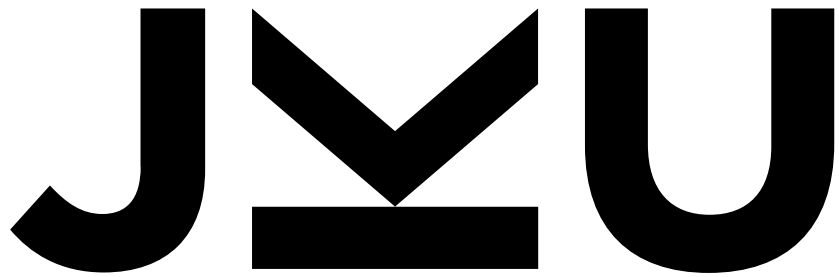

JOHANNES KEPLER
UNIVERSITY LINZ

UE MLPC 2025: CHALLENGE RESULTS

Tara Jadidi, Florian Schmid, Paul Primus

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Institute of Computational Perception

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Menu for Today

- Look back at the Challenge Task
- Team Presentations
- Challenge Results
- Wrap up the Project

WHERE WE ARE

Project Schedule

		Date/Deadline
Meeting 1	Introduction, explain Tasks 0 and 1	March 10 ✔
Task 0	Form teams	March 24 ✔
Task 1	Data Annotation	March 24 ✔
Meeting 2	Release dataset, explain Task 2	April 7 ✔
Task 2	Data Exploration	April 24 ✔
Meeting 3	Discuss results, explain Task 3	April 28 ✔
Task 3	Classification Experiments	May 22 ✔
Meeting 4	Present results, release test data, explain Task 4	May 26 ✔
Task 4	The Challenge	June 19 ✔
Meeting 5	Final presentations	(12:00!) June 23 ◀

RECAP: CHALLENGE TASK

A Customer Approaches KIAL

The customer wants to monitor **urban noise pollution**. Their aim is to:

- Understand which acoustic sources contribute most to the noise pollution.
- Quantify their individual impact.
- Develop countermeasures for high-impact sources.

A Customer Approaches KIAL

Goal: Detect the *temporal occurrence* of 10 common urban noise events:

> **Speech, Dog Bark, Rooster Crow, Shout, Lawn Mower, Chainsaw, Jackhammer, Power Drill, Horn Honk, Siren**

This is a typical **Sound Event Detection (SED)** task:

- **What** sound occurred?
- **When** did it happen?

The Customer's Secret Test Set

To select the best-performing Sound Event Detection (SED) system, the customer:

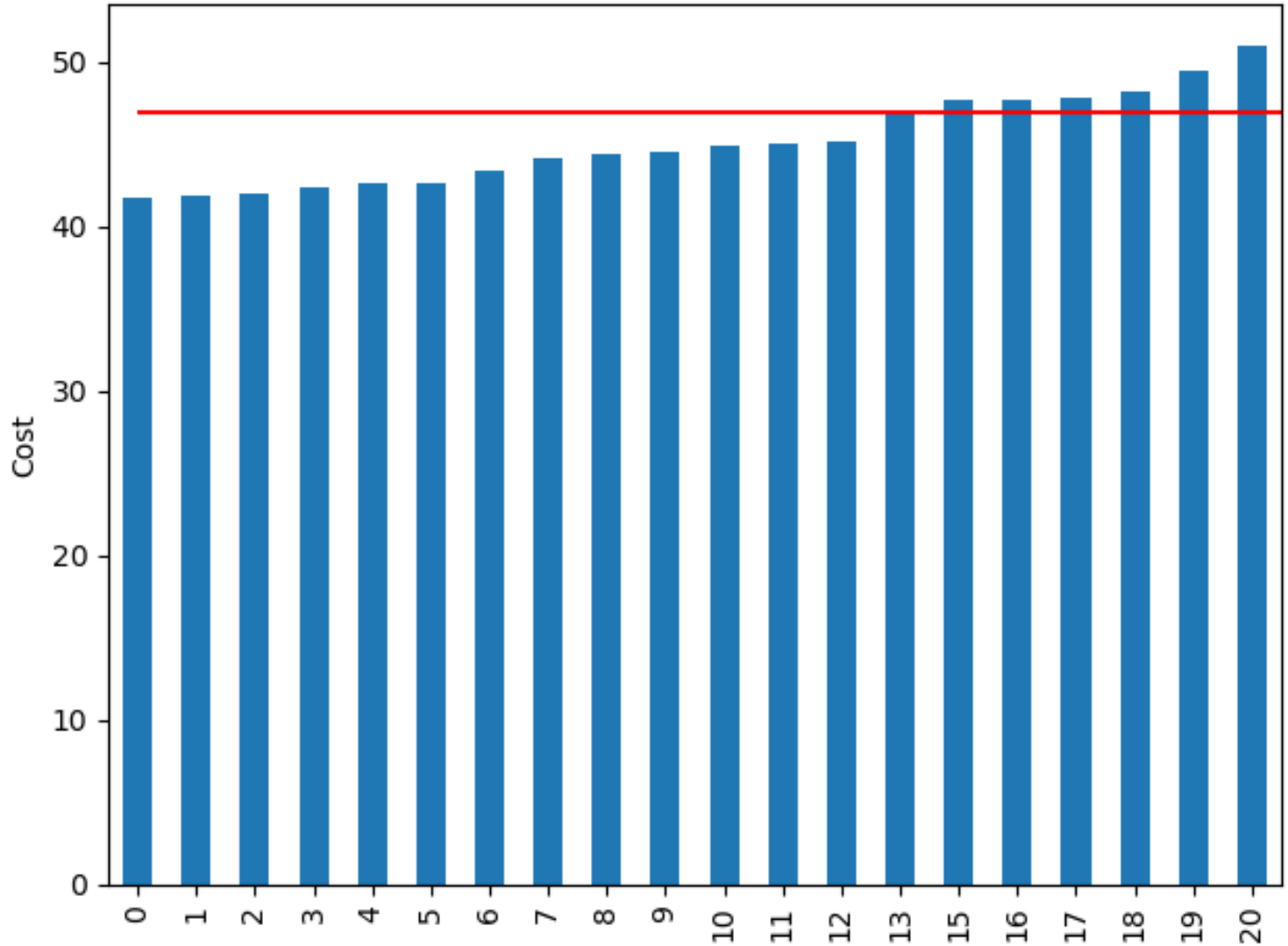
- Provides a **test set** of audio recordings *without annotations*.
- Evaluates submitted systems based on a **cost-based metric**.
- Awards the contract to the system with the **lowest total cost**.

Cost-Based Evaluation

- Each sound class has **custom costs** for FP and FN.
- TP and TN incur **zero cost**.
- Final score: *average cost per minute*, averaged across all classes.

Class	TP	FP	TN	FN
Speech	0	1	0	5
Dog Bark	0	1	0	5
Rooster Crow	0	1	0	5
Shout	0	2	0	10
Lawn Mower	0	3	0	15
Chainsaw	0	3	0	15
Jackhammer	0	3	0	15
Power Drill	0	3	0	15
Horn Honk	0	3	0	15
Siren	0	3	0	15

A Sneak Peek at the Results



TEAM PRESENTATIONS

Team Presentations

- Some groups will present their main findings
- Around 5 minutes for the presentation, then a bit of time for questions
- Team presentations and discussions will not be recorded!

Team Presentations

- Team Bed
- Team Repeat
- Team Observe
- Team Toothpaste
- Team Fumbling

HONOURABLE MENTIONS

Unique Approaches

Some more teams with unique approaches . . .

- **Team Tenuous** for the thorough evaluation of cost and cost thresholding.
- **Team General** for trying to improve the BiGRU architecture with a self-attention layer.
- **Team Unbecoming** for using a 1D-CNN and cost-specific loss.
- **Team Nice** for trying a conformer-based architecture.
- and many, many more interesting ideas . . .

