners.

The mandate of the AHG “Thematic classification” was renewed until the next meeting (D, Shanghai) with the same Co-conveners.

# Outcome of the workshop

[C-002](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-002.docx) (Workshop Summary; Chair)

FG vice-chairman Marcel Salathé introduced the summary of the third ITU/WHO Workshop on Artificial Intelligence for Health held on 22 January 2019.

Topics suggested for future workshops:

* AI for social impact: scalability (projects that scaled up); sustainability, implementation and how to measure (social) impact of AI4H (also to consider, each region has a specificity on how to implement), cost/benefits analysis before (large?) deployments, what is the acceptable level of bias?
* Learning from successful and failed projects (Failure has varied angles: benchmarks not relevant; lack of implementation/pick-up)
* Learnings from other groups that did benchmarking
* Ethics aspects should not be forgotten
* What is the right moment to deploy (not too early, not too late)?

Partnership afterwards:

* Regulation
* Epidemiology / public health
* Country development / low resource settings

Called for programme committee advisor volunteers.

# Update on projects and discussion of contributions

## Thematic classification

Reference: [B-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-104.docx)

[C-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-011.docx) Marc Lecoultre (Business Investigation)

Focus is to define outputs, for this reason e.g. machine learning is not included. It was agreed to amend the thematic classification document accordingly.

[C-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-016.docx) Chongqing University

This document proposed modifications and additions to the thematic classification in document   
[B-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-004.docx). The purpose is to further help the data users and regulators to better understand the nature, origin and quality of the data leveraged by the very AI product. The proposal was agreed.

The updated document is found in [C-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-027.docx). At the closing plenary, it was noted that some terms like Optimization and Perception would need further development. The AHG on thematic classification was reconfirmed to further discuss and finalize the thematic classification scheme.

## Ethical issues

During the discussion of status reports, a general discussion on ethical aspects emerged. The main takeaways were:

* Prevention tools – do they raise ethical issues? Should ensure that determinations remain private. "Do no harm" principle. FG provides tools and their use would rely on the ethical requirements of the service provider.
* If there are already methods that do tasks without AI/machine learning tools, so it would be a new way of doing something that is already done (more efficiently, lower cost, etc.), so no new ethical issues should rise. Ethical issues would be more evident when trying to do new things, new protocols, that cannot be currently done without AI/ML.
* If we see a project where a type of diagnostics can be used without consent, then it is something we should stay away? FG to identify a set of principles.

## Status reports

General notes:

* Status reports should not be delta documents but include all relevant information moving forward.
* All proposals should clearly identify the outputs from the AI algorithm, so that meaningful benchmarks can be generated.

Status reports were received for all but the classifying autism through analysis of brain imagery use case. Discussions were as follows.

### Guiding anti-venom selection with snake-identification imagery analysis.

[C-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-012.docx) University of Geneva

[Rafael Ruiz de Castañeda presented] Snake identification for good choice of anti-venoms after a biting incident. Bring herpetology expertise in the medical domain via AI-based applications. Building large dataset around snakes from all over the world. Crowdsourcing also explored. Over 230000 snake images for about 2000 species. Crowdsourcing brings some degree of bias to the data. Skewed taxonomically (some species more represented), geographical skewed (more data from certain areas). Privacy issues are of less concern, as the images come from animals. Large sets of images are open or publicly available, but not so much private data is available. What is the ratio of a particular species in the private dataset is needed to make it representative? (Question for the AI experts.) Secret data here is of professional quality, public data is noisier (lower quality).

For a user - risk of getting sicker while trying to get the image. Bystander's play a role in collection, risk of secondary envenoming.

Can the bite be used to identify the snake? Plan to collect bite images and map it to species. However, it is very difficult to relate the anatomy of the byte with a snake, due to practical conditions when the byte happens. Can the bite help identify whether it is a dry bite (assistance to triage)? Could the tool give advice on non-venomous bites to avoid going to an ER? This is unwise.

Output variables: specify snake species as well as the treatment (e.g. anti-venom, ventilator); amount of anti-venom.

Should be careful with impression – the existence of a bite would ensure they are saved after a bite (e.g. availability of treatment within the critical timeframe).

A revised version was prepared and posted as: [C-012-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-012-R1.docx).

### Evaluating and reducing the elderly’s risk of falling

[C-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-014.docx) Fraunhofer AICOS

[Ines Sousa presented, remotely]

Outputs: probability of falling as binary classification result, fallers (people that had a fall within 12 months of the initial assessment) vs. non-fallers (used in the relevant literature). Other outputs would be possible, e.g. continuous probability of fall, but it was claimed that it would be substantially more difficult to achieve. Inputs are described in the literature, but as separate elements. This project aims at combining them. Field work done by the school, but data collected in multiple settings in Portugal. Possible data would contain geographical coordinates.

Annotation method – verifiable, reliable? Method as in the literature. One month is usually sufficient recent for patients to remember the event. If there is a fall, more details are asked. Validation of the reported incident is done via an organization providing assistance to the patient. Classification of frequent faller from an infrequent faller?

This is a pre-screening fall to detect people who are likely to suffer a fall and recommend follow-up with a fall clinic.

### Diagnosing skin lesions through imagery analysis

[C-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-015.docx) Fraunhofer AICOS

[Maria Vasconcelos presented, remotely]

Have one public and one private dataset, both with the same annotations. More datasets are being developed, but they will not be public.

