MindSpore

MindSpore TSC Meeting
Apr 15 2021

Antitrust Policy Notice

- MindSpore community meetings involve participation by industry competitors, and it is the intention of the MindSpore community to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable antitrust and competition laws in the member representative's nation or state.

MindSpore Useful Information

- Website: www.mindspore.cn (Chinese/English Display)
- Gitee: https://gitee.com/mindspore GitHub: https://github.com/mindspore-ai

  iHub:https://code.ihub.org.cn/companies/4vioxkz2
- Mailing Lists: https://mailweb.mindspore.cn/postorius/lists/mindspore-tsc.mindspore.cn/
- Logo:
  - https://gitee.com/mindspore/community/blob/master/MindSpore-logo.png
  - https://github.com/mindspore-ai/community/blob/master/MindSpore-logo.png
- Presentation Template:
  - https://gitee.com/mindspore/community/tree/master/slides
  - https://github.com/mindspore-ai/community/tree/master/slides
- Charter:
  - https://gitee.com/mindspore/community/blob/master/governance.md
  - https://github.com/mindspore-ai/community/blob/master/governance.md

Agenda

- Roll Call and Approval for previous minutes
- Community Progress Update
- SIGs/WGs Update
- Release Plan Review
- Operational Matters

Roll Call
(First name alphabetically ordered)

MindSpore

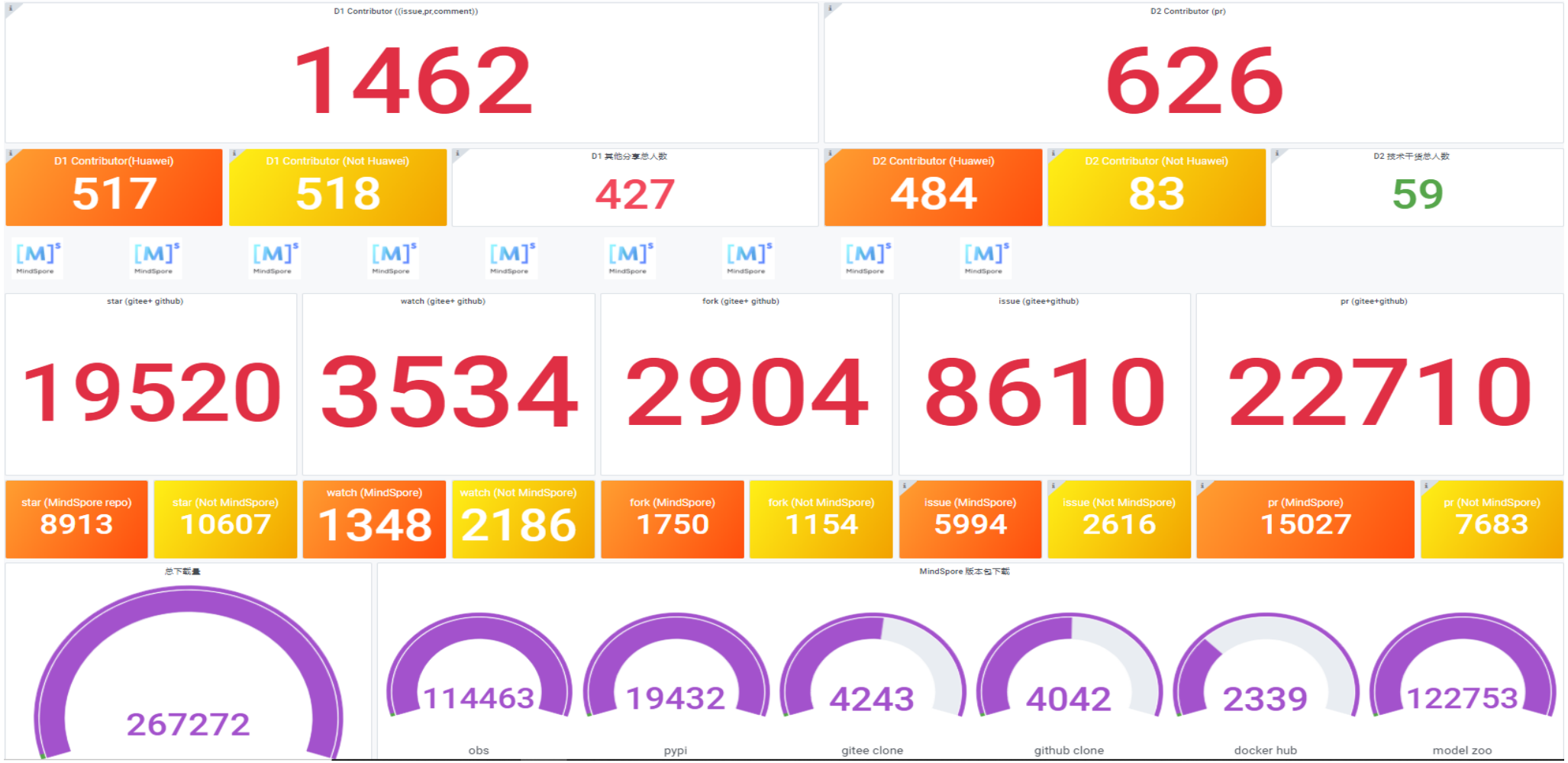
Affiliation	**TSC Member**
University of Edinburgh	Amos Storkey
Conic AI Technology	Han Xiao
ICBC's Big Data and Artificial Intelligence Lab	Jianjun Chen
Tsinghua University	Jun Zhu
University Paris-Sacla	Joel Falcou
Apulis Technology	Jin Li
Huawei	Lei Chen **(Chair)**
Xidian University	Maoguo Gong
Imperial College London	Peter Pietzuch
Key Lab of Intelligent Information Processing of the Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS)	Shiguang Shan
University of Muenster	Sergei Gorlatch
Harbin Institute of Technology	Tonghua Su
University of Science and Technology of China	Xiangyang Li
Peking University/Pengcheng Lab	Yonghong Tian

