1. How to show the team's overall results
2. Introduction of SUPERB
3. Logistics

How to show the team's overall results

- Part 1: noon - 2:10 p.m., April 24 (ET)
  -- Opening, Hung-yi (10 mins)
  -- SUPERB challenge / Overall Progress, Hung-yi (20 mins)
  -- Tiny SSL, Hao (30 mins)
  -- Sequence Compression, Yen Meng/Ray Chen (20 mins)
  -- Pre-trained Models for Prosody, Nigel/Guan-Ting/Leo Feng (30 mins)
  -- Model initialization, Diego (20 mins)
- Part 2: 10:00 a.m. - 12:10 p.m., April 25 (ET)
  -- Robustness of pre-trained speech models, Hung-yi/Yu (30 mins)
  -- Visual-enhanced pre-training, David (30 mins)
  -- Speech pre-trained models + Text pre-trained models, Jiatong/Ann (20 mins)
  -- Update about Multilingual, Lucas (20 mins)
  -- Adapter/Prompt, Shang-Wen (30 mins)

How to show the team’s overall results

- Improving SSL models on existing tasks
  - Improving performance
  - Greener self-supervised models
  - Efficient task-specific parameter usage
- Unlock SSL models on new tasks

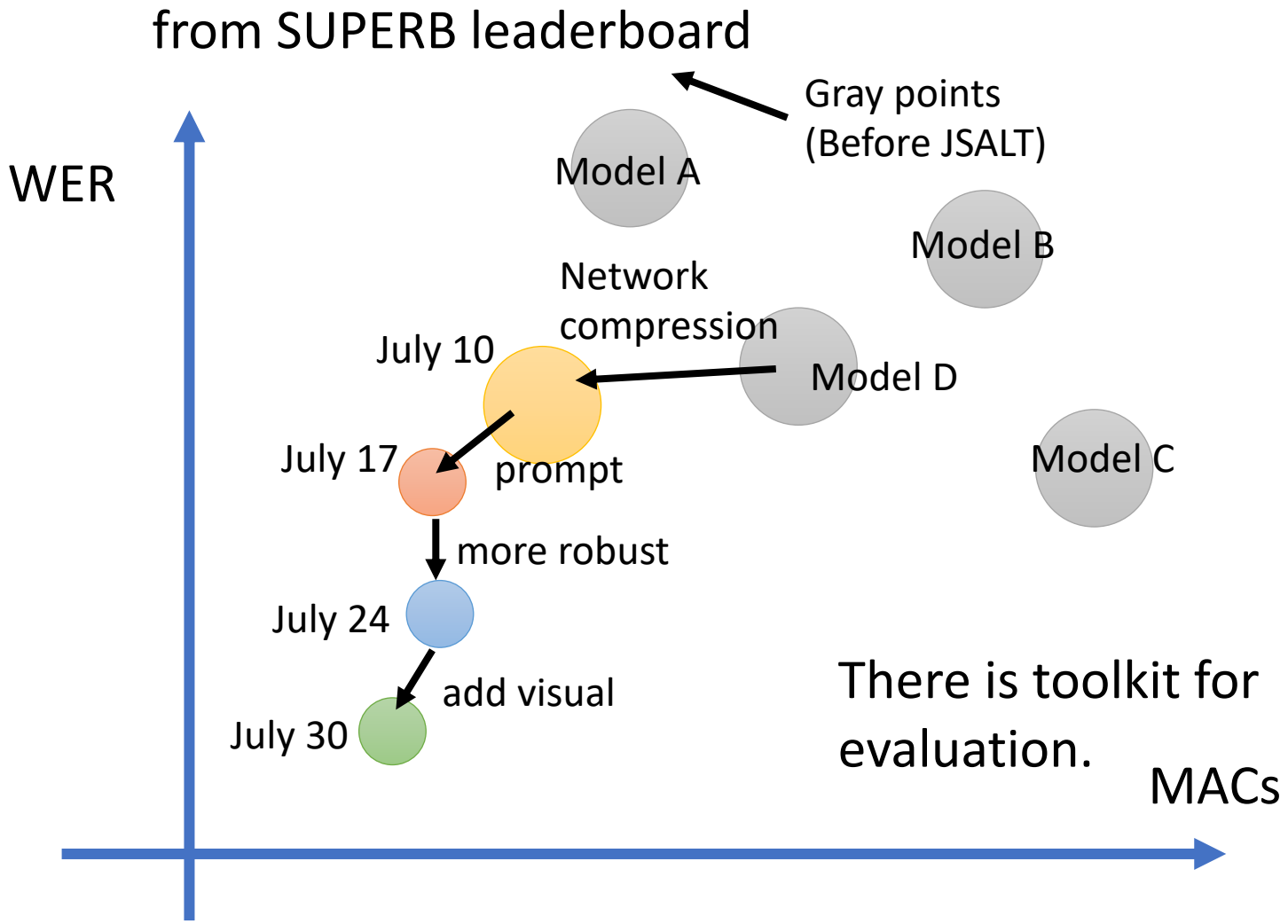
How to show the team's overall results

- For each task

  e.g. ASR

Size of circle: no. of task-specific parameters

(smaller the better)

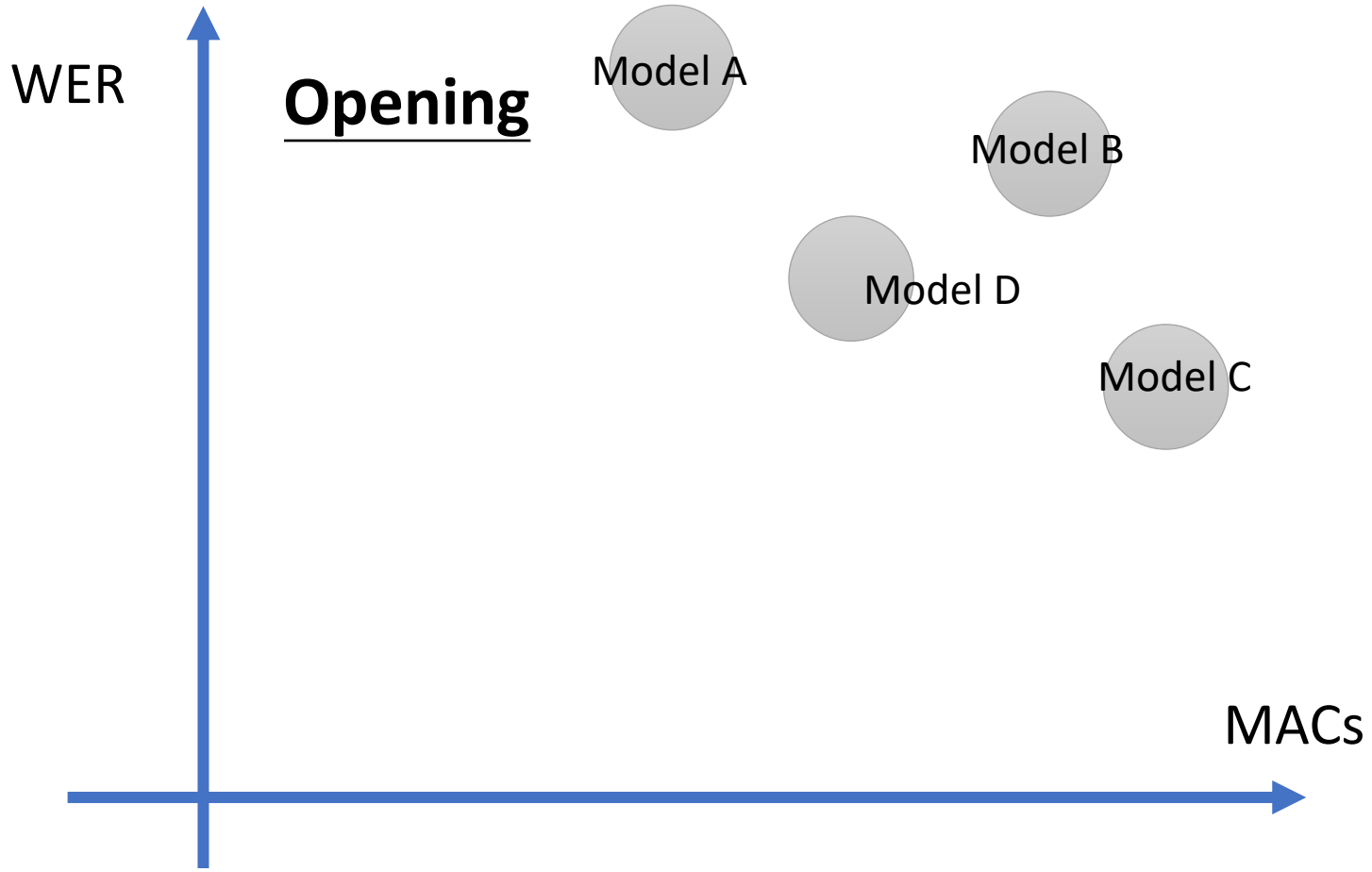


(I make this up. Don't take the dates & results seriously.)