Different classes, what is the distribution in the various datasets. Three levels, 106 as low risk, 43 as medium risk, 16 as high risk. In their solution, only two, low risk and moderate/high risk (due to data unbalance in the datasets).

Question: would it make sense to wait a bit with this use case until there more images? It depends on the goal. Make a call for data in dermatology, a private data set. List of public datasets was given Multiple sources of data.

Need to know precisely what the outputs are (comment valid for all projects).

See also section 7.4 for the discussion of related document C-021.

### Evaluating the accuracy of "symptom assessment" applications

[C-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-019.docx) Ada Health

[Henry Hoffmann presented]

Should agree collectively on the objective of tool – (pre-)diagnosis/triage, action? Definition of benchmark to avoid measuring the wrong thing.

For wide acceptance, validity of symptom checkers and vignettes should be checked with randomized clinical trials. At the current stage, what is possible is to use annotated cases testing theoretical cases, before clinical trials could be meaningfully done. Validation of solutions should include a varied number of case sets, from different providers.

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| *General*  Topic cases / use cases  Call for topic groups – get all the data needed to set up benchmarks for a particular problem area.  Proposals for use cases  Topic groups – call for participation in topic  NB - *Use cases* will be re-labelled as *topic groups*, as it is perceived that use case is a loaded term across the various stakeholders. |

### Mining medical data to understand Alzheimer’s disease

[C-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-020.docx) UNIL, CHUV

[Kherif Ferah presented]

Large dataset collection for 6.2k patients (diagnostics, MRI, Screening instrument or for interventions? Target people that would be identified at risk, currently at 60% accuracy. People that come to the hospital with some related complaints (memory loss, etc.).

Input data: curated, annotated data in various domains. Clinical scores (e.g. memory assessment questionnaires, …), imagery (PET, MRI, fMRI), blood measurements (biomarkers). Output: identify as baseline the diagnostics made by clinicians (for early detection of Alzheimer's).

Need to reduce the dimension to 300 data points (down from ~2000).

Dataset: part is research data for training (1/3). In hospital, subjective complaints but no Alzheimer's diagnostics, 1/3 are patients.

Need to have a clear idea of inputs and outputs before benchmarks need to be defined.

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| General:  Projects have different missing parts:   * More data needed; or * Varied expertise bank to develop the machine learning experiment; * Collaboration between different parties to develop the benchmarks; combine data sets * Build a community around a topic.   Competitive component? |

### Analysing imagery to detect diabetic retinopathy

[C-026-R1](http://ttps://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-026-R1.docx) Xtend.ai / Medindia.net

Small number of ophthalmologists worldwide. Use of remote doctors (telemedicine).

Output: Six categories: non-gradable, no retinopathy, small, mild, severe, most severe.

Data labelling: board-certified doctors

Private data sets – how to ensure

Data acquisition: dedicated hardware (scanners) & mobile phone. The later has not been included. There is great dependency on the camera/lens specification (depth of field), but also whether pupil is dilated or not.

Annotation – how many doctors? 1 or 2.

Percentage: unreadable 10%

### Assessing the risk of breast cancer in histopathological images

[C-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-018.docx) Charité Berlin et al.

[Frederick Klauschen presented]

Even though the topic of the research is rather specific, it can be generalized to a number of use cases.

Annotation (positive & negative annotations) is flexible and can be changed to other use cases. Made by one expert.

Datasets will be drawn from a number of institutions. Image resolution is 1000x1000, 400x magnification. 5-10 annotated images for overview; 25-50 densely annotated images. Unsure what would be a reasonable number of images for meaningful benchmarking.

Project is ready to move to the next step and was adopted as a new topic area led by Frederick Klauschen.

## New topics

[FGAI4H-C-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-013.docx) Zurich Univ., Charité Berlin

[Nicolas Langer presented]

It was explained that: psychiatric disorders are among the most common and debilitating illnesses across the lifespan and begin usually prior to age 24, which emphasizes the need for increased focus on studies of the developing brain. The majority of existing studies have focused on differentiating between children with an isolated psychiatric disorder and typically developing children. However, this line of research does not reflect the real-life situation (over 75% of children with a clinical diagnosis have multiple psychiatric disorders), in which a clinician has the task to choose between different diagnoses and/or the combination of multiple diagnoses (multimorbidity). Furthermore, most of the previous studies employ traditional univariate statistics on relatively small samples. Multivariate machine learning/AI approaches have a great potential to overcome the limitations of this approach. The present proposal offers a unique large-sample dataset that provides a wide array of different psychiatric developmental disorders. The goal is to classify the multimorbidity of children and adolescents based on resting electroencephalography (EEG), demographics, and cognitive behavioral data. Authors believe that a community driven effort to derive predictive markers from these data using advanced AI algorithms can help to improve the diagnosis of psychiatric developmental disorders.

Current methods focus on one diagnostics, while 70% of cases have co-morbidity. Focus in EEG, demographics and cognitive data rather than MRIs because the latter are usually very expensive to run for screening purposes.

Annotations producing by a consensus multidisciplinary team (doctors, psychiatrists, etc.)

The FG accepted Psychiatry as a new FG topic, coordinated by Nicolas Langer (Zurich Univ., Charité Berlin). The FG also requested external validation for review by the FG.