Approval of previous minutes

- All the meeting notes and slides could be found at:
  - ❑ https://github.com/mindspore-ai/community/tree/master/tsc/meeting-notes
  - ❑ https://github.com/mindspore-ai/community/tree/master/tsc/slides

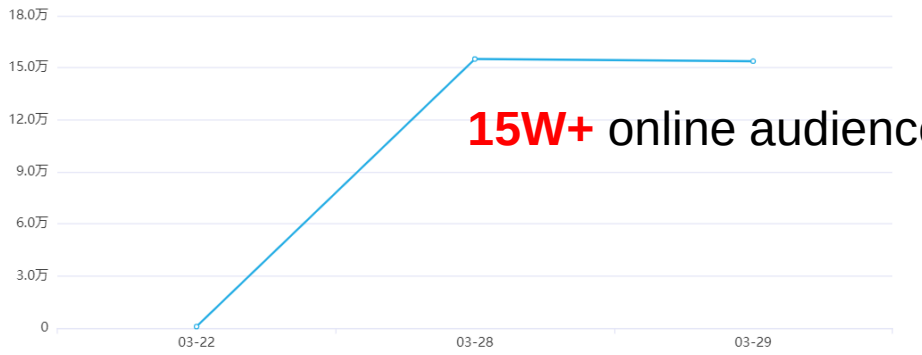
- 2021 Mar TSC meeting recording:
  - ❑ https://www.bilibili.com/video/BV1ty4y1x7bP

Community Progress Update



2021 Mar: **20w** download, **34%** growth

Community Progress Update: MindSpore Anniversary



15W+ online audience

比PyTorch、TensorFlow更快，MindSpore开源一周年升级巨量新特性

机器之心 3月29日

以下文章来源于MindSpore ，作者MindSpore

MindSpore
MindSpore全场景AI框架

机器之心发布

机器之心编辑部

大家好，在 MindSpore 开发团队和社区开发者共同努力下，MindSpore 很多的新特性马上要与大家见面了，比如**动态图分布式训练效率的大幅提升、一键模型迁移、模型鲁棒性检测、深度分子模拟及量子机器学习**等，无论是在效率提升、易用性，还是创新方面，都是干货满满。下面就给大家快速预览即将到来的这些关键特性的文字描述，欢迎大家在 **3 月 29 日** MindSpore 官方 B 站观看直播讲解，点击文章底部**「阅读原文」**可快速跳转至直播讲解。

