

IMT-2020 / CAICT / oppo / vivo

## Wireless Communication AI Competiton (WAIC) 2nd

*AI enlightens wireless communication*

Host -- IMT-2020(5G) Promotion Group 5G+AI Work Group

Organizer -- China Academy of Information and Communications Technology  
Guangdong OPPO Mobile Telecommunications Corp., Ltd  
vivo Mobile Communication Co., Ltd.

Competition platform -- DataFountain



# Wireless Communication AI Competition

2021/7/5 – 2021/8/27

**Host -** IMT-2020(5G) Promotion Group 5G+AI Work Group

**Organizer -** China Academy of Information and Communications Technology  
Guangdong OPPO Mobile Telecommunications Corp., Ltd  
vivo Mobile Communication Co.,Ltd

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## ■ COMPETITION BACKGROUND

5G+AI has become the most popular research area for the development of wireless communications. Competition becomes an unprecedented way to promote the integration of 5G and AI by involving academic and industrial R&D to solve typical wireless problems with AI/ML tools.

The 5G+AI Work Group of IMT-2020 (5G) Promotion Group is committed to conduct research on the requirements, theories and technologies of deep integration of 5G and AI, and promote the international standardization and industrialization process of 5G and AI integration.

**Wireless Communication AI Competition (WAIC)** is hosted by The 5G+AI Work Group of IMT-2020 (5G) Promotion Group for researchers to contribute on the integration of wireless communications and AI, with the theme of "AI Enlightens Wireless Communication". A continue influence is expected for the WAIC to attract academic and industry contribution to the integration of 5G and AI

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## ■ COMPETITION TRACK IN THE 2<sup>nd</sup> WAIC

**Track 1: AI-based Channel State Information Feedback**

**Track 2: AI-based Channel Estimation**

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## ■ COMPETITION SCHEDULE

The competition will be held online, and technology sharing and awarding will be carried out offline. Contestants should register, team up, and submit the model for evaluation on the official platform DataFountain. After the online competition, the top ten teams or individuals whose submitted models have been reviewed need to participate in the seminar and attend the award ceremony.

The schedule is as follows:

- **June 24, 2021:** The competition tasks are released, contestants can log in to the official website for registering:

<https://www.datafountain.cn/special/IMT-2020-2/competition?lang=en-US>

- **July 5, 2021:** The dataset is released. Contestants can log in to the official website to download the dataset. At the same time, the competition officially enters the evaluation stage. Players can submit the model files online to the competition platform. Each team can submit up to 5 times a day. The evaluation system will

automatically evaluate the score.

- **August 24, 2021 12:00 (Beijing time):** Deadline for registration and team formation.
- **August 27, 2021 24:00(Beijing time):** The evaluation platform is closed, and the score list is locked.
- **August 28-September 10, 2021:** After reviewing the models of the top ten teams, the teams will be awarded the Golden, Silver, Bronze and the Winning prize in descending order of the evaluation results. The winning teams must participate in the seminar and the award ceremony. Teams that do not participate will abandon the competition by default.

Note: After receiving the notification from the organizing committee, if the top ten teams fail to submit their materials or abandon the competition, the organizing committee will notify other teams to submit review materials based on the ranking.

- **September 29-September 30, 2021 [to be confirmed]:** Seminar and award ceremony.

Note: if the time is changed due to force majeure or other factors, the organizing committee will notify the winning teams as soon as possible. If the winning team is from outside of China, online access is recommended for participating in the seminar and the award ceremony.

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## ■ Irregularities

If the participating team has the following or other major irregularities, the qualifications and results of the competition can be cancelled after the discussion of competition organizing committee, and the list of winning teams will be postponed sequentially.

