2026 LRAC Workshop

Advancing neural audio coding under joint resource constraints

Organizers: Wojcicki, Isik, Lechler, Balic, Yesilbursa, Zhang, Mack, Łaganowski (Cisco Systems)
Co-Organizers and Academic Partners: Watanabe (CMU), Kim (UIUC), Adi (HUJI)

May 4, 2026

LRAC 2026
WORKSHOP

ICASSP2026
Barcelona

IEEE Signal Processing Society

09:00 – 09:10 · 10 min

Opening Talk

The 2026 LRAC Workshop Introduction

Kamil Wojcicki, *Cisco Systems*

Why low-resource audio codecs?

1

Deployment needs

- limited bandwidth
- limited power / compute
- challenging connectivity

2

Why neural codecs

- high quality at 1–6 kbps
- better perceptual trade-offs
- learned generative priors
- universal tokenizers

3

Why LRAC

- common constraints
- common evaluation bench
- comparable results
- insight across bitrates and conditions

Low-resource is the real-world constraint. Neural codecs show promise. LRAC evaluates that promise.

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What's missing for real-world deployment?

Getting to a broadly deployable real-world solutions requires solving for concurrent constraints.

Compute

- endpoint budget: ≤0.7–2.6 GFLOP/s
- published systems often exceed it

Latency

- real-time target: ≤30–50 ms
- streaming + minimal look-ahead

Bitrate

- bandwidth constrained networks
- redundancy/FEC consumes bits

Robustness

- noise, reverb, and other distortions
- quality beyond clean-only benchmarks
- quality after transport, not just coding

The missing piece is joint optimization across: endpoint, latency, bitrate, and acoustic constraints.

Jointly addressing all of the above is underexplored — the gap LRAC aims to help fill.

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LRAC: a two-part initiative

2025 LRAC Challenge (concluded Oct 2025)

- First-of-its-kind benchmark under joint resource constraints
- Submissions: 15 submissions across two tracks (excluding baseline systems)
- Large scale crowdsourced evaluation
- Roughly 2:1 industry-academia split

2026 LRAC Workshop (today)

- Disseminates challenge outcomes + broader low-resource audio coding topics
- Over 90 registrations, roughly 50-50 academia-industry split
- Contributions: oral + poster sessions (9 archival, 2 non-archival; challenge + broader topics)
- Wider framing: keynote talks + panel discussion

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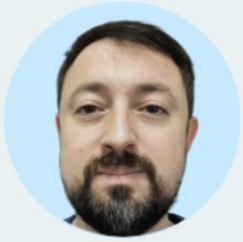
Meet the organizers

Shinji Watanabe
Associate Professor
Carnegie Mellon University, USA

Minje Kim
Associate Professor
University of Illinois Urbana-Champaign, USA

Yossi Adi
Assistant Professor
Hebrew University of Jerusalem, Israel

Kamil Wojcicki
Principal Engineer
Cisco Systems, Australia



Yusuf Isık
Technical Leader
Cisco Systems, UK

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Cisco Systems, Switzerland

Mansur Yesilbursa
AI Researcher
Cisco Systems, Poland

Guoqing Zhang
Principal Engineer
Cisco Systems, USA

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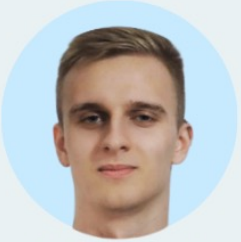
ML Engineer
Cisco Systems, Germany