2W+ read

Community Progress Update: MindSpore in-hand

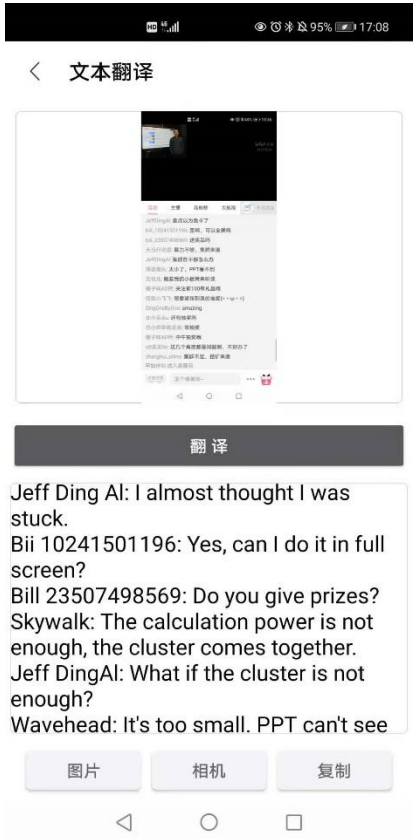
MindSpore

Image segmentation

Bone detection

Intelligent poet

Text translation



SIGs/WGs Update

- MindSpore Doc WG —— Lead replacement
  - Pull Request: https://gitee.com/mindspore/community/pulls/131

Release Plan Review: v1.2.0

MindSpore

NewModels

- [STABLE] Add CV models on Ascend: 3D Unet, Unet++, SSD-Resnet50-fpn, SSD-VGG16, crnn_seq2seq_ocr for BSI, CTPN, resnet18, DPN
- [STABLE] Add CV models on GPU: Faster-RCNN
- [STABLE] Add NLP models on Ascend: NAML, Fasttext, G
- [STABLE] Add NLP models on GPU: LSTM
- [BETA] Add TPRR: Thinking Path Re-Ranker, an original ranked-base framework for Multi-Hop Question Answering which has won the first place in HotpotQA leaderboard.(Ascend)

FrontEnd

- [STABLE] Support side effects expression to ensure that the perform order of user's semantics is correct.(Ascend/GPU/CPU)
- [STABLE] Support calculating the gradient for network that contain non-Tensor input parameters（int, float, bool, mstype,int, mstype.float, mstype.uint, mstype.bool_, tuple, list, dict）.(Ascend/GPU/CPU)
- [STABLE] Support the inverse of a bool Tensor.(Ascend/GPU/CPU)
- [STABLE] Uniform the interface isinstance.(Ascend/GPU/CPU)
- [STABLE] Support negative indexes.(Ascend/GPU/CPU)
- [STABLE] Support 110+ Numpy-like interfaces in mindspore.numpy.(Ascend/GPU/CPU)
- [STABLE] Support export/load mindir model with a size greater than 2 GB.
- [STABLE] The optimizer supports gradient centralization.(Ascend)
- [STABLE] Support support auc metric, rou metric, bleu score metric, confusion matrix metric, cosine similarity metric, dice metric, hausdorff distance metric, occlusion sensitivity metric, perplexity metric, mean surface distance metric, root mean surface distance metric.
- [STABLE] Support use EmbeddingLookup with cache.(Ascend)

Release Plan Review: v1.2.0

Auto Parallel

- [STABLE] Support AllGather and ReduceScatter fusion.(Ascend)
- [STABLE] Support gradient accumulation feature in auto parallel mode.(Ascend/GPU)
- [STABLE] Support running parallel optimizer with gradient accumulation.(Ascend)
- [STABLE] Add the configuration of communication operators' fusion.(Ascend)

Executor

- [STABLE] Support inference with Nvidia GPU.
- [STABLE] Support data parallelism in PyNative mode.(Ascend/GPU)

MDP

- [STABLE] Add SPONGE modules for molecular dynamics simulation, including Bond, Angle, Dihedral, Non Bond 14, NeighborList, Particle Mesh Ewald, Langevin MD and LIUJIAN MD.(GPU)