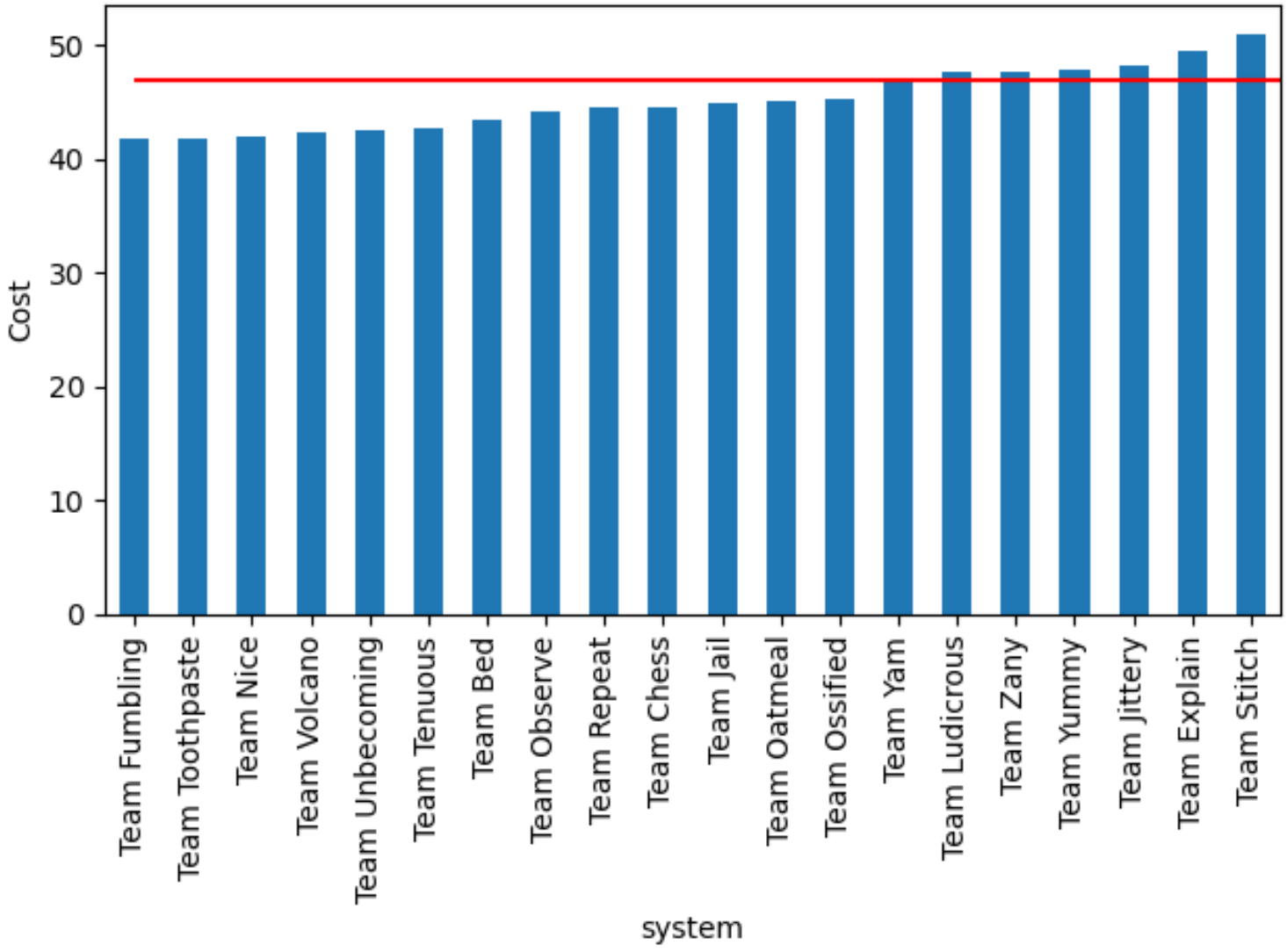
CHALLENGE RESULTS

Top 3 Ranked Submissions

rank	team	cost
1.	Team Fumbling	41.813723
2.	Team Toothpaste	41.833841
3.	Team Nice	41.998620
4.	Team Volcano	42.329137

Table: Top-3 ranked Teams in the MLPC Challenge

Top 20 Ranked Submissions



SOME ADMINISTRATIVE THINGS

Grades

- Grading of reports will be finalized in the next weeks
- We will send an announcement before transferring the grades to KUSSS

Other Projects @ CP

- Did you like the project?
- We offer similar (and other) projects for your Bachelor and Master Thesis!
- You can find topics and projects on our website:
  `https://www.jku.at/en/institute-of-computational-perception/teaching/theses-and-projects/`

Other Courses @CP

- Not looking for a thesis / project (yet)?
- We also offer courses you might be interested in, e.g.,
  - Probabilistic Models (WS)
  - Reinforcement Learning (WS)
  - Artificial Intelligence (WS)
  - Music and Audio Processing (SS)
  - Machine Learning and Audio: A Challenge (SS)

Thank You for participating in the project!

Thank You for all the effort you put into it!

Thank You for the pleasant atmosphere!