- a. Serious violation of competition rules,
  - b. Cheating by using multiple accounts, colluding, plagiarizing others' codes, etc.,
  - c. Use of external data without permission,
  - d. Other major violations.
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## ■ Bonus

<b>Golden Prize:</b>	<b>300,000 RMB</b>	<b>for 1 team</b>
<b>Silver Prize:</b>	<b>50,000 RMB (per team)</b>	<b>for 2 teams</b>
<b>Bronze Prize:</b>	<b>20,000 RMB (per team)</b>	<b>for 3 teams</b>
<b>Winning Prize:</b>	<b>10,000 RMB (per team)</b>	<b>for 4 teams</b>

Note 1– the award can be settled in US dollars according to the exchange rate on the settlement date

Note 2– the individual income tax or other forms of tax on the bonus will be borne by the winners, and will be withheld and paid by the organizer of the competition. The participating teams shall be responsible for the distribution and distribution of the bonus among their members, and the organizer will not be held responsible for this.

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## ■ COMPETITION RULES

- **Participants:** The competition is open to all the people around the world, regardless of age or nationality. All colleges and universities, scientific research institutions, enterprises, maker teams, individuals, etc. can log on to the official website to register for the competition. Employees of China Academy of Information and Communications Technology, Guangdong OPPO Mobile Telecommunications Corp., Ltd, vivo Mobile Communication Co., Ltd. and affiliated units of above can participate the competition but cannot win prizes, and will not occupy the prize quota (i.e. if the team is in the top 10 of the rank after the rank is locked, the team will not be awarded, nor will it occupy the award quota. The team can participate in sharing activities. The winning team will be ranked in sequence except for this team).
- **Registration requirements:** Each person can only participate in one team (1-5 team member per team(s)) for each track. All team members must provide basic personal information and pass the real-name certification when registering the competition. The team formation must be completed before the deadline. Once the formation of the team is completed, team members cannot quit from the team.
- **Team up conditions:** In order to ensure that each team has a relatively equal opportunity for submission, the total number of submissions of all members in a team must be no larger than 5 times of the number of days open for evaluation.
- **Submission of works:** Contestants can submit up to 5 works per day on the competition platform, and the evaluation system will automatically evaluate the score. Entries must guarantee originality, do not violate any relevant laws of the People's Republic of China, and do not infringe any third-party intellectual property rights or other rights. Once

discovered or submitted and verified by the right holder (within 1 month after the publishing of final winner list of the competition), the committee will cancel its competition results and deal with it seriously.

- **Winning conditions:** The top 10 teams on the list at the end of the online evaluation will be the winning teams. If any team quits the competition (the committee failed to contact any member of the team for three consecutive days according to the contact information provided by the contestants, or the team took the initiative to quit the competition), the list of winners will be filled with following teams by sequence. Contestants need to cooperate with the committee to verify the validity and authenticity of the submitted competition works, and at the same time check the correctness of the works by themselves, and submit them after confirming that they are correct. The committee is not responsible for making changes and adjustments to the submitted competition works.
- **Fair competition:** Participants are not allowed to use rule loopholes or technical loopholes to improve their rankings outside the scope of the designated assessment technical ability, and it is forbidden to copy other people's works, exchange answers, and use multiple IDs in the competition. The committee will cancel its competition results and deal with it seriously.
- **Organization statement:** The committee reserves the right to adjust and modify the rules of the competition, the right to determine and dispose of cheating in the competition, and the right to withdraw or refuse the award of the participating team that affects the organization and fairness.
- **Competition data:** The committee authorizes participants to use the provided data to conduct model training for the designated contest. Participants are not allowed to use the data for any commercial purposes. If it is used for scientific research, please indicate the relevant data provider.
- **Intellectual property rights of works:** The intellectual property rights of the works (including but not limited to algorithms, models, etc.) belong to the contestants. The committee can use the works, works-related materials, and participating team information for promotional materials and related publications, e.g. designated and authorized media releases, official website browsing and downloads, exhibitions (including touring exhibitions) and other activities, under the consent of the contestants. The organizers of the competition have the priority of cooperation.
- **Special avoidance:** Personnel involved in track design and data provision in China Academy of Information and Communications Technology, Guangdong OPPO Mobile Telecommunications Corp., Ltd, and vivo Mobile Communication Co., Ltd are prohibited from participating, or entrusting others to participate or guiding the participating team.
- **Notification and communication:** The committee will invite teams to participate in sharing seminar, awards ceremony and other activities through the contact information reserved by the participating teams. If the participating team does not reply within 3 days after the above-mentioned related notice is issued, it will be deemed to have

automatically given up the corresponding opportunity, and the organizer has the right to replace other participating teams in order.