How to show the team's overall results

- For each task
  e.g. ASR

Size of circle: no. of task-specific parameters

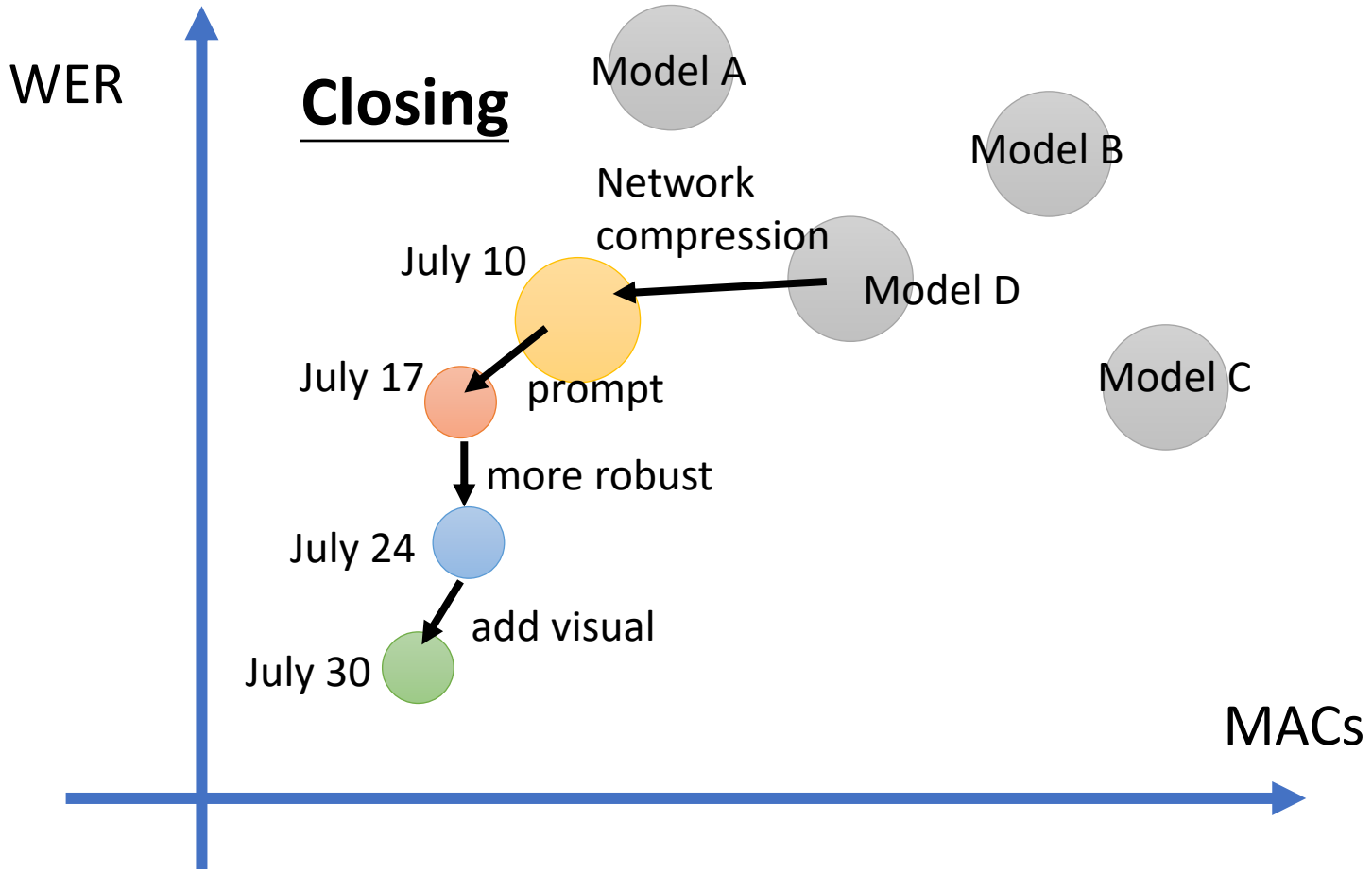


(I make this up. Don't take the dates & results seriously.)

How to show the team's overall results

- For each task
  e.g. ASR

Size of circle: no. of task-specific parameters



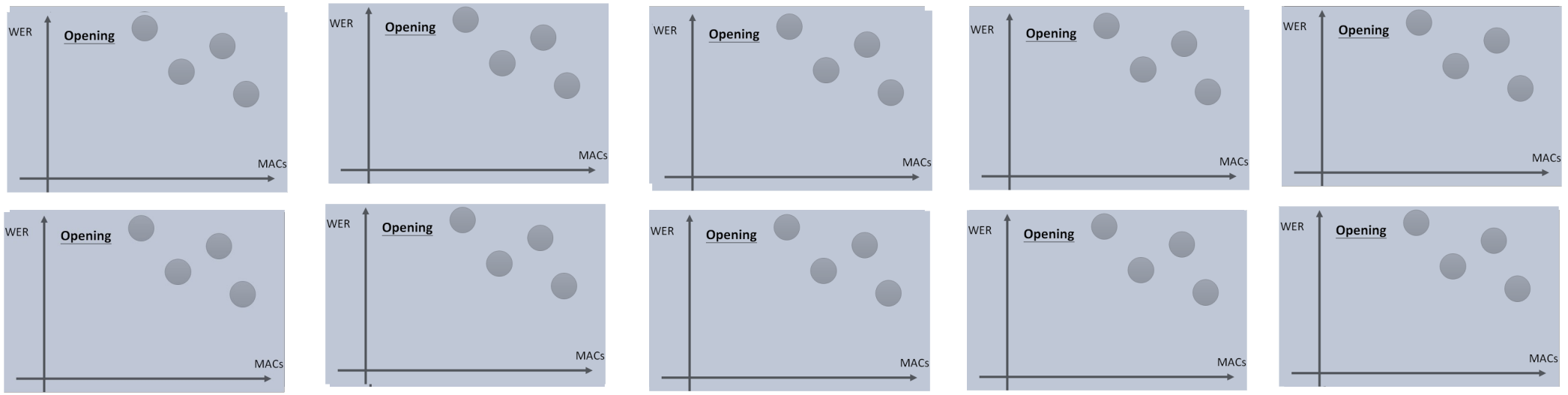
(I make this up. Don't take the dates & results seriously.)