[C-017-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-017-R1.docx) WatIF Health & IEPH/Institutes of Epidemiology & Public Health

[Benjamin Muthambi presented, remotely]

This document describes the WatIFHealth-IEPH partnership’s use-case for incorporation of Artificial Intelligence/AI-assisted clinical decision support system (DSS) modules in Electronic Health Record (EHR) systems implementable in low-middle income countries (LMICs) and resource-constrained settings towards improvement of primary health care. Specifically, the use of machine learning (ML) to improve Cardiovascular Disease (CVD) risk prediction as current standards of practice rely on less accurate CVD risk scoring tools/calculators used to inform selection of appropriate clinical management strategies for type 2 diabetes. This is a revision of the Meeting B submission.

The FG accepted Cardiovascular Risk Prediction using Machine Learning as a new FG topic, coordinated by Benjamin Muthambi (IEPH, USA).

[C-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-022.docx) Baidu

[Presented by Yanwu Xu]

Proposes work on retinopathy, several categories.

Annotation by several ophthalmologists. About 1200 annotated images.

Can provide public data, private date is not available; they have a public research platform.

What are the camera specs? Canon 1600x1600; 2100x2000. Size of sample: 30000 and 10000.

Makes sense to combine data from different sources.

Resolution is not so much of an issue. Field of view and optics are more important.

Screening not diagnosis, so only using images (not pressure).

[C-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-021.docx) Xiangya Hosp. Central S. Univ.

[Presented by Weihong Huang]

Dermatological disease needs to be complemented by specific questions that need to be asked to patients in order to better classify (unusual questions for which information would not be volunteered by the patient), in addition to images. Common problem is also quality of image. There is a minimum image quality baseline, would not work on all smartphones. Currently the tools are not autonomous, but complement normal practice, not all aspects of the diagnosis procedure. Eventually we will get there, but now it is "doctor plus AI".

Work on six types of diseases, inter alia melanoma.

Not clear in the document: What information / data can we get; what is the classification?

Working to open parts of their dataset.

Maria and Huang will discuss combining this application with topic area on Diagnosing skin lesions through imagery analysis.

[C-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-023.docx) ICMR (India), NICF (DoT, India)

[Presented by Manjula Singh]

It was explained that: In 2017, 27% of the estimated 10 million global Tuberculosis (TB) cases developed in India. In the past few years, India has been actively implementing multiple strategies for reducing the burden of TB, including the web-based reporting system, the national TB prevalence survey, and the rollout of TB service delivery from all HIV clinics. An early adoption of Computer Assisted Diagnosis (CAD) systems based on artificial intelligence (AI) technologies for TB detection in India will synergize with the current endeavours to close the gap in TB control and will help global fight against TB and use of AI in the field of population health. This proposal proposes development of AI tool for radiographic detection and screening of TB.

Dataset: x-ray images coming from 15 health centres in India, used for machine learning.

Inputs: X-day images.

Output: Annotations

This is a very important and promising area and it was agreed to create a new topic area led by Manjula Singh.

[C-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-025.docx) Your.MD

[Jonathon Carr-Brown presented, remotely]

Proposal for a topic that fits within the existing topic area for symptom checkers. Your.MD will join ADA to work in the topic area; all other interested parties are invited to join.

It is important to use natural language processing to allow people to express themselves using simple language, not pre-defined scripts.

Your.MD will collaborate with ADA to progress topic area on

# Topic areas

Three new topic groups were established at this meeting, in addition to the eight that were created in Meeting B:

* Cardiovascular Risk Prediction
* Tuberculosis detection
* Psychiatry

After the discussions at this meeting, it was decided to name the existing and new topic areas as follows:

| Topic group | References | Leader |
| --- | --- | --- |
| Cardiovascular disease risk prediction | FGAI4H-C-017-R1 WatIF Health / IEPH | Benjamin Muthambi |
| Classifying autism through analysis of brain imagery | B-018 Columbia University | Jongwoo Choi |
| Dermatology | FGAI4H-C-015 Fraunhofer Portugal, FGAI4H-C-021 Xiangya Hosp. Central S. Univ. | Maria Vasconcelos |
| Falls among the elderly | FGAI4H-C-014 Fraunhofer AICOS | Inês Sousa |
| Histopathology | FGAI4H-C-018 Charité Berlin et al | Frederick Klauschen |
| Neuro-cognitive diseases | FGAI4H-C-020 UNIL, CHUV (Alzheimers) | Marc Lecoultre |
| Ophthalmology (retinal imaging diagnostics) | FGAI4H-C-026-R1, FGAI4H-C-022 Baidu | Arun Shroff |
| Psychiatry | FGAI4H-C-013 Zurich Univ., Charité Berlin (Paediatric) | Nicholas Langer |
| Snakebite and snake identification | FGAI4H-C-012-R1 University of Geneva | Rafael Ruiz de Castañeda |
| Symptom assessment | FGAI4H-C-019 Ada Health, FGAI4H-C-025 Your.MD | Henry Hoffmann |
| Tuberculosis | FGAI4H-C-023 ICMR (India), NICF (DoT, India) | Manjula Singh |

[When reaching out, it may help to add the term "*AI*" to the topic titles. *AI for* cardiovascular disease risk prediction, Classifying autism through *AI-based* analysis of brain imagery*, AI for* dermatology, *AI to prevent* falls among the elderly, *AI for* histopathology, *AI against* neuro-cognitive diseases, *AI for* ophthalmology (retinal imaging diagnostics), *AI for* psychiatry, *AI for* snakebite and snake identification, *AI-based* symptom assessment, *AI against* tuberculosis.]