3D Feature

- [STABLE] Support 3D ops: Conv3D, Conv3DBackpropInput, Conv3DBackpropFilter, Conv3DTranspose, BiasAdd, BiasAddGrad, PReLU, Transpose, Reshape, transdata, StrideSlice, MaxPool3D, MaxPool3DGrad, BinaryCrossEntropy, SigmoidCrossEntropyWithLogits, SigmoidCrossEntropyWithLogitsGrad, SoftmaxCrossEntropyWithLogits, SigmoidCrossEntropyWithLogits, SigmoidCrossEntropyWithLogitsGrad, BatchNorm3d, BatchNorm3dGrad, Dropout3d.
- [STABLE] Support RMSELoss loss function, MAELoss loss function, FocalLoss loss function, DiceLoss binary loss function, and MultiClassDiceLoss multi-type loss function for 2D/3D network.
- [STABLE] Add optimizer: AdamApplyOne(3D), ApplyMomentum(3D), SGD(3D).

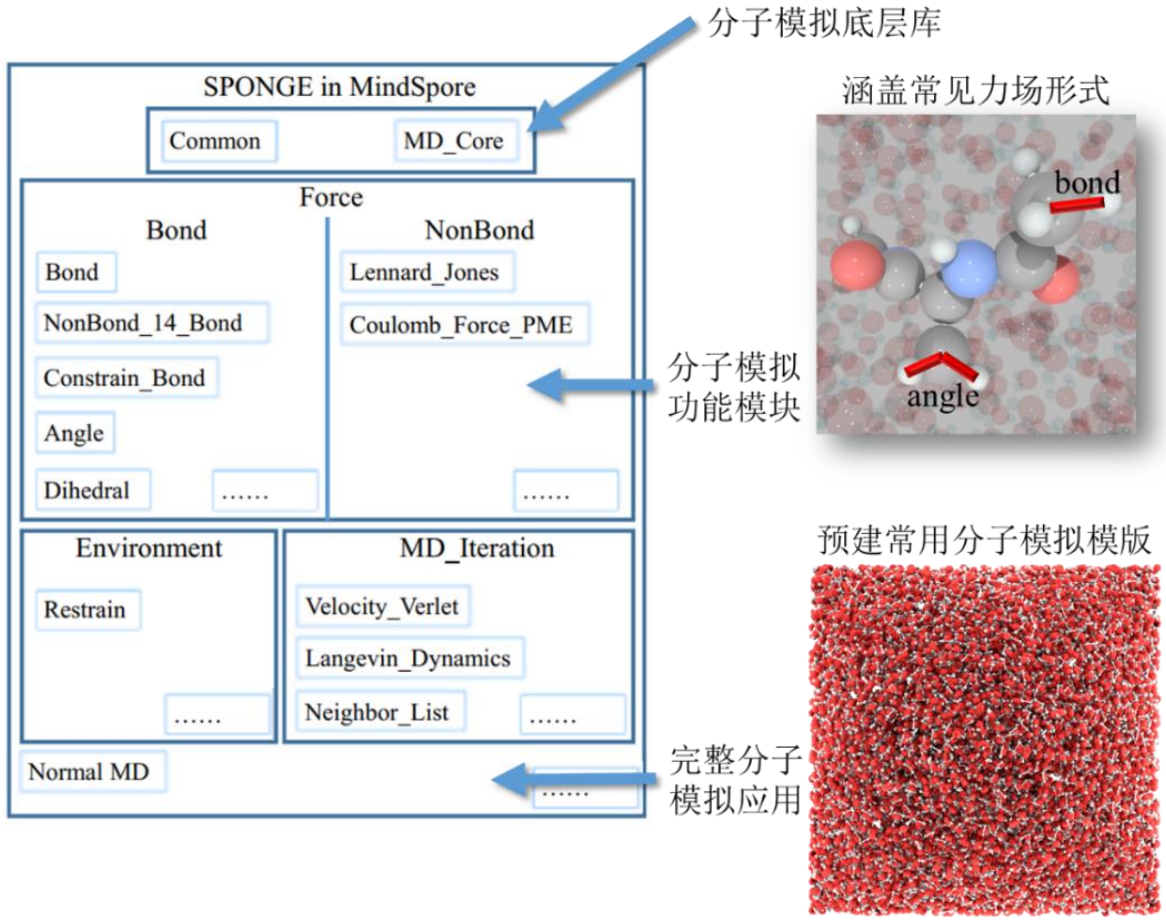
v1.2.0 Features: Performance

- Performance improvement
  - ➢ Auto-parallel in PyNative mode
    - On ResNet50 v1.5+ImageNet dataset: **1.6x** compared to PyTorch
  - ➢ Auto-parallel in Graph mode
    - On ResNet50 v1.5+ImageNet dataset: **2x** compared to TensorFlow
  - ➢ Dvpp (Digital Vision Pre-processing)