How to show the team's overall results

- Unlock new tasks

Opening

Task number: X



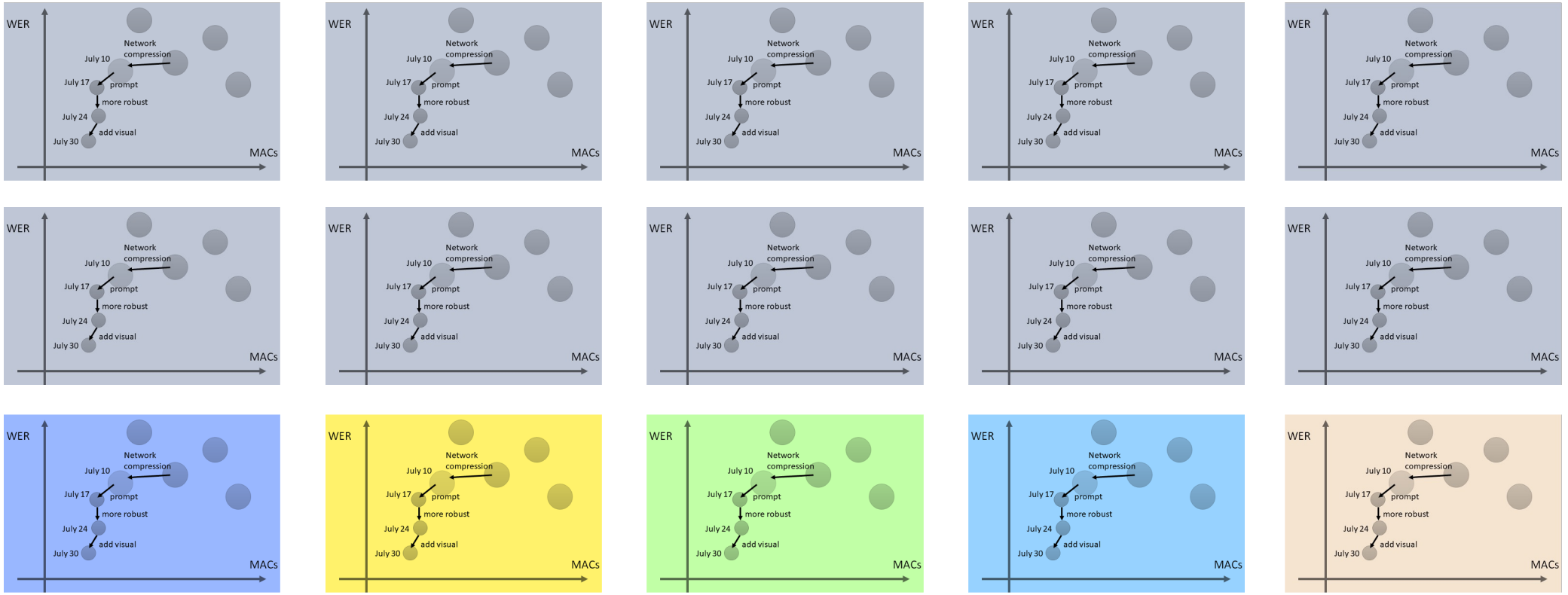
from SUPERB leaderboard

How to show the team's overall results

- Unlock new tasks

Closing

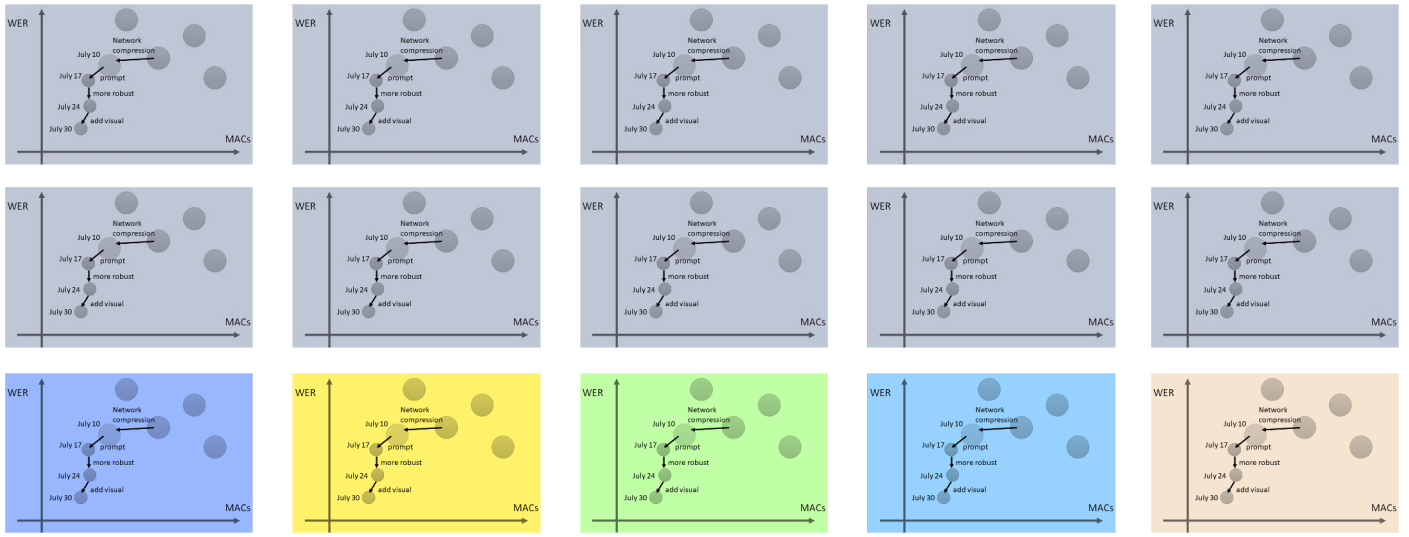
Task number: X to Y



How to show the team's overall results

- A team's webpage to put the figures

Update the figures whenever we get new results



- Twitter account: tweet every time we have new progress
- Another thing: Submit the results to **SUPERB challenge**

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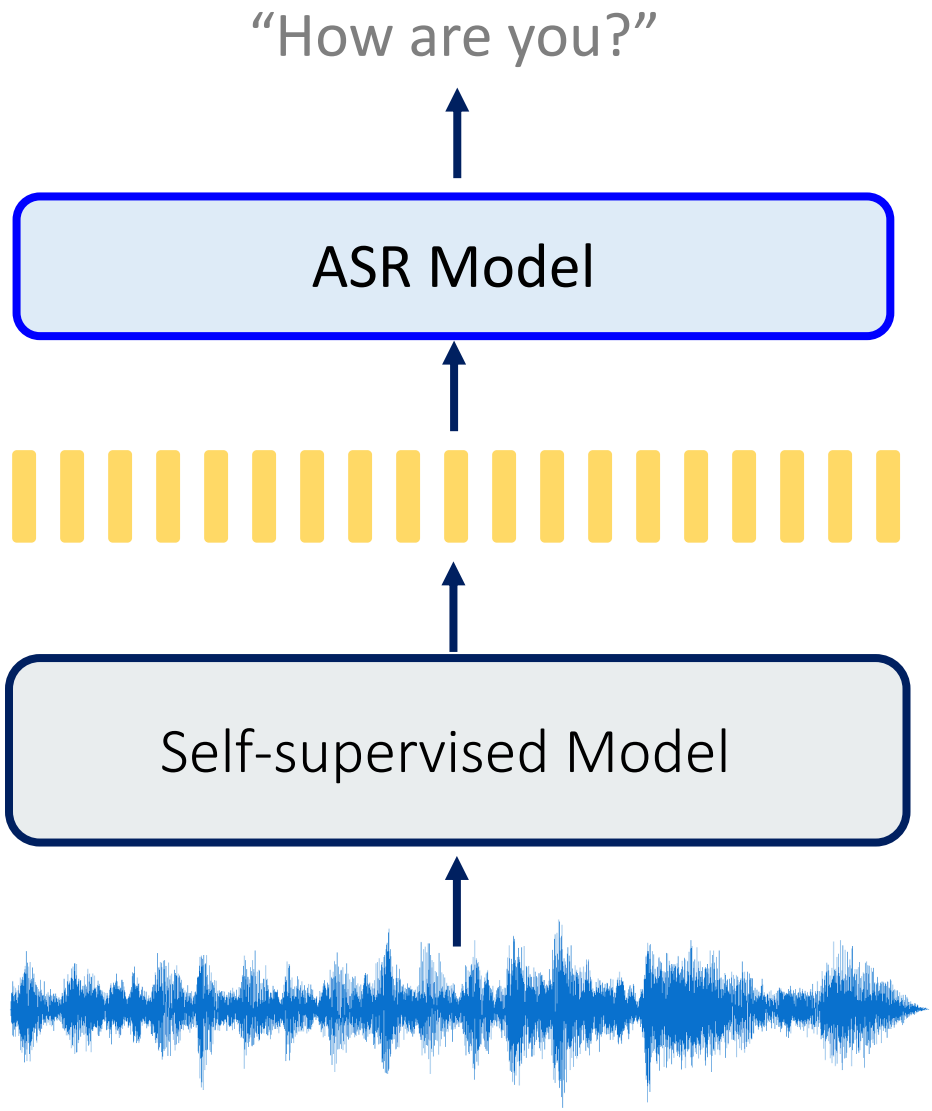
Speech processing Universal PERformance Benchmark