What are the tasks expected for the topic area coordinators/leaders?

* Develop call for participation specific to the topic area based on the template in C-107 [Timeline: 3 weeks after the C meeting 🡪 18 Feb 2019]
* Prepare TDDs using the ToC in C-105.
* Organize discussions before the next meeting, e.g. e-meetings. Guidelines for operation will be issued shortly after the meeting.

# Review of FG objectives and working methods

In view of the discussions during the meeting, the FG chairman presented a PowerPoint document with a summary of the goals of the FG, structures and processes. A long discussion ensued, with questions and answers on the various aspects.

The document, reviewed as a result of the discussions, is found in [C-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-028.pptx). It is expected that this document will be updated as more operational experience is gained.

# Draft calls

## Call for AI solutions

The preparation of a draft call for AI solutions will be addressed at the next meeting.

## Benchmarking platforms

Two aspects:

* Need to identify a trusted infrastructure to provide the storage and computing capability to run the benchmarks, e.g. UN ICC
* The platform to run the benchmarks need to be identified and a draft call for software platform systems has been prepared, as found in [C-106](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-106.docx).

It was noted that there will be an interdependency

## Template for call for topic group participation

An initial text for a Call for topic group participation was presented. This is an evolution of the call for proposals aiming at increasing the number of stakeholders contributing to the different topic areas. This draft is found as [C-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-107.docx).

Granularity of topic groups:

* Depend on what we need now and what we need in the future.
* Makes sense in the beginning to keep it wide, to increase the number of participants. Within those, different benchmarks (e.g. for specific clinical tasks – precise input and output).
* Chaired by competent people and attended by competent experts. Create a community around a topic to develop specific benchmarks for specific sub-topics with data (AI/ML) experts and health/medical experts. Needs to map back to a taxonomy for WHO purposes.

## Topic description document

[C-030](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-030.docx) Suggestion for a generic topic description document (TDD) outline

This document was prepared to try to structure documents describing the FG work on topic areas.

It was noted that call for topic areas should be kept concise (maximum of 1-2 pages), while TDDs would be comprehensive documents with the major work item descriptions relating to a topic area.

After discussions, C-030-R1 was prepared.

# Future meetings

Document [C-003](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-003.docx) contains the list of existing meetings.

In [C-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-024.docx) (India) has an offer to host the meeting in New Delhi, India, in November (Meeting G), venue and final details will provided later (in principle Tue - Fri), the group gratefully accepted the offer.

Still looking for a host for meeting F in September 2019.

Next meeting (meeting D) in Shanghai, 2-5 April 2019.

Meeting E is planned to take place in Geneva, with the fifth Workshop on Artificial Intelligence for Health on 29 Wednesday 2019 and the FG meeting being held on 30 May – 1 June 2019, collocated with the ITU event “AI for Good Global Summit” 28-31 May 2019.

The updated list of future meeting is found in [C-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-102.docx).

# Outcomes of this meeting

The following (draft) call-related documents were agreed with a 3 week editing period:

* Template for topic-area specific call for participation (including call for data)
* Call for participation for the existing topic areas
* Call for benchmarking software

New topic areas:

* Cardiovascular disease risk prediction – topic driver: Benjamin Muthambi (IEPH, USA)
* Tuberculosis – topic driver: Manjula Singh
* Psychiatry – topic driver: Nicholas Langer

Calls:

* Call for participation in topic groups

Updated documents:

* [C-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-103.docx) – Updated FG-AI4H data acceptance and handling policy
* [C-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-104.docx) - Updated thematic classification scheme (ref: [C-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-027.docx))

Some terms like Optimization and Perception would need further development.

# Closing

Thanks to the host, excellent facilities. Great thanks was expressed to EPFL and the Swiss government for hosting and in particular to Ms Beatrice Scarioni.

Hoping to see everyone in Shanghai.