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## ■ Rights and Responsibilities

- The committee has the right to judge and dispose of cheating in the competition.
- The organizing committee reserves the right to modify the submission deadline, defense date and awards date of the competition works. The organizing committee reserves the right to suspend or terminate the competition under special conditions.
- The organizing committee reserves the right to withdraw or refuse awards to participating teams that affect the organization and fairness of the competition.
- In case of data update, review code update, cheating check and other reasons, the committee has the right to re-evaluate the results of the competition and update the rankings.
- The committee reserves the right to adjust and modify the rules of the competition. The organizers of the competition have the final right to interpret the competition.

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## ■ Organization

<b>Host -</b>	IMT-2020(5G) Promotion Group 5G+AI Work Group
<b>Organizer -</b>	China Academy of Information and Communications Technology Guangdong OPPO Mobile Telecommunications Corp., Ltd vivo Mobile Communication Co.,Ltd
<b>Secretariat -</b>	China Academy of Information and Communications Technology Guangdong OPPO Mobile Telecommunications Corp., Ltd National Mobile Communications Research Laboratory of Southeast University
<b>Platform -</b>	DataFountain

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## ■ Committee

### Chairman –

Zhiqin Wang Vice President of CAICT, Chair of IMT-2020(5G) Promotion Group

Ning Yang Head of the OPPO Standard and Research Department

Fei Qin          President of the vivo Communications Research Institute  
Shi Jin          Executive Vice President of Graduate School of Southeast University

**Vice Chairman –**

Leader and Deputy-Leader organizations of IMT-2020(5G) Promotion Group 5G+AI:

Xiaofeng Liu    Jia Shen    Liang Liu    Xiaobo Wu.

**Committee member –**

(List is sorted by the first letter of the name)

Bin Xia	Professor of Shanghai Jiao Tong University
Bo Ai	Professor of Beijing Jiaotong University
Caijun Zhong	Professor of Zhejiang University
Chao Wang	Associate professor of Tongji University
Chungang Yang	Professor of Xidian University
Jie Zeng	Senior Engineer of Tsinghua University
Jing Guo	Special researcher of Beijing Institute of Technology
Li Chen	Associate Professor of University of Science and Technology of China
Lingyang Song	Professor of Peking University
Mugen Peng	Professor of Beijing University of Posts and Telecommunications
Qin Huang	Professor of Beihang University
Tao Yang	Associate Professor of Fudan University
Yong Xiao	Professor of Huazhong University of Science and Technology
Yunjian Jia	Professor of Chongqing University



## ■ Contact

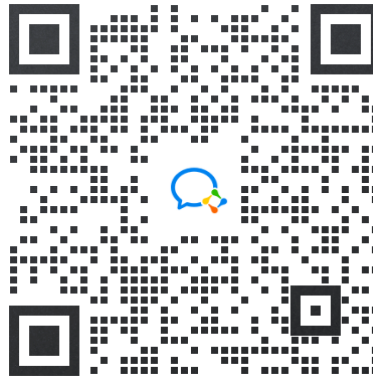
Tel: 010-62381637

Email: [liujia@datafountain.cn](mailto:liujia@datafountain.cn)

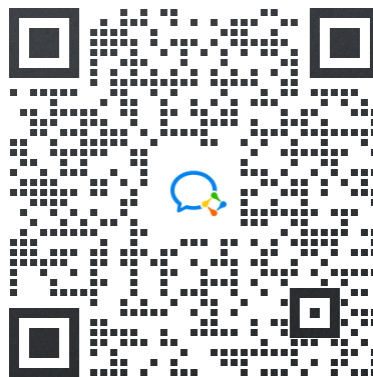
Community:

Official WeChat Communication Group:

Group 1: 2021-WAIC-AI based CSI Feedback



Group 2: 2021-WAIC-AI based Channel Estimation





## **Track 1: AI-based Channel State Information Feedback**

**Organizer: CAICT OPPO**

### **Background**

Accurate channel estimation (CE) and effective channel state information (CSI) feedback are the basic conditions to ensure the performance of wireless communication system, and will be the core topic of the 2<sup>nd</sup> Wireless Communication AI Competition. Track “AI-based Channel State Information Feedback” mainly aims at CSI compression and feedback problems, and constructs the corresponding competitive theme.