https://superbbenchmark.org/

Motivation

Achieve good performance on ASR



PASE+ APC NPC

Tera DeCoAR Wav2vec

HuBERT WavLM

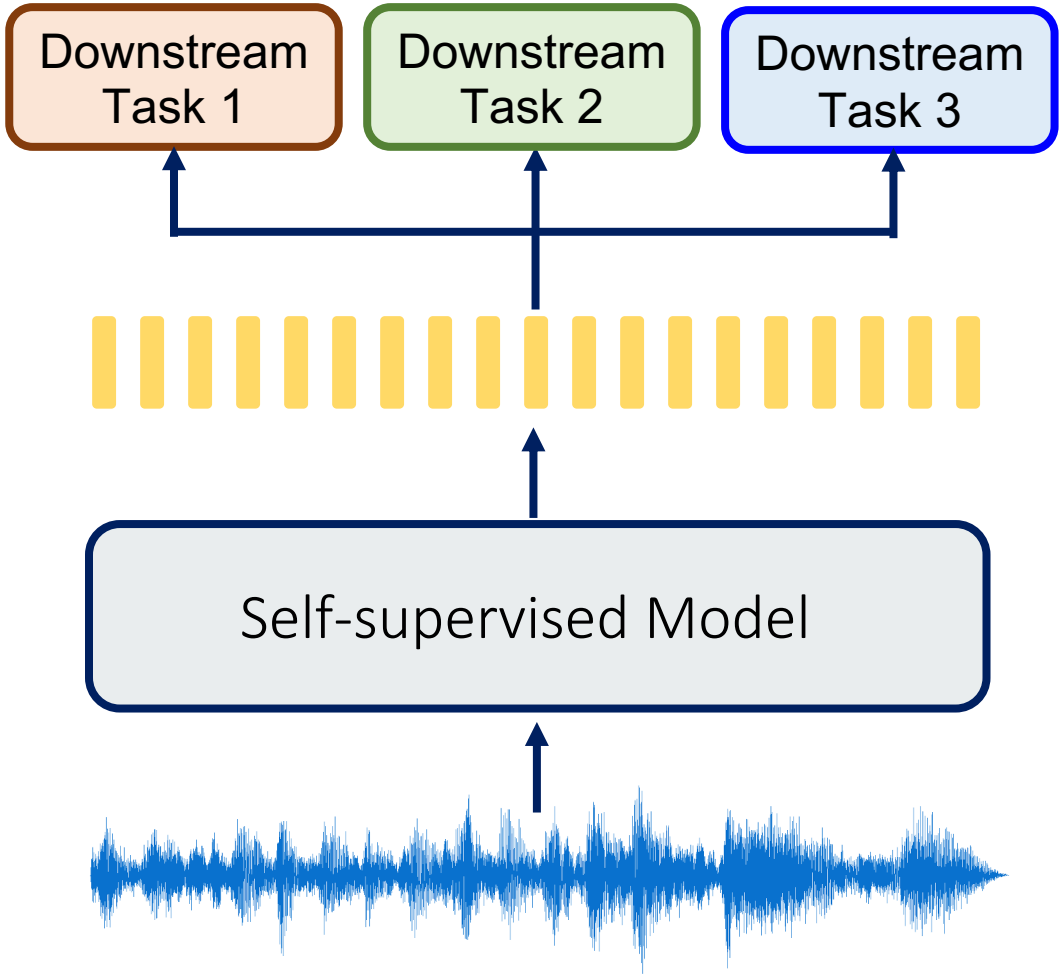
Just name a few …

Motivation

Goal: Benchmark self-supervised models on **a wide range of speech processing tasks**

Applications

Operating Systems



Publication of SUPERB

SUPERB: Speech processing Universal PERformance Benchmark

Shu-wen Yang[1], Po-Han Chi[1], Yung-Sung Chuang[1*], Cheng-I Jeff Lai[2*], Kushal Lakhotia[3*], Yist Y. Lin[1*], Andy T. Liu[1*], Jiatong Shi[4*], Xuankai Chang[6], Guan-Ting Lin[1], Tzu-Hsien Huang[1], Wei-Cheng Tseng[1], Ko-tik Lee[1], Da-Rong Liu[1], Zili Huang[4], Shuyan Dong[5†], Shang-Wen Li[5†], Shinji Watanabe[6], Abdelrahman Mohamed[3], Hung-yi Lee[1]*

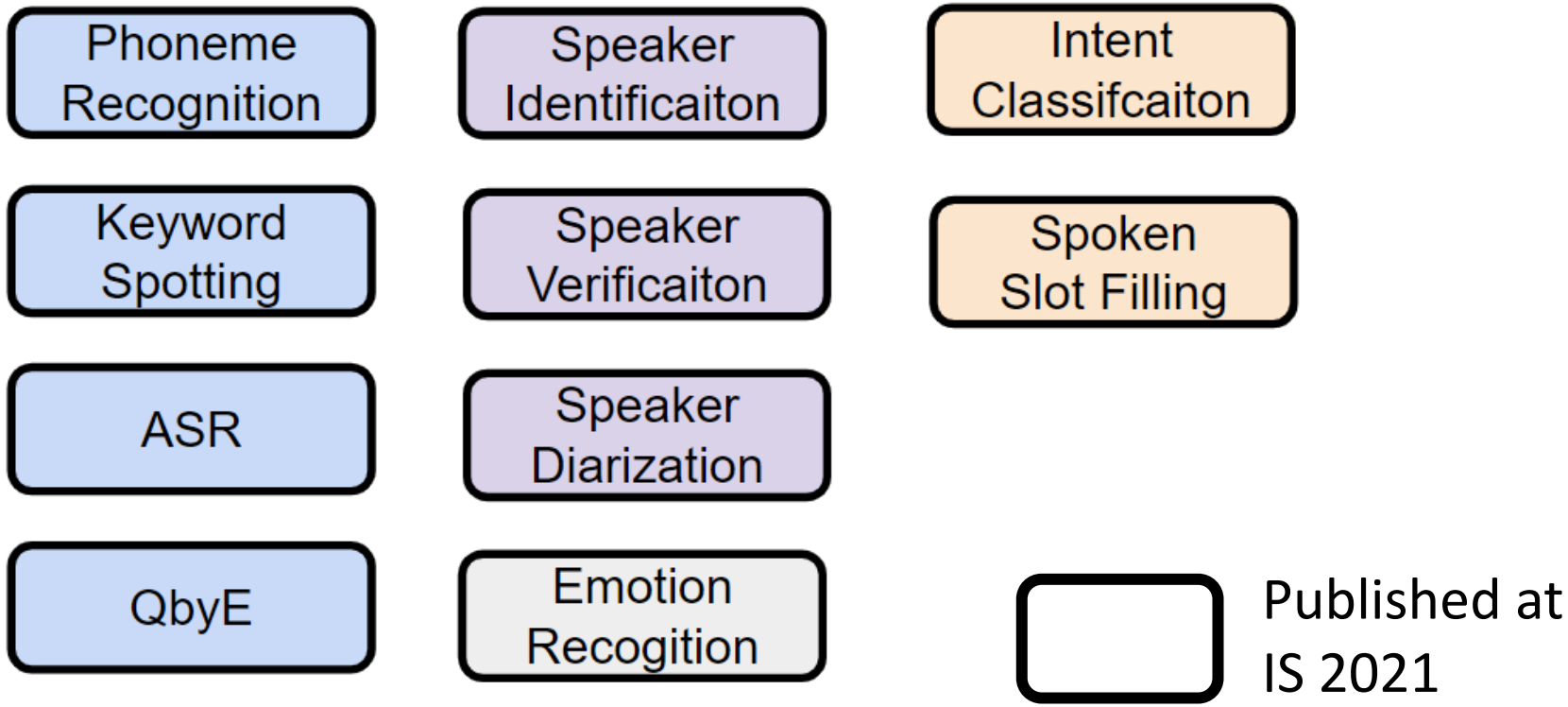
Presented at INTERSPEECH 2021

SUPERB−SG: Enhanced Speech processing Universal PERformance Benchmark for Semantic and Generative Capabilities

Hsiang-Sheng Tsai[1*], Heng-Jui Chang[1*], Wen-Chin Huang[2*], Zili Huang[3*], Kushal Lakhotia[4*], Shu-wen Yang[1], Shuyan Dong[5], Andy T. Liu[1], Cheng-I Lai[6], Jiatong Shi[7], Xuankai Chang[7], Phil Hall[8], Hsuan-Jui Chen[1], Shang-Wen Li[5], Shinji Watanabe[7], Abdelrahman Mohamed[5], Hung-yi Lee[1]