Rafał Łaganowski
Software Engineer
Cisco Systems, Poland

Today's Program

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Morning Block

Time	Session	Duration	Agenda
09:00 – 09:10	**Opening Talk**	10 min	*Brief talk about the workshop by the organizers* **Presenter:** Kamil Wojcicki, *Cisco Systems*
09:10 – 09:55	**First Keynote**	45 min	*From Paper to Production: the Engineering and Standardization Challenges of Neural Speech Coding* **Presenter:** Jean-Marc Valin, *Google* **Chair:** Minje Kim, *UIUC*
10:00 – 10:20	**Challenge Overview**	20 min	*Challenge overview talk by the challenge organizers* **Presenter:** Kamil Wojcicki and Yusuf Isik, *Cisco Systems* **Chair:** Wolfgang Mack, *Cisco Systems*
10:20 – 10:50	**Coffee Break**	30 min	*Coffee break provided by the ICASSP organizers*
10:50 – 11:30	**Oral Presentations**	40 min	*Oral presentations by the respective winners of each LRAC Challenge track* **Track 1 Winner:** IRIS: Low-Complexity High-Efficiency Neural Network Codec for Real-Time Audio Transmission **Presenter:** Ziqian Wu, *ByteDance* **Track 2 Winner:** PR-Vocodec: Progressive Refinement Training for Low-Resource Neural Speech Coding and Enhancement **Presenter:** Ronghui Hu, *Nanjing University* **Chair:** Wolfgang Mack, *Cisco Systems*
11:30 – 12:15	**Second Keynote**	45 min	*Design Choices and Effective Evaluation of Modern Speech and Audio Codecs Based on Neural Networks* **Presenter:** Nicola Pia, *Fraunhofer IIS* **Chair:** Wolfgang Mack, *Cisco Systems*

Today's Program

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Lunch Break

Time	Session	Duration	Agenda
12:15 – 14:15	**Lunch Break**	120 min	*Break for self-arranged lunch. Lunch will not be provided by the workshop.*

Afternoon Block

Time	Session	Duration	Agenda
14:00 – 14:15	**Poster Setup**	15 min	*Time allocated for poster setup. Please note the overlap with end of lunch break.* **Chair:** Mansur Yesilbursa, *Cisco Systems*
14:15 – 15:45	**Poster Session**	90 min	*11 poster presentations across 4 areas. Authors free to roam after 60 min.* **Chair:** Mansur Yesilbursa, *Cisco Systems*
15:45 – 16:15	**Coffee Break**	30 min	*Coffee break provided by the ICASSP organizers*
16:15 – 17:00	**Third Keynote**	45 min	*In Search of Better Audio Codecs: Requirements and Constraints for Modern Audio Codecs on the Internet* **Presenter:** Cullen Jennings, *Cisco Systems* **Chair:** Ivana Balic, *Cisco Systems*
17:00 – 18:00	**Panel Discussion**	60 min	*Are Neural Codecs Ready for Low-Resource Reality? Potentials and Pitfalls in the AI Era.* **Host:** Minje Kim, *UIUC* **Panelists:** Nicola Pia, *Fraunhofer IIS*; Jean-Marc Valin, *Google*; and Cullen Jennings, *Cisco Systems*

Poster Session at a Glance

Challenge Entries (PA1)

- IRIS — Low-Complexity High-Efficiency Neural Network Codec for Real-Time Audio Transmission, *Wu et al.*
- PR-Vocodec — Progressive Refinement Training for Low-Resource Neural Speech Coding and Enhancement, *Hu et al.*
- KD-Vocodec — A Low-Complexity Model for Joint Speech Coding and Enhancement Using Knowledge Distillation, *Xu et al.*
- VoCodec — An Efficient Lightweight Low-Bitrate Speech Codec, *Yang et al.*
- NanoCodec — Towards Low Bitrate and Low Complexity Real-Time Neural Audio Codec, *Li et al.*
- PhoenixCodec — Taming Neural Speech Coding For Extreme Low-Resource Scenarios, *Wan et al.*

Challenge Design (PA2)

- Low-Resource Audio Codec (LRAC): 2025 Challenge Description, *Wojcicki et al.*

Broader Impacts (PA3)

- Exploring Disentangled Neural Speech Codecs from Self-Supervised Representations, *Aihara at al.*
- Attention-Guided Audio Compression for Multimodal LLMs, *Rane et al.*

Non-Archival (PA4)

- Personalized Low-Bitrate Coded Speech Restoration Via Embedding Conditioning And Cluster-Based Model Selection, *Özgünay et al.*
- How Training Data Affects Speech-Enhancing Neural Codecs: A Data-Centric Study Under Low-Bitrate Constraints, *Raczyński et al.*

Acknowledgments

- Participants, keynote speakers, panelists, authors and reviewers
- IEEE SPS Technical Committees: SLTC and AASP TC
- IEEE SPS incl. Challenge Program
- ICASSP Organizers and Satellite Workshop Chairs
- Cisco’s sponsorship

Q&A

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