Currently, there are two ways to handle the problem of CSI compression and feedback. One is the feedback of the whole channel information, the other is the compression and feedback after channel feature extraction. In the 1<sup>st</sup> Wireless Communication AI Competition, contestants competed fiercely for the full channel information feedback, and achieved good results during the competition. In the 2<sup>nd</sup> Wireless Communications AI Competition, the compression and feedback after channel feature extraction will be addressed and explored. On the one hand, in the discussion of 3GPP, the solution of CSI feedback is based on the compression and feedback of the extracted channel information. The design and application of 5G system are all around this kind of solution. Therefore, while exploring the problem of full channel information feedback based on AI, it is necessary to carry out researches on channel state information compression and feedback based on AI in parallel. In addition, the research of channel state information feedback based on AI can also achieve more equal and direct fair comparison with the feedback mechanism based on TYPE1 and TYPE2 codebook in the existing 5G system, and provide direct quantitative performance comparison and analysis for channel state information feedback.

### **Task**

In this competition, we consider to make use of the information compression performance of AI, treat the channel feature information as the information to be compressed, and recover the information at the receiving side, so that the base station can adjust the corresponding

parameters and make the best data scheduling scheme.

Specifically, the characteristics of this competition are as follows:

- a. Through the information compression and feedback based on AI, the whole channel information obtained by the UE side is extracted and fed back to the network side to make reasonable data scheduling according to the channel conditions.
- b. Based on the basic requirements of wireless communication, this competition focuses on the feedback performance of channel state information under different feedback overhead in a complex channel environment.
- c. The model design with 48bit feedback vector and 128bit feedback vector are required for this track under the given channel data set. The above 48bit feedback vector and 128bit feedback vector correspond to low feedback-bit scenario and high feedback-bit scenario respectively. The final score of the track is obtained by weighting the scores of the two scenarios.

## **Dataset**

A full channel data set is generated under the MIMO channel environment of 32 transmitting antennas and 4 receiving antennas (32T4R). At the same time, in order to consider both feedback accuracy and feedback overhead, the data set is divided into 12 subbands within the transmission bandwidth to construct the corresponding channel feature information as the data set for the competition.

Note that the contestants can handle the data independently or jointly with multiple subbands, as long as the submission interface is consistent with the requirements of the competition.

The competition data comes from the MIMO channel feature information of the 32T4R of multi-cell and multi-user, and the data is provided through the W\_32T4R.mat file. The number of data samples is 600000, each sample size is 768, in which each sample is composed of 12 subbands channel feature information, each subband channel feature information is composed of 32-length channel feature vectors, arranged in the order of  $12 \times 32 \times 2$ , which correspond to 12 subbands, the eigenvector of 32 length, the real part and the imaginary part.

Note: The competition does not allow the use of external data sets. After the evaluation, the team to be awarded should explain the training process in the work review stage, and repeat

the training process if necessary.

## Result Submission

Contestants should design the model according to the following rules, and upload the zip package of the model to the scoring system of the competition platform.

Recommended programming language version: Python 3.6,

Recommended package version: tensorflow 2.1.0, pytorch > 1.0.0, Numpy 1.18.1, matplotlib 3.1.2, h5py 2.10.0, Sklearn 0.23.2

Maximum upload file size: 200MB

The scoring system supports the submission of model using TensorFlow or Pytorch. We provide the templates of both as baseline for reference. Both versions provide modelTrain.py and modelDesign.py, where