To be appeared at ACL 2022

Downstream Tasks

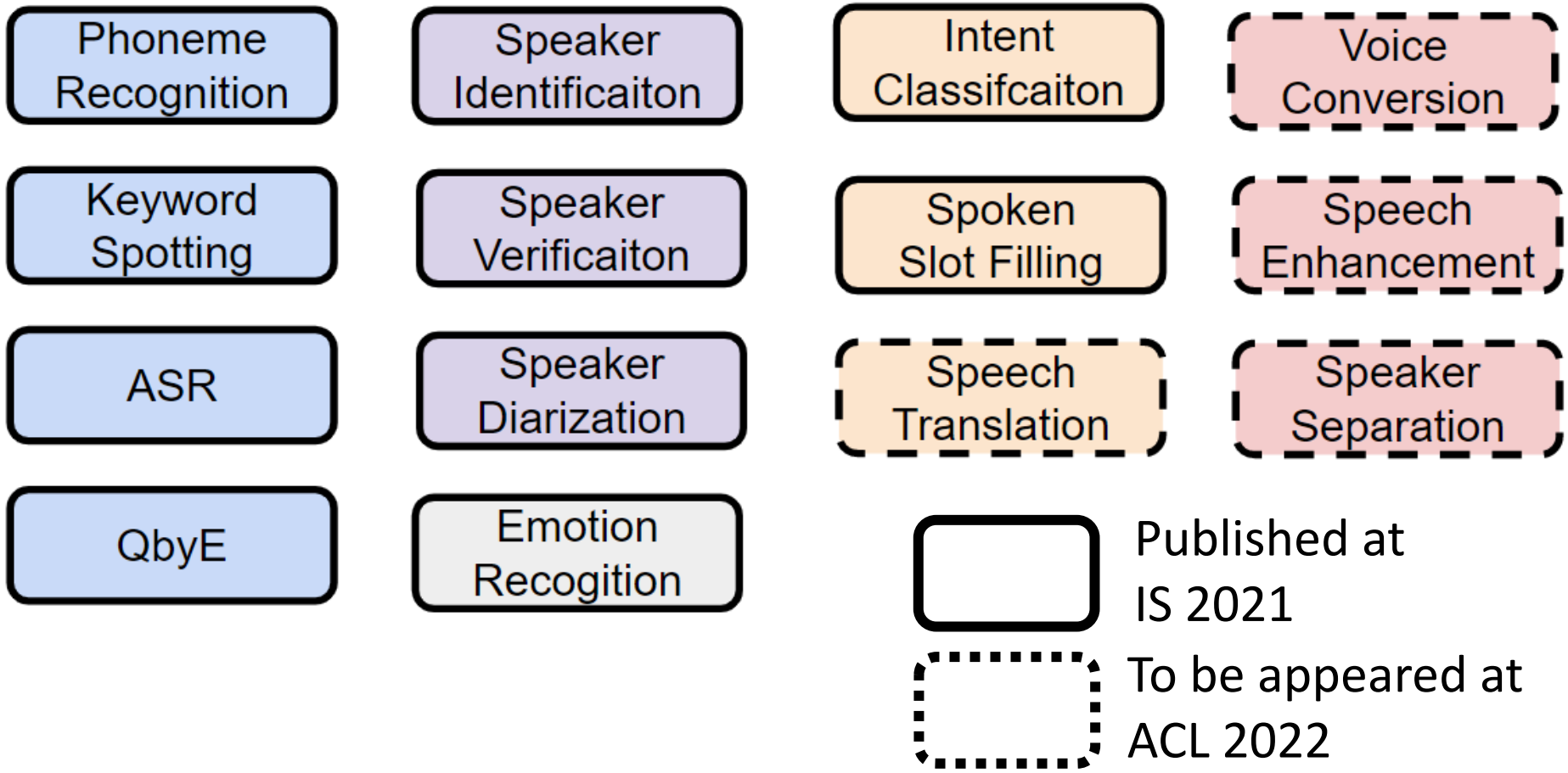


Leaderboard (Tasks in the Interspeech Paper)

https://superbbenchmark.org/leaderboard

Method	Name	Description	URL	Rank ↑	Score ↑	Rank-P ↑	Score-P ↑	PR public ↓	KS public ↑	IC public ↑	SID public ↑	ER pu
WavLM Large	Microsoft	M-P + VQ ...		19.9	1145	6.1	3.61	3.06	97.86	99.31	95.49	70
WavLM Base+	Microsoft	M-P + VQ ...		18.7	1106	12.7	11.68	3.92	97.37	99	89.42	68
WavLM Base	Microsoft	M-P + VQ ...		16.9	1019	11.45	10.76	4.84	96.79	98.63	84.51	65
HuBERT Large	paper	M-P + VQ	-	15.8	919	4.1	2.9	3.53	95.29	98.76	90.33	67
wav2vec 2.0 Large	paper	M-C + VQ	-	15.4	914	3.9	2.88	4.75	96.66	95.28	86.14	65
HuBERT Base	paper	M-P + VQ	-	15.25	941	10.25	9.94	5.41	96.3	98.34	81.42	64
LightHuBERT Small	LightHuB...	Once-for-...		13.95	901	16.4	33.37	6.6	96.07	98.23	69.7	64
FaST-VGS+	Puyuan P...	FaST-VG...	-	13.15	809	5.9	3.72	7.76	97.27	98.97	41.34	62
wav2vec 2.0 Base	paper	M-C + VQ	-	12.35	818	8.7	8.61	5.74	96.23	92.35	75.18	63
DistilHuBERT	Heng-Jui ...	multi-task ...	-	11.2	717	16.2	30.54	16.27	95.98	94.99	73.54	63
DeCoAR 2.0	paper	M-G + VQ	-	10.6	722	8.5	8.03	14.93	94.48	90.8	74.42	62

Downstream Tasks



Leaderboard (Tasks in the Interspeech Paper)