Annex A:  
Documentation

| Name[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:) | Title[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:)https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40 | Source[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:)https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40 | Created | Note |
| --- | --- | --- | --- | --- |
| [FGAI4H-C-001-R5](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-001-R5.docx) | Proposed agenda of the third meeting ("Meeting C") of the Focus Group on Artificial Intelligence for Health (FG-AI4H) | Chairman FG-AI4H | 2019-01-16 |  |
| [FGAI4H-C-002](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-002.pptx) | Workshop summary | Chairman FG-AI4H | 2019-01-22 |  |
| [FGAI4H-C-003-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-003-R1.docx) | Future meetings – draft plan (save the dates) | Chairman FG-AI4H | 2019-01-21 |  |
| [FGAI4H-C-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-004.docx) | Progress report: AHG Data handling and data acceptance | Co-convenors AHG | 2019-01-15 |  |
| [FGAI4H-C-010-R](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-010-R2.docx)2 | Documentation for the FG-AI4H meeting C (Lausanne, 23-25 Jan. 2019) | TSB | 2019-01-21 |  |
| [FGAI4H-C-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-011.docx) | Updates on brainstorming - Data handling policy | Marc Lecoultre (Business Investigation) | 2019-01-08 |  |
| [FGAI4H-C-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-012.docx) | Status report: Guiding anti-venom selection with snake-identification imagery analysis | University of Geneva | 2019-01-16 |  |
| [FGAI4H-C-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-013.docx) | Prediction of psychiatric multimorbidity in a large pediatric sample | University of Zurich, Charité Berlin | 2019-01-24 |  |
| [FGAI4H-C-013-A1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-013-A1.docx) | Att.1 - Presentation - Prediction of Psychiatric Multimorbidity in a Large Pediatric Sample | University of Zurich, Charité Berlin | 2019-01-16 |  |
| [FGAI4H-C-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-014.docx) | Status Report of: Reducing risk of falling among elderly | Fraunhofer AICOS | 2019-01-16 |  |
| [FGAI4H-C-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-015.docx) | Status report of B-025 Teledermatological Screening Solution via Mobile Devices | Associação Fraunhofer Portugal Research | 2019-01-16 |  |
| [FGAI4H-C-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-016.docx) | Proposal to add new thematic classifications | Chongqing University | 2019-01-16 |  |
| [FGAI4H-C-017-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-017-R1.docx) | AI for Health Use-Case: Demonstration of Applicability of Cardiovascular Risk Prediction using Machine Learning & Routine Patient Data Across Diverse Populations: A Standards-Setting Approach | WatIF Health & IEPH/Institutes of Epidemiology & Public Health | 2019-01-18 |  |
| [FGAI4H-C-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-018.docx) | Annotation of histopathology images and benchmarking of AI solutions for the use case "machine learning-based profiling of tumor-infiltrating lymphocytes in breast cancer" | Institute of Pathology, Charité Universitätsmedizin Berlin, Berlin Institute of Health & Berlin Big Data Center, Berlin Center for Machine Learning, Technische Universität Berlin, Singapore University of Technology and Design, TIL international working gr | 2019-01-16 |  |
| [FGAI4H-C-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-018-A1.docx)-A1 | Att.1 - Presentation - Machine learning-based profiling of tumor-infiltrating lymphocytes in breast cancer | Charité Berlin | 2019-01-24 |  |
| [FGAI4H-C-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-019.docx) | Status report on the “Evaluating the accuracy of ‘symptom checker’ applications” use case | Ada Health | 2019-01-17 | late |
| [FGAI4H-C-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-020-R1.docx)-R1 | Status report for Alzheimer’s disease use case | Laboratory for Research in Neuroimaging, Department of Clinical Neurosciences, Faculty of Biology and Medicine, UNIL Centre Hospitalier Universitaire Vaudois (CHUV) | 2019-01-17 | late |
| [FGAI4H-C-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-020-A1.docx)-A1 | Att.1 - Presentation - Testing the clinical validity of machine learning-based diagnostics for Alzheimer’s disease | CHUV | 2019-01-24 |  |
| [FGAI4H-C-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-021.docx) | Proposal to set up a project on AI skin diseases detection | Xiangya Hospital Central South University | 2019-01-18 | late |
| [FGAI4H-C-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-022.docx) | Proposal to set up a project on AI Retinal Image analysis | Baidu | 2019-01-18 | late |
| [FGAI4H-C-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-023.docx) | Development of AI tool for radiographic detection and diagnosis of TB | ICMR (India), NICF (DoT, India) | 2019-01-18 | late |
| [FGAI4H-C-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-024.docx) | Hosting of the 6th meeting of the ITU-T FG AI4H in India in the Fall of 2019 | ICMR (India), NICF (DoT, India) | 2019-01-20 | late |
| [FGAI4H-C-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-025.docx) | Clinical Evaluation of AI Triage and Risk Awareness in Primary Care Setting | Your.MD | 2019-01-22 | late |
| [FGAI4H-C-02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-026-R1)6-R1 | Proposal: Using AI for early detection of Diabetic Retinopathy to prevent vision loss | Arun Shroff | 2019-01-23 | late |
| [FGAI4H-C-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-027.docx) | Updated draft thematic classification scheme | FG-AI4H | 2019-01-24 |  |
| [FGAI4H-C-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-028.docx) | Structure and Goals of FG-AI4H | Chairman FG-AI4H | 2019-01-25 |  |
| [FGAI4H-C-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-029.docx) | Call for Topic Group Participation | FG-AI4H Management | 2019-01-25 |  |
| [FGAI4H-C-030](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-030.docx) | Suggestion for a generic topic description document (TDD) outline | Ada Health | 2019-01-25 |  |
| [FGAI4H-C-031](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-031.docx) | Draft for a call for proposals of open-source software that enables the FG-AI4H to run the benchmarking procedure on computing infrastructure of the United Nations | Chairman WG Operations | 2019-01-29 | late |
| [FGAI4H-C-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-102.docx) | Schedule of future FG meetings (as of 2019-01-25) | Chairman FG-AI4H | 2019-01-31 |  |
| [FGAI4H-C-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-104.docx) | Updated draft thematic classification scheme | FG-AI4H | 2019-01-25 |  |
| [FGAI4H-C-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-105.docx) | Generic topic description document (TDD) outline | FG-AI4H | 2019-01-31 |  |
| [FGAI4H-C-106](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-106.docx) | Call for proposals of open-source software that enables the FG-AI4H to run the benchmarking procedure on computing infrastructure of the United Nations [similar to challenge platforms from machine learning or data science] | FG-AI4H | 2019-02-06 |  |
| [FGAI4H-C-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-107.docx) | Template for call for topic group participation | FG-AI4H | 2019-02-14 |  |