- modelTrain.py: for model constructing and training. The training data address is set as `‘./channelData/W_test.mat’`, and the model saving address is set as `‘./modelSubmit/*.h5’` (for Tensorflow) or `‘./modelSubmit/*.pth.tar’` (for PyTorch).
- ModelDesign.py: for model designing. The ‘Encoder’ function defines the transmitter model, where the input and output are the eigenvectors of multiple subbands for full bandwidth and the feedback bit stream, respectively. The ‘Decoder’ function defines the receiver model, where the input and output are the feedback bit stream and reconstructed eigenvectors of multiple subbands for full bandwidth. Moreover, ‘Encoder’ and ‘Decoder’ are integrated into an autoencoder model and participant can redesign the ‘Encoder’ and ‘Decoder’ models to improve score;

Files need to be submitted:

1. modelDesign\_48.py

encoder\_48.h5 (for TensorFlow) or encoder\_48.pth.tar (for Pytorch)

decoder\_48.h5 (for TensorFlow) or decoder\_48.pth.tar (for Pytorch)

2. modelDesign\_128.py

encoder\_128.h5 (for TensorFlow) or encoder\_128.pth.tar (for Pytorch)

decoder\_128.h5 (for TensorFlow) or decoder\_128.pth.tar (for Pytorch)

### [Submission Example]

For TensorFlow: Zip the files with the following structure, name the zip package with [submit\_tf] and upload it, i.e.,

submit\_tf.zip

```
└─ submit_tf (folder)
    ├── modelDesign_48.py
    └─ modelDesign_128.py
        └─ modelSubmit (folder)
            ├── encoder_48.h5
            ├── decoder_48.h5
            ├── encoder_128.h5
            └─ decoder_128.h5
```

For Pytorch: Zip the files with the following structure, name the zip package with the [submit\_pt] and upload it, i.e.,

submit\_pt.zip

```
└─ submit_pt (folder)
    ├── modelDesign_48.py
    └─ modelDesign_128.py
        └─ modelSubmit (folder)
            ├── encoder_48.pth.tar
            ├── decoder_48.pth.tar
            ├── encoder_128.pth.tar
            └─ decoder_128.pth.tar
```

### Score

Contestants need to train and submit models separately in the two given cases, i.e., the number of feedback bits are 48 and 128, respectively.

For each case, the score is defined as

$$score = \frac{1}{N_{sp}} \sum_{j=1}^{N_{sp}} \frac{1}{N_{sb}} \sum_{i=1}^{N_{sb}} \frac{||\mathbf{w}_{i,j}^H \mathbf{w}'_{i,j}||^2}{||\mathbf{w}_{i,j}||^2 ||\mathbf{w}'_{i,j}||^2}$$

where  $N_{sp}$  denotes the number of samples in test set,  $N_{sb}$  denotes the number of subbands of each sample,  $w_{i,j}$  and  $w_{i,j}'$  denote the true eigenvector and predicted eigenvector of the  $i$ th subband in  $j$ th sample, respectively.

**Final score is defined as  $\text{score\_final} = (\text{score\_48bit} + \text{score\_128bit}) / 2$ .**

Note: Both the single case score and the final score will be shown on the leaderboard.

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## ■ Bonus

<b>Golden Prize:</b>	<b>300,000 RMB</b>	<b>for 1 team</b>
<b>Silver Prize:</b>	<b>50,000 RMB (per team)</b>	<b>for 2 teams</b>
<b>Bronze Prize:</b>	<b>20,000 RMB (per team)</b>	<b>for 3 teams</b>
<b>Winning Prize:</b>	<b>10,000 RMB (per team)</b>	<b>for 4 teams</b>

Note 1– the award can be settled in US dollars according to the exchange rate on the settlement date

Note 2– the individual income tax or other forms of tax on the bonus will be borne by the winners, and will be withheld and paid by the organizer of the competition. The participating teams shall be responsible for the distribution and distribution of the bonus among their members, and the organizer will not be held responsible for this.

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## ■ Contact

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Email: [liujia@datafountain.cn](mailto:liujia@datafountain.cn)

Community:

Official WeChat Communication Group:

Group 1: 2021-WAIC-AI based CSI Feedback



## **Track 2: AI-based Channel Estimation**

**Organizer: CAICT vivo**

### **Background**

Accurate channel estimation (CE) and effective channel state information (CSI) feedback are the basic conditions to ensure the performance of wireless communication system, and will be the core topic of the 2nd Wireless Communication AI Competition. Track “AI-based Channel Estimation” mainly aims at channel estimation problems, and constructs the corresponding competitive theme.