https://superbbenchmark.org/leaderboard

Constrained | Less-constrained | Unconstrained

Empty …

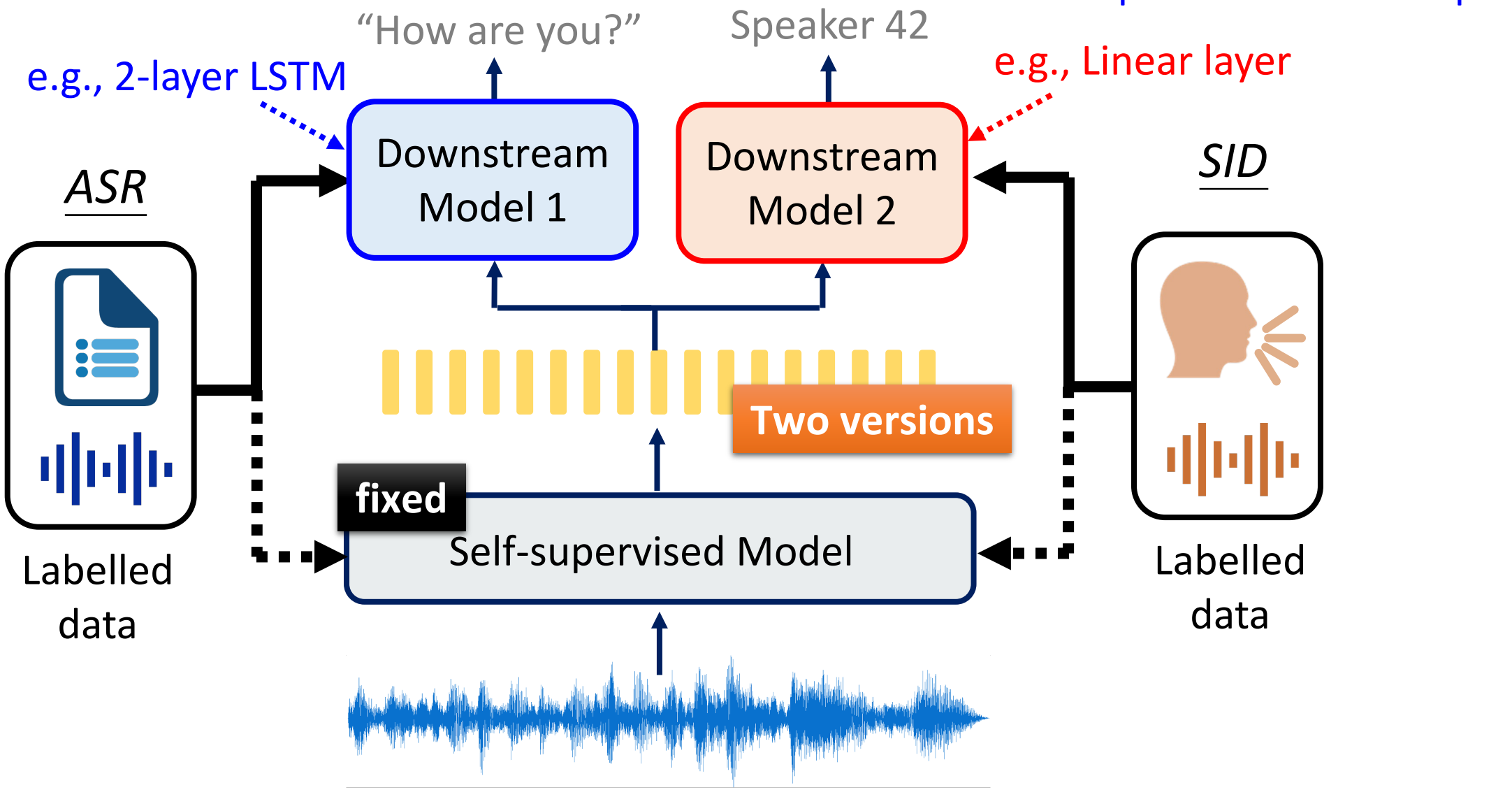
Different ways to use SSL models

Method	Name	Des								public ↑	ER pu
WavLM Large	Microsoft	M-P								95.49	70
WavLM Base+	Microsoft	M-P								89.42	68
WavLM Base	Microsoft	M-P + VQ …	🔗	16.9	1019	11.45	10.76	4.84	96.79	98.63	84.51	65
HuBERT Large	paper	M-P + VQ	-	15.8	919	4.1	2.9	3.53	95.29	98.76	90.33	67
wav2vec 2.0 Large	paper	M-C + VQ	-	15.4	914	3.9	2.88	4.75	96.66	95.28	86.14	65
HuBERT Base	paper	M-P + VQ	-	15.25	941	10.25	9.94	5.41	96.3	98.34	81.42	64
LightHuBERT Small	LightHuB…	Once-for-…	🔗	13.95	901	16.4	33.37	6.6	96.07	98.23	69.7	64
FaST-VGS+	Puyuan P…	FaST-VG…	-	13.15	809	5.9	3.72	7.76	97.27	98.97	41.34	62
wav2vec 2.0 Base	paper	M-C + VQ	-	12.35	818	8.7	8.61	5.74	96.23	92.35	75.18	63
DistilHuBERT	Heng-Jui …	multi-task …	-	11.2	717	16.2	30.54	16.27	95.98	94.99	73.54	63
DeCoAR 2.0	paper	M-G + VQ	-	10.6	722	8.5	8.03	14.93	94.48	90.8	74.42	62

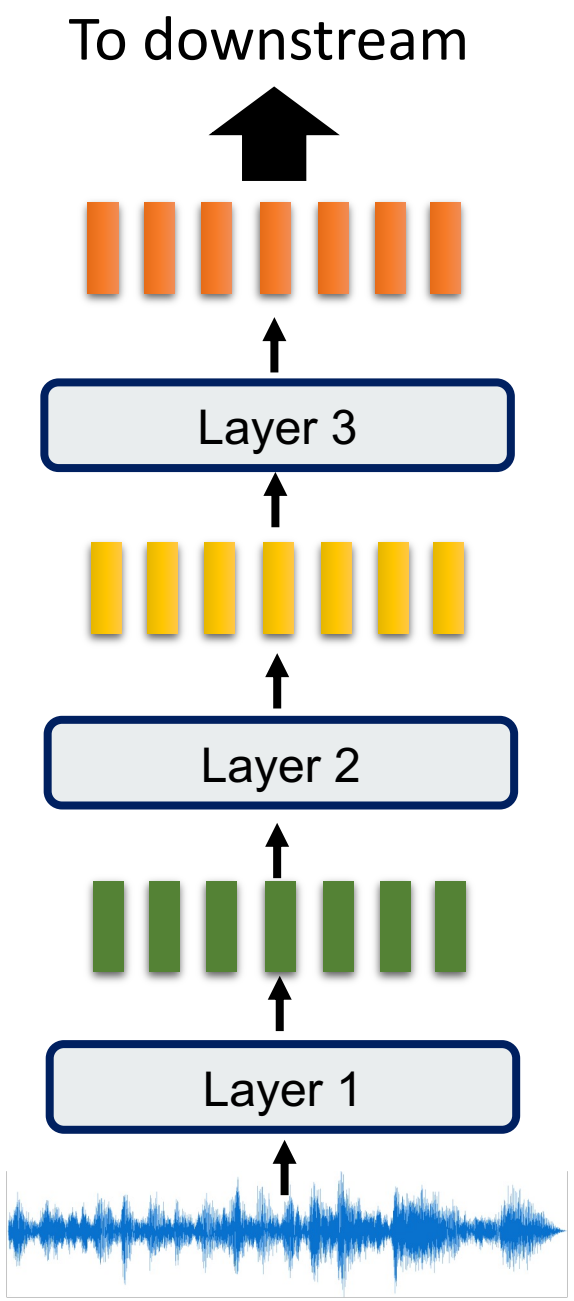
Constrained

Model architectures of downstream models are defined by the SUPERB team.

Keep downstream simple

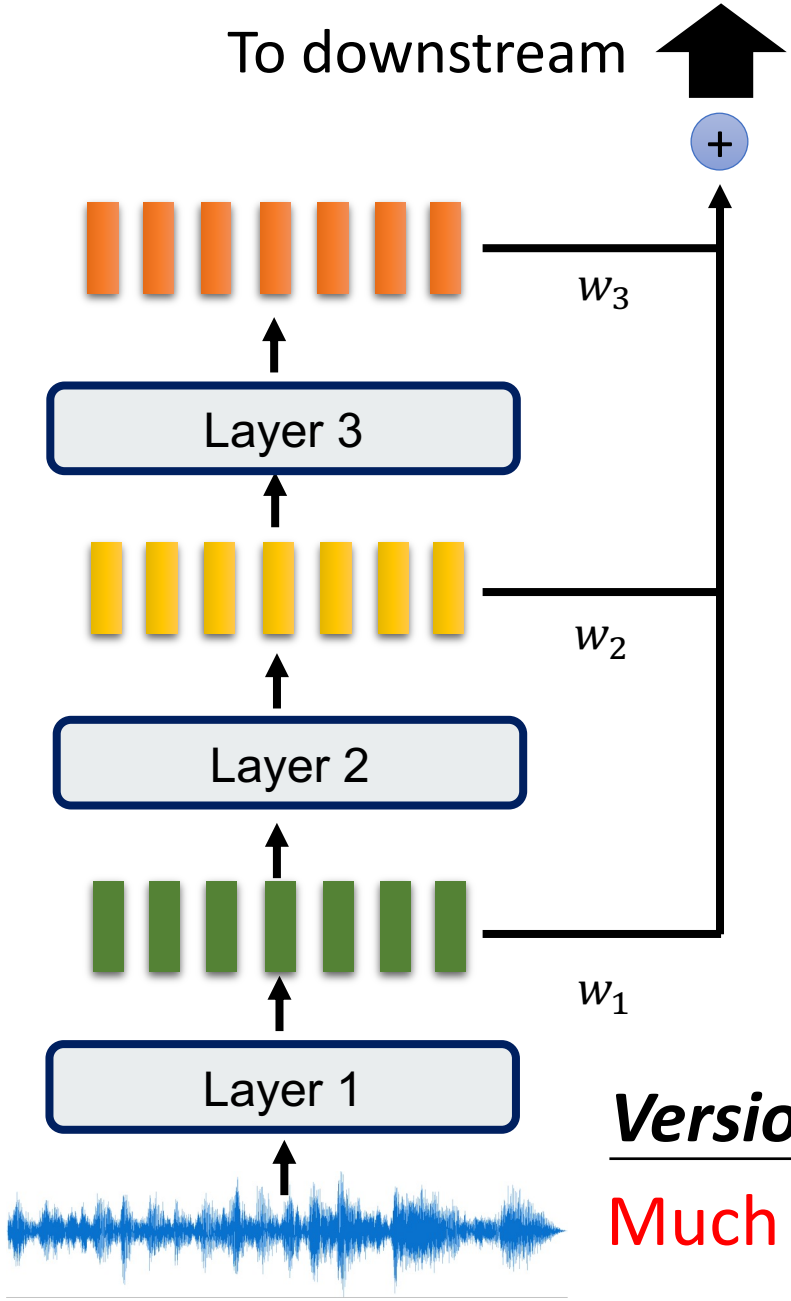


Constrained



Version 1

(deprecated)