Annex B:  
Participants

| **Title** | **First Name** | **Last Name** | **Organization** | **Country** | **22-Jan** | **23-Jan** | **24-Jan** | **25-Jan** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mr. | Philip | AbdelMalik | World Health Organization | - |  | Physically | Physically |  |
| Mr. | Manish Kumar | Agarwal | Ministry of Communications | India | Physically | Physically | Physically | Physically |
| Prof. | amara | Amara | Terre des hommes Foundation | Switzerland | Physically |  |  |  |
| Mr. | Pat | Baird | Philips | USA | Physically | Physically | Physically |  |
| MA. | Pradeep | Balachandran | - | Switzerland | Remote | Remote | Remote | Remote |
| Mrs. | Eugenia | Balysheva | Dotphoton | Switzerland |  |  |  |  |
| MA. | Pietro | Bargagli | EPFL | Switzerland |  |  |  |  |
| Mr. | Daniel | Battu | Autorité de Régulation des Communications électron | France | Remote | Remote | Remote | Remote |
| Dr. | Ciara | Bergin | Jules-Gonin Eye Hospital, UNIL | Switzerland |  |  |  |  |
| Dr. | Julia | Binder | Ecole Polytechnique Fédérale de Lausanne | Switzerland | Physically |  |  |  |
| Dr. | Isabelle | Bolon | University of Geneva | Switzerland | Physically | Physically | Physically | Physically |
| Mr. | Patrick | Briand | Novel-T | Switzerland |  |  |  |  |
| Ph.D | Jonathan P | Castro | SolNanoTek SA | Switzerland | Physically | Physically |  |  |
| Dr. | Dingding | Chao | United Nations Office at Geneva |  |  | Physically |  |  |
| Ms. | Sijin | Chen | Xiangya Hospital CSU, Changsha, China |  |  |  |  |  |
| Dr. | Giovanni | Cherubin | Ecole Polytechnique Fédérale de Lausanne | Switzerland | Physically |  |  |  |
| Prof. | Leanne | Currie | University of British Columbia | Canada |  |  |  |  |
|  | Ayda | Dabiri | International Telecommunication Union |  | Physically | Physically | Physically | Physically |
| Dr. | RUCHI | DASS | HEALTHCURSOR IT CONSULTING PVT. LTD., HYDERABAD, India |  |  |  |  |  |
| Mr. | Simão Ferraz | de Campos Neto | International Telecommunication Union |  | Physically | Physically | Physically | Physically |
| Eng. | Gianmarco | Del Bono | AtmosClear | Switzerland |  |  |  |  |
| Dr. | Pasquale | DI CESARE | InnoBoost SA | Switzerland | Physically |  |  |  |
| Ms. | Huguette | Diakabana |  |  |  | Physically | Physically | Physically |
| Dr. | Spiros | Dimolitsas | Georgetown University | USA | Physically |  |  |  |
| Dr. | Christian | Djeffal | Humboldt Institute for Internet and Society | Germany | Physically |  |  |  |
| Mr. | Fahdi | Dkhimi | World Health Organization |  |  |  |  |  |
| Mr. | Andrey | Dobrenkov | Mission permanente de la Fédération de Russie | Russia |  |  |  |  |
| Ph.D. | Jicui | DONG | World Health Organization |  | Remote | Remote | Remote | Remote |
| Dr. | Sarah | ENGLAND | DIY Disease Control Inc. | France | Physically |  |  |  |
| Mr. | HANI | ESKANDAR | International Telecommunication Union |  | Physically |  |  |  |
| Mrs. | MAGALI | ESQUINCA GUZMÁN | Secretaría de Comunicaciones y Transportes | Mexico | Remote | Remote | Remote | Remote |
| Dr. | Freitag | Felix |  | Switzerland | Remote | Remote | Remote | Remote |
| Mrs. | Marie-Valentine | Florin | EPFL | Switzerland | Physically |  |  |  |
| Mr. | Marc | Friedli | EPFL | Switzerland |  |  |  |  |
| MBA | Ada | Gabriela Miranda Moscoso | Mandat International | Switzerland |  |  |  |  |
| MA. | Andrea Romaoli | Garcia | United Nations |  | Remote |  |  |  |
| Ms. | ALESSANDRA | GASPARI | International Telecommunication Union |  | Remote | Remote | Remote | Remote |
| Ms. | Marelize | Gorgens | World Bank Group |  |  |  |  |  |
| Dr. | SAURABH KUMAR | GUPTA | Ministry of Communications | India | Physically | Physically | Physically | Physically |
| Dr. | Stefan | Haufe | TU Berlin | Germany | Remote | Remote | Remote | Remote |
| Dr. | Usha | Helleman | Darwin Digital | Switzerland |  |  |  |  |
| Mr. | Maximilian Wieland | Hofer | Université de Genève | Switzerland |  |  |  |  |
| Mr. | Henry | Hoffmann | Ada Health GmbH | Germany | Physically | Physically | Physically | Physically |
| Dr. | Christophe | Hsu | Global Dermatology | Switzerland | Physically |  |  |  |
| Prof. | Weihong | Huang | Xiangya Hospital Central South University | China | Physically | Physically | Physically |  |
| Prof. | Jean-Pierre | Hubaux | Ecole Polytechnique Fédérale de Lausanne | Switzerland | Physically |  |  |  |