In the discussion of 3GPP, demodulation reference signal (DMRS) channel estimation is one of the key points in channel estimation problems. The DMRS is transmitted along with the data signals, using the same transmit precoding of the data signals and suffering from the similar channel fading. The channel information of all resource elements could be estimated by detecting DMRS.

Linear algorithms, e.g., Wiener filtering, are mainly used in current DMRS channel estimation. In practical system, these linear algorithms are efficient but not optimal. Employing AI in DMRS channel estimation, the accuracy of channel estimation is expected to be further improved and better system performance could be achieved.

### **Task**

In this competition, we consider to make use of the nonlinear recovery performance of AI, use DMRS on small number of resource elements as the input, to estimate the channel information on all resource elements, which could be used for the signal demodulation of the receiver.

Specifically, the characteristics of this competition are as follows:

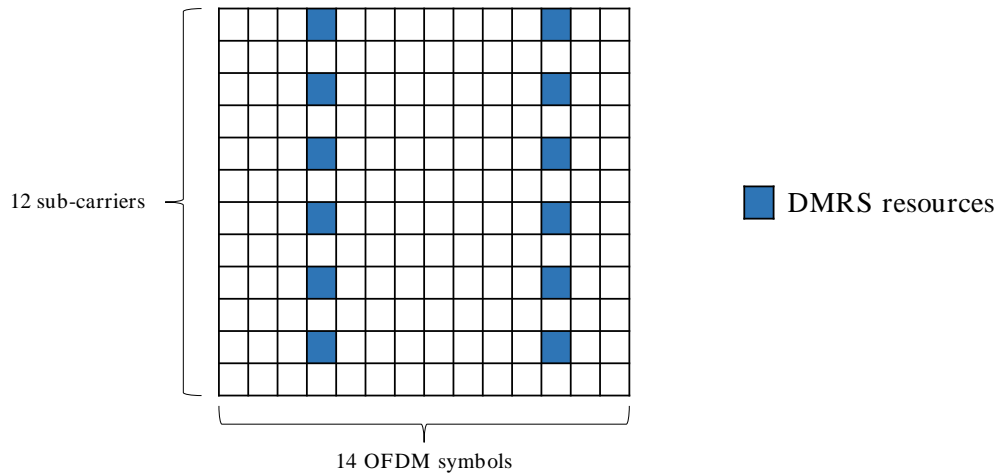
- a. Based on the basic requirements of wireless communication, this competition focuses on the channel estimation performance gain of AI model.
- b. Considering the variety of practical environment, this competition focuses on the generalization performance of AI model in a complex channel environment.

## Dataset

A full channel data set is generated under the multi-input multi-output (MIMO) channel environment of 32 transmitting antennas and 2 receiving antennas (32T2R). It is expected that contestants could obtain high accuracy of DMRS channel estimation, and good generalization performance in a complex channel environment.

DMRS is located sparsely in the time-frequency resources and transmitted along with data signals with same precoding. Here a classic signal receiving equation is introduced,  $y=hx+n$ , where  $y$  is the received signal,  $h$  is the channel,  $x$  is the transmit signal and  $n$  is the noise. For the received signal  $y$  on DMRS resources,  $x$  is the known DMRS sequence and then  $h$ , which is the channel information on DMRS resource, could be estimated from  $y$  and  $x$ . Then the channel information on all time-frequency resources could be estimated. For the received signal  $y$  on data signal resources, since  $h$  has been estimated previously, the data  $x$  could be demodulated from  $y$  and  $h$ .