Version 2

Much Better

Leaderboard (Tasks in the Interspeech Paper)

https://superbbenchmark.org/leaderboard

Constrained | Less-constrained | Unconstrained

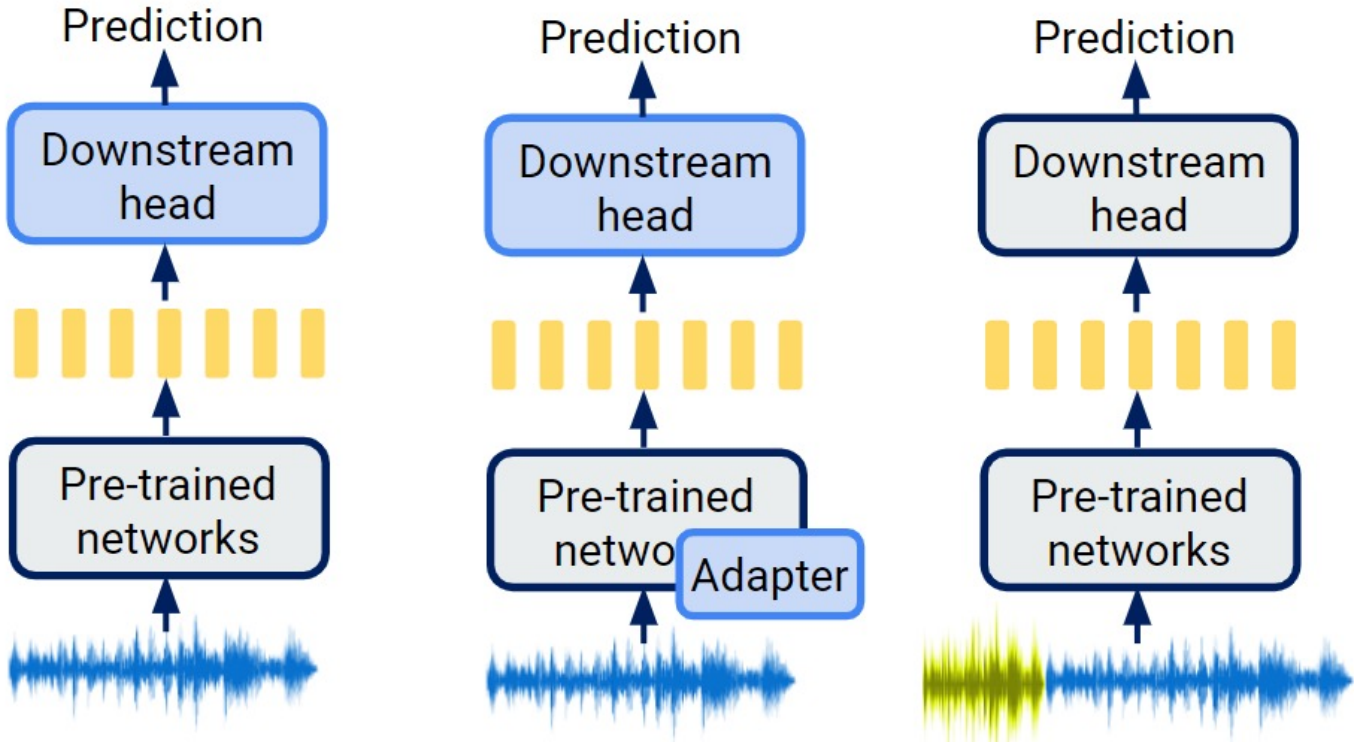
Empty …

Less-constrained: Fix SSL model, but decide how to use it yourself

Consider the number of task-specific parameters

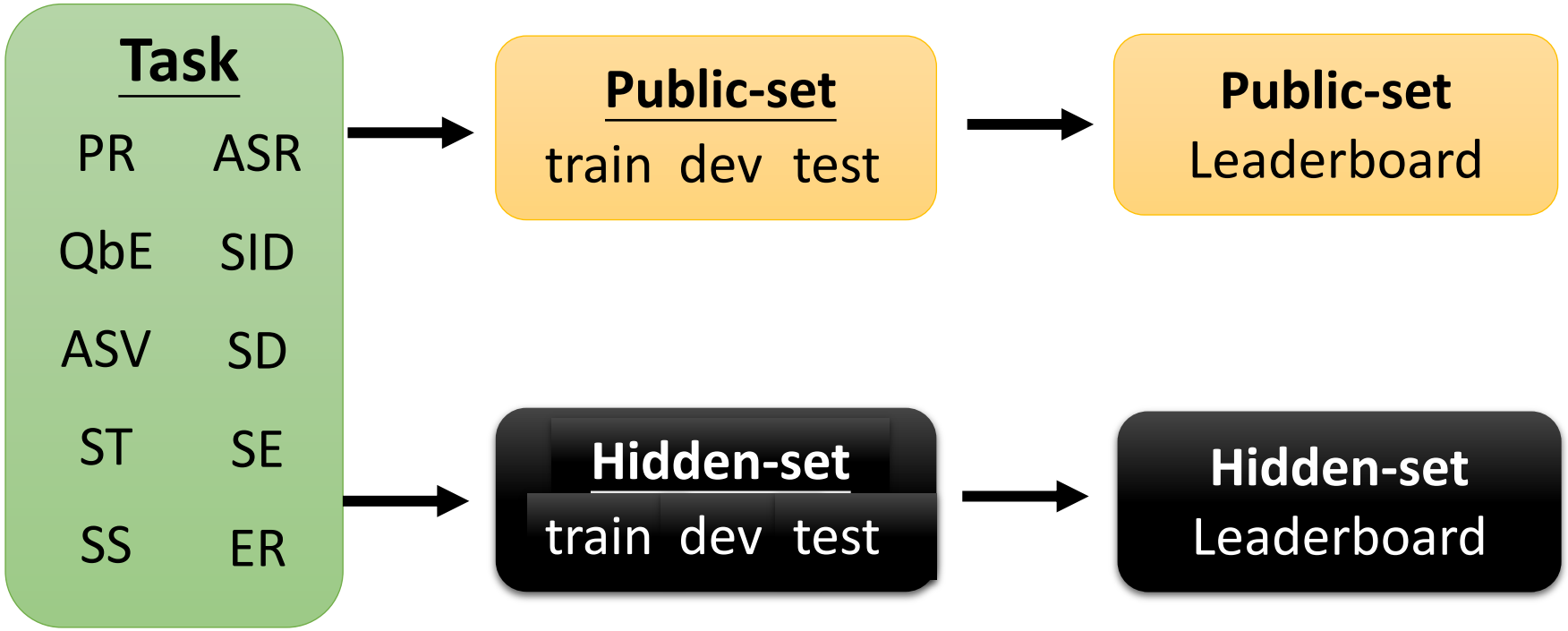
Unconstrained: Fine-tuning SSL & Do whatever you want