| Prof. | Stephen | Ibaraki | REDDS Capital | Canada | Remote | Remote | Remote | Remote |
| Mr. | BILEL | JAMOUSSI | International Telecommunication Union |  |  |  |  | Physically |
| Prof. | Nigel | Jefferies | Huawei Technologies Co., Ltd. | China |  |  |  |  |
| Ms. | Karin | Jestin | Philanthropic & Humanitarian Initiatives (PHI) | Switzerland | Physically |  |  |  |
| Eng. | Siddhartha | Jha | Fondation Botnar | Switzerland | Physically | Physically |  |  |
| Dr. | Oommen | John | The George Institute for Global Health | India |  |  |  |  |
| Dr. | Indra | Joshi | NHS England | United Kingdom | Physically |  |  |  |
| Mr. | Ravi | Kant | Ministry of Communications | India |  |  |  |  |
| Mr. | AHMED BACAR | KARIM | Ministère des Transports, des Postes et Télécommunication | Comoros |  |  |  |  |
| Dr. | Ferath | Kherif | CHUV | Switzerland | Physically | Physically | Physically | Physically |
| Prof. | Frederick | Klauschen | TU Berlin | Germany |  | Physically | Physically |  |
| Mr. | Erich | Kofmel | Autistic Minority International | Switzerland |  |  |  |  |
| Dr. | Davor | Kosanic | Ecole Polytechnique Fédérale de Lausanne | Switzerland | Physically |  |  |  |
| Dr. | Ramesh | KRISHNAMURTHY | World Health Organization |  |  |  |  | Physically |
| Dr. | Monique | Kuglitsch | Fraunhofer-Institut für Nachrichtentechnik | Germany | Remote | Remote | Remote | Remote |
| Mr. | Andreas | Kühn | Ada Health GmbH | Germany | Physically | Physically | Physically | Physically |
| Mr. | Premjit | Lal | Ministry of Communications | India |  |  |  |  |
| Prof. | Nicolas | Langer | University of Zurich | Switzerland |  | Physically | Physically |  |
| MA. | Gianrocco | Lazzari | EPFL | Switzerland | Physically |  |  |  |
| Mr. | Marc | Lecoultre | Business Investigation |  | Physically | Physically | Physically | Physically |
| Dr. | Naomi | Lee | The Lancet, London | United Kingdom | Physically | Physically | Physically | Physically |
| Ms. | Man | Li | Ministry of Industry and Information Technology | China | Physically |  | Physically |  |
| Mr. | Adrian | Luca | EPFL | Switzerland | Physically |  |  |  |
| Dipl.-Ing. | Markus | Maaß | Federal Network Agency for Electricity, Gas, Telec, MAINZ, Germany |  | Physically | Physically | Physically | Physically |
| Mr. | Aurélien | Macé | FIND | Switzerland | Physically |  |  |  |
| Mrs. | Sophie | Mathey-Debeaumont | Pristem | Switzerland | Physically |  |  |  |
| Ms. | Mythili | Menon | International Telecommunication Union |  | Physically | Physically | Physically | Physically |
| Eng. | Mohamed | Minalla | Garden City College for Science & Technology | Sudan |  |  |  |  |
| Mr. | Heimo | Müller | Mission permanente de l'Autriche | Switzerland | Physically |  |  |  |
| Dr. | Benjamin | Muthambi | WatifHealth | USA | Remote | Remote | Remote | Remote |
| Mr. | Olivier | Naret | EPFL | Switzerland |  |  |  |  |
| Dr. | Andrey | Naumenko | SamanTree Medical SA | Switzerland | Physically |  |  |  |
| MBA | Mohamed | Nour | World Health Organization |  | Physically | Physically | Physically | Physically |
| Mr. | Barrett | Parker | Mission permanente des Etats-Unis d'Amérique | USA |  |  |  |  |
| Eng. | Mahabir | Parshad | Ministry of Communications | India |  |  |  |  |
| Ph.D. | Karell | Pellé | FIND | Switzerland |  |  |  |  |
| Mr. | Pablo | Perel | LSHTM | United Kingdom | Physically |  |  |  |
| Mr. | Evarist | Planet | EPFL | Switzerland |  |  |  |  |
| Dr. | Zrinka | Potocanac | Ericsson Nikola Tesla d.d. | Croatia | Physically | Physically | Physically | Physically |
| Mr. | Sameer | Pujari | World Health Organization |  | Remote | Remote | Remote | Remote |
| Mr. | Apostolos | Pyrgelis | EPFL | Switzerland |  |  |  |  |
| Dr. | Bastiaan | Quast | International Telecommunication Union |  | Physically | Physically | Physically | Physically |
| MA. | Adrian | Quesada Rodríguez | Mandat International | Switzerland |  |  |  |  |
| Dr. | Roxana | Radu | DiploFoundation | Switzerland |  |  |  |  |
| Mr. | Shashank | Rai | United Nations International Computing Centre |  | Physically |  |  |  |
| Dr. | Jean Louis | Raisaro | Lausanne University Hospital | Switzerland | Physically |  |  |  |
| Mr. | Vishnu | Ram Omanakutty Amma Vijayaraghava | Individual | India | Remote | Remote | Remote | Remote |
| Mr. | Mario | Ravic | Ericsson Nikola Tesla d.d. | Croatia | Remote | Remote | Remote | Remote |