On coco2017 test dataset:

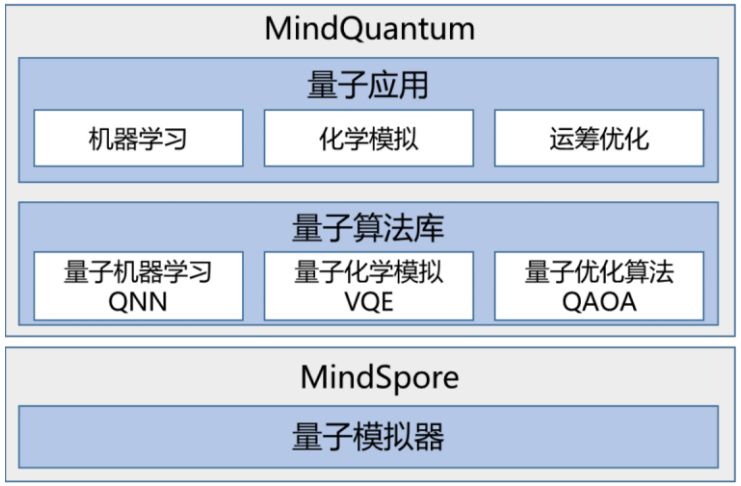
Operator name	Pic num	Time (s)	fps	Dvpp improvement
Decode+Resize+CenterCrop (Dvpp)	40504	137.864	293.7967852	129%
Decode+Resize+CenterCrop (CPU)	40504	315.444	128.4031397	

v1.2.0 Features: Innovation in HPC



- **SPONGE** is a high performance modular molecular simulation library brought up by MindSpore MM (Molecular Modeling) WG
- By leveraging MindSpore Auto-Diff, Auto-Parallel and Graph-Kernel features, SPONGE can efficiently achieve the molecular simulation operation.
- More details: https://www.mindspore.cn/tutorial/training/zh-CN/r1.2/advanced_use/hpc_sponge.html

v1.2.0 Features: Innovation in Quantum Computing



MindQuantum is a quantum machine learning framework developed by combining MindSpore and HiQ, which supports the training and inference of a variety of quantum neural networks.

https://www.mindspore.cn/tutorial/training/zh-CN/r1.2/advanced_use/parameterized_quantum_circuit.html

MindQuantum vs TF Quantum/Paddle Quantum

Performance comparison	**Question**: MNIST dataset **Parameters**: 17 bits, 112 CPU, Batch Size 14
MindQuantum	**169s**
TF Quantum	300s

Performance comparison	**Question**: Max-Cut QAOA Improvement, Random Graph，12 Graph nodes, 4-level loops **Parameters**: 12 bits, Single thread
MindQuantum	**4s**
Paddle Quantum	97s

v1.2.0 Features: Ease of use

MindConverter is a library provided for MindSpore users to easily convert TensorFlow or PyTorch models to MindSpore models and related wrapper code.

Features:

- One-click migration: Use the MindConverter CLI command to immediately migrate the model to the model definition script and the corresponding weight file under MindSpore with one click, saving model retraining and model definition script development time.
- 100% migration: In the case of cross-frame operator mapping in MindConverter, the script after migration can be directly used for reasoning to achieve 100% migration rate.
- Supported model list: Currently supports regular models (such as ResNet50, YOLO) in the CV field, NLP BERT pre-training model scripts and weight migration.

MindSpore

Next Step

- MindSpore v1.3.0 Release Roadmap
- HDC 2021 (Huawei Developer Conference)
  - **8+** Keynotes, **13+** Roundtables, **45+** Meetups, **90+** Sessions, **35+** Training Camps

THANK YOU