What is the difference from other challenges …

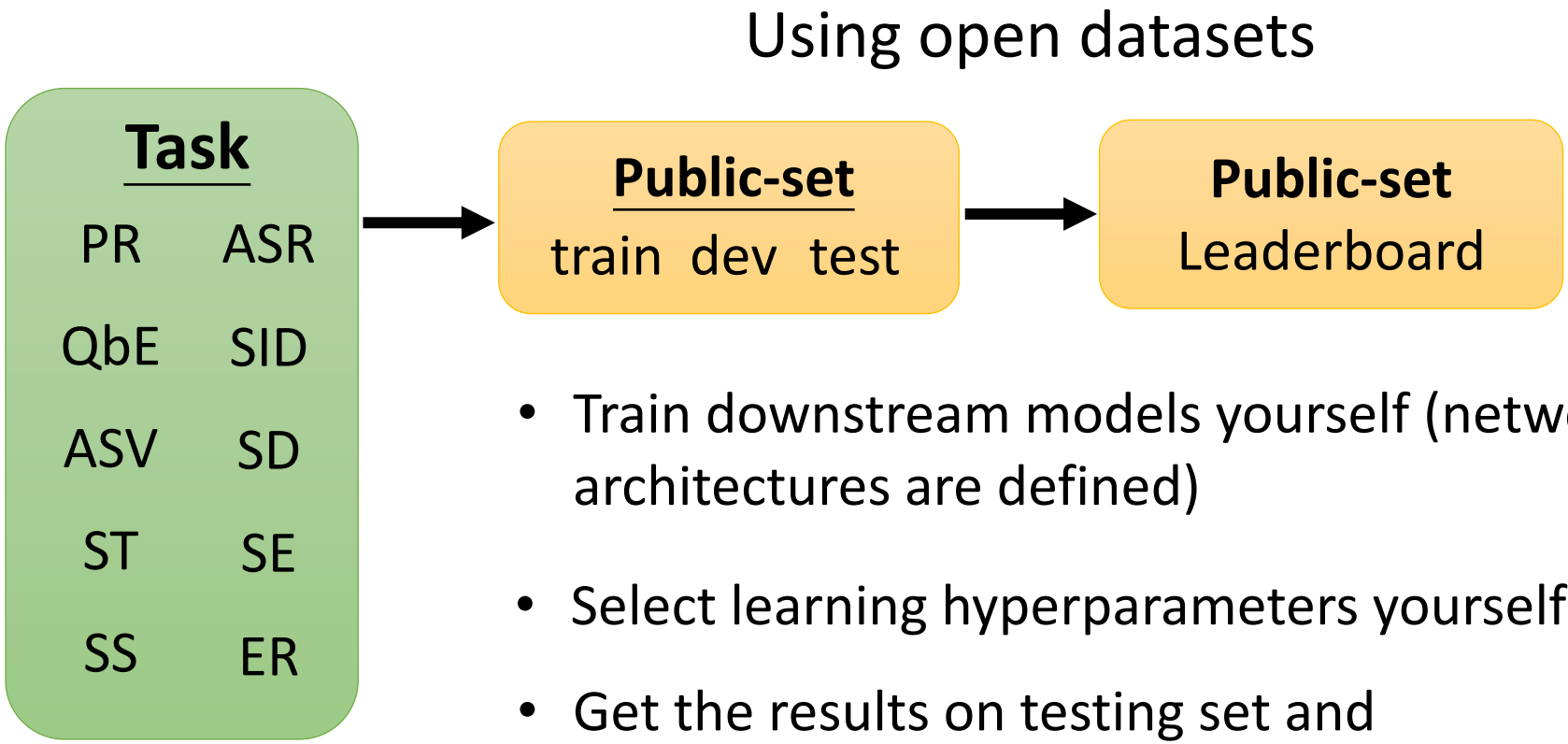


SUPERB Challenge

The SUPERB team submitted a proposal to SLT 2023.



SUPERB Challenge



- Train downstream models yourself (network architectures are defined)
- Select learning hyperparameters yourself
- Get the results on testing set and submit to the public-set leaderboard

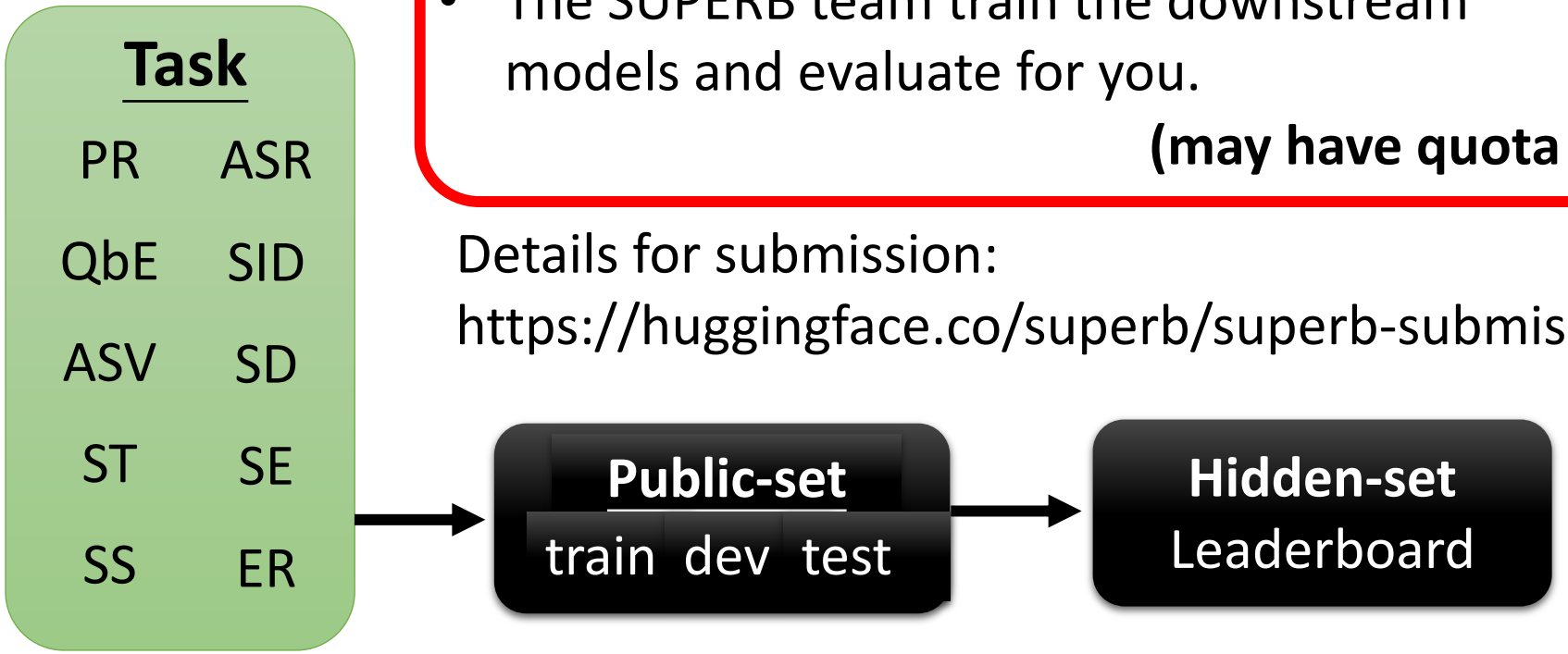
SUPERB Challenge

We can take advantage of this service to a great extent.

- Submit your self-supervised models.
- The SUPERB team train the downstream models and evaluate for you.

(may have quota limitation)

Details for submission:
https://huggingface.co/superb/superb-submission



LXT

Hugging Face

For more details: https://superbbenchmark.org/challenge

SUPERB Challenge

Different tasks have different metrics. How to evaluate the overall scores of an upstream model?

- Performance
  - $SUPERB\ Rank$: Consider the ranking in each task. Average the ranking over all tasks.
  - $SUPERB\ Score$: Normalizing the metric scores of all tasks into the same range. Average the normalized scores over all the tasks.
- Efficiency
  - number of Parameters
  - number of Multiply-ACcumulate operations (MACs)

The SUPERB team provides toolkit to evaluate

$$MACs = \max\{num(add) + num(sub), num(mul) + num(div)\}$$

- Optional: streaming or not, latency

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Last Team Meeting before Workshop

- Initially, I planned to have a team meeting in Singapore. But it looks like most people won't go to ICASSP (Singapore).
- How about the next meeting in the US (e.g., Baltimore) after ICASSP?
- Let's find a day for a team meeting.
- All the weekends after ICASSP before JSALT
  - **June 4, 5, 11, 12, 18, 19**
- Link for surveying a day for one-day team meeting in the U.S.: https://forms.gle/2eyhuJLPBVCsMjDP9 (let’s fill in now)

Team Meeting

- Weekly meeting team meeting for senior members
  - **All full-time senior members must attend.** Optional for senior members who is not full-time.
  - For logistic issues, quick synchronize
  - less than 30 mins
- The start time of the weekly meeting of senior members: https://www.when2meet.com/?15455670-Qejf3 (let's fill in now)

Other

- If you already have the dates for visiting Baltimore, please let me know. I already have the dates of Nigel, Diego, Shang-Wen.
- Please estimate your computing requirements and provide the estimation in the next weekly team meeting.
- Suggest 1-2 external lecturer(s) for the team's tutorial day. US-based lecturers are preferred.
  - Nigel volunteers to give a tutorial on prosody.
  - Other recommended speakers? Provide the names before May 1st.
- Suggest names of Plenary Lecturers for the Wednesday seminars during the workshop.
  - Lucas recommends Andre Martins.
  - Other recommended speakers? Provide the names before May 1st.

- Please put your slides here: https://drive.google.com/drive/folders/1cfOSC2kyNzndet58VEgahMqfanrZ_Vyb?usp=sharing