The input of AI module is the estimated channel information on DMRS resource elements, corresponding to  $H\_in$  in data samples, and the output of AI module is the channel information on all resource elements, corresponding to  $H\_out$  in data samples. The DMRS pattern of 12 sub-carriers and 14 OFDM symbols could be seen in the figure. The number of data samples is 210000. In each sample, the input is  $H\_in$  and the size is  $48*2*2$ , which correspond to 48 sub-carriers, 2 symbols, the real part and the imaginary part. The output is  $H\_out$  and the size is  $96*14*2$ , which correspond to 96 sub-carriers, 14 symbols, the real part and the imaginary part. There are 96 sub-carriers in the frequency domain, where  $H\_out$  occupies all the sub-carriers and  $H\_in$  occupies the odd sub-carriers. There are 14 OFDM symbols in the time domain, where  $H\_out$  occupies all the OFDM symbols and  $H\_in$  occupies the 4<sup>th</sup> and 12<sup>th</sup> OFDM symbols. Beamforming is employed at the transmitter. The transmitted signals of 32 transmit antennas are transformed to one signal and the same beamforming vector is used for all sub-carriers. The receiver has two receive antennas, but  $H\_in$  and  $H\_out$  only represent the channel information of the first receive antenna. There is correlation in frequency domain and time domain, respectively, which could be used by contestants to achieve better scores.



In each sample, the channel conditions are randomly generated, such as the delay spread, UE speed, signal-to-noise ratio (SNR). The value of SNR is provided in each sample.

The online test data set contains multiple SNRs, which are 0dB, 5dB, 10dB, 15dB and 20dB.

The online test data set is not provided to contestants.

The training data set is Data\_train.mat and is provided to contestants to train AI models.

Note: The competition does not allow the use of external data sets. After the evaluation, the team to be awarded should explain the training process in the work review stage, and repeat the training process if necessary.

## Result Submission

Contestants should design the model according to the following rules, and upload the zip package of the model to the scoring system of the competition platform.

1. Recommended programming language version: Python 3.6,
2. Recommended package version: tensorflow 2.1.0; pytorch > 1.0.0; Numpy 1.18.1; matplotlib 3.1.2; h5py 2.10.0 ; Sklearn 0.23.2,
3. Maximum upload file size: 10MB

The scoring system supports the submission of model using TensorFlow or Pytorch. We provide the templates of both as baseline for reference. Both versions provide modelTrain.py and modelDesign.py, where

1. modelTrain.py: for model constructing and training. The training data address is set as 'TrainingData.mat', and the model saving address is set as 'modelSubmit.h5' (for Tensorflow) or 'modelSubmit.pth' (for PyTorch).



2. modelDesign.py: for model designing. The ‘AIModel’ function defines the AI model for DMRS channel estimation. The ‘NMSE’ function is used to calculate normalized mean square error (NMSE).

Files need to be submitted:

1. modelDesign.py;
2. modelSubmit.h5 (for TensorFlow) or modelSubmit.pth (for Pytorch)

### [Submission Example]

For TensorFlow: Zip the files with the following structure, name the zip package with [submit\_tf] and upload it, i.e.,

submit\_tf.zip

```
├── modelDesign.py
└── modelSubmit.h5
```

For Pytorch: Zip the files with the following structure, name the zip package with [submit\_pt] and upload it, i.e.,

submit\_pt.zip

```
├── modelDesign.py
└── modelSubmit.pth
```

## Score

1. For one SNR, the score is

$$\text{score} = -10\log_{10}(\text{NMSE})$$

where NMSE denotes the normalized mean square error between the output of AI model and  $H_{\text{out}}$ .

2. The final score is the average of multiple SNRs, i.e.,

### Final score

$$= (\text{score of 0dB} + \text{score of 5dB} + \text{score of 10dB} + \text{score of 15dB} + \text{score of 20dB})/5$$

Note: Both the single SNR score and the final score will be shown on the leaderboard.

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■ **Bonus**

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<b>Silver Prize:</b>	<b>50,000 RMB (per team)</b>	<b>for 2 teams</b>
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Note 1– the award can be settled in US dollars according to the exchange rate on the settlement date

Note 2– the individual income tax or other forms of tax on the bonus will be borne by the winners, and will be withheld and paid by the organizer of the competition. The participating teams shall be responsible for the distribution and distribution of the bonus among their members, and the organizer will not be held responsible for this.

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