| Mr. | Janis | Reinelt | Aicura medical | Germany | Physically | Physically |  |  |
| Mr. | David | Rivollet | EPFL | Switzerland | Remote | Remote | Remote | Remote |
| Ph.D. | Rafael | Ruiz de Castaneda | Université de Genève | Switzerland | Physically | Physically | Physically | Physically |
| Ms. | Anca | Rusu | EPFL | Switzerland | Physically |  |  |  |
| Prof. | Marcel | Salathé | Ecole Polytechnique Fédérale de Lausanne | Switzerland | Physically | Physically | Physically | Physically |
| Dr. | Wojciech | Samek | Fraunhofer HHI | Germany | Physically | Physically | Physically | Physically |
| Ms. | Leena | Sankla | Solutions 4 Health | United Kingdom | Physically | Physically |  |  |
| Mr. | Keshav | Sankla | Solutions 4 Health | United Kingdom | Physically | Physically |  |  |
| Dr. | Petar | Scepanovic | EPFL | Switzerland |  |  |  |  |
| Dr. | Klaus | Schönenberger | EPFL | Switzerland | Physically |  |  |  |
| Mr. | Johannes | Schröder | Ada Health GmbH | Germany | Physically | Physically |  |  |
| Ms. | Anita | Shah | World Health Organization |  |  |  |  |  |
| Mr. | Arun | Shroff | MedIndia, Old Bridge | USA | Physically | Physically | Physically | Physically |
| Mr. | Nao | Sipula | Watif Health IIC, BENONI | South Africa | Physically | Physically | Physically | Physically |
| Mr. | Andrej | Sobkowski | Pristem | Switzerland | Physically |  |  |  |
| Dr. | Foti | Sofiadellis | Royal Australasian College of Surgeons | United Kingdom | Remote | Remote | Remote | Remote |
| Ph.D | Inês | Sousa | Associação Fraunhofer Portugal Research | Portugal |  |  |  |  |
| Ms. | Lara | SRIVASTAVA | International Telecommunication Union |  |  | Physically | Physically | Physically |
| Mr. | Shabbir | Syed Abdul | Indian association of medical informatics | India | Physically |  |  |  |
| Mr. | Steffen | Tengesdal | BAO Systems | USA | Physically |  | Physically | Physically |
| Dr. | Eva | THELISSON | AI Transparency Institute | Switzerland |  | Physically |  |  |
| Dr. | Christopher | Tse | EPFL | Switzerland |  |  |  |  |
| Ms. | Maria | Vasconcelos | Associação Fraunhofer Portugal Research | Portugal | Remote | Remote | Remote | Remote |
| Mrs. | JINGYU | WANG | Baidu | China |  |  |  |  |
| Ms. | Jingyu | WANG | Tsinghua University | China |  |  |  |  |
| Ms. | Katherine | Ward | World Bank Group |  | Physically | Physically |  |  |
| Mr. | Markus | Wenzel | Fraunhofer-Institut für Nachrichtentechnik | Germany | Physically | Physically | Physically | Physically |
| Ms. | Alina | Wernick | Humboldt Institute | Germany | Physically | Physically |  |  |
| Prof. | Thomas | Wiegand | Fraunhofer-Institut für Nachrichtentechnik | Germany | Physically | Physically | Physically | Physically |
| Eng. | Shan | Xu | Ministry of Industry and Information Technology | China | Physically | Physically | Physically | Physically |
| Prof. | Yanwu | Xu | Baidu | China | Physically | Physically | Physically | Physically |
| Dr. | Wei | Zhang | World Health Organization |  | Physically |  |  |  |
| Eng. | Yajun | Zhang | Tencent Technology (Shenzhen) | China |  |  |  |  |
| Dr. | Daidi | Zhong | Chongqing University | China | Physically | Physically | Physically | Physically |
|  | Enga | Luye | Belair Biotech |  | Physically | Physically | Physically | Physically |
|  | Christopher | Tse | Wellcome Trust | United Kingdom | Physically |  |  |  |
|  | Marc | Friedli | Health2030 |  | Physically |  |  |  |
|  | Alessia | Magliarditi | International Telecommunication Union |  | Physically | Physically | Physically | Physically |
|  | Alexandre | Cuenat | Wellcome Trust | United Kingdom | Remotely | Remotely |  |  |
|  | Imad | Riachi | Startup |  | Physically |  |  |  |
|  | Siju | Chen |  |  |  |  |  |  |
|  | Manjula | Singh | Indian Council of Medical Research | India |  |  | Physically | Physically |
|  | Kaoru | Mizuno | International Telecommunication Union |  |  | Remote |  |  |
|  | Eun-Kyeong | Kim |  |  | Remote | Remote | Remote | Remote |
|  | Nicola | Amoroso |  |  | Remote | Remote | Remote | Remote |
|  | Philippe | Zitoun |  |  | Remote | Remote | Remote | Remote |
|  | Jonathon | Carr-Brown | Your.MD | United Kingdom | Remote | Remote | Remote | Remote |
|  | Matteo | Berlucchi | Your.MD | United Kingdom | Remote | Remote | Remote | Remote |

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