DCASE2022 CHALLENGE

Monitoring Task 2

Unsupervised Anomalous Sound Detection for Machine Condition Monitoring Applying Domain Generalization Techniques

Monitoring Task 2

DCASE2022

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HITACHI Inspire the Next

Doshisha University

Google

NTT

Task scope

Monitoring
Task 2

◻ Anomalous Sound Detection (ASD)

Determine if a machine is **normal** or **anomalous** from sound

Background photo created by fanjianhua - www.freepik.com
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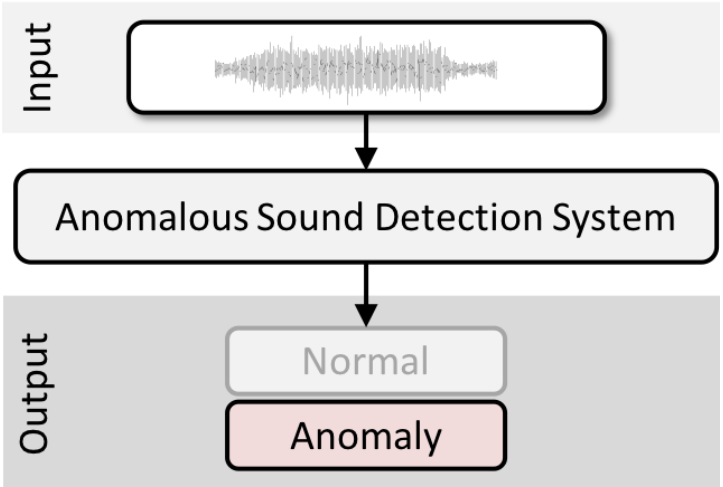


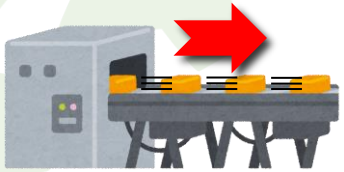
Challenge

Monitoring
Task 2

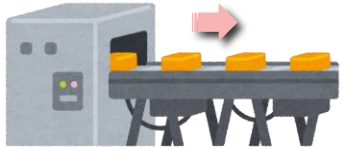
How can we handle domain shifts?

Domain shifts : Differences in machine's operational states or the environment

Winter
(source domain)



Summer
(target domain)



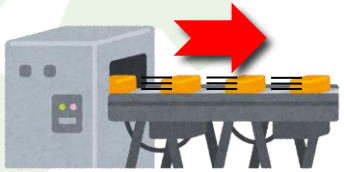
Domain shifts can significantly degrade the detection performance

Challenge

How can we handle domain shifts?

Domain shifts : Differences in machine's operational states or the environment

Winter
(source domain)



Summer
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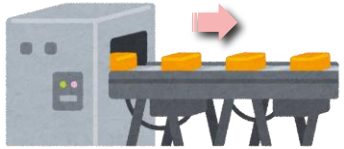


adaptation

Domain shifts can significantly degrade the detection performance

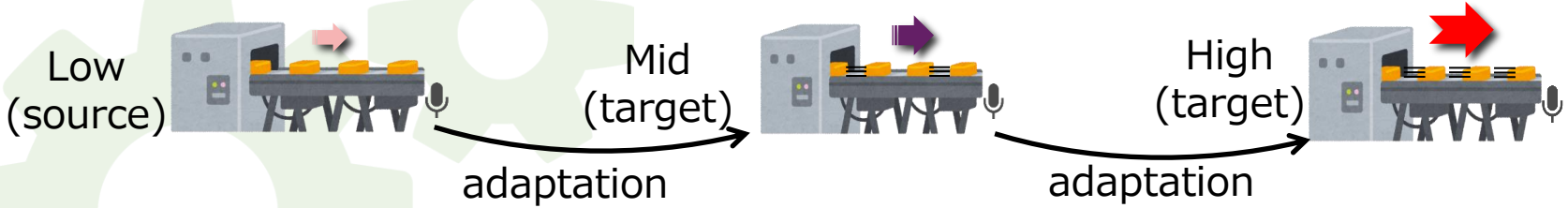
Adaptation of the model can be useful (DCASE2021 Task 2)

Focus in 2022

Monitoring
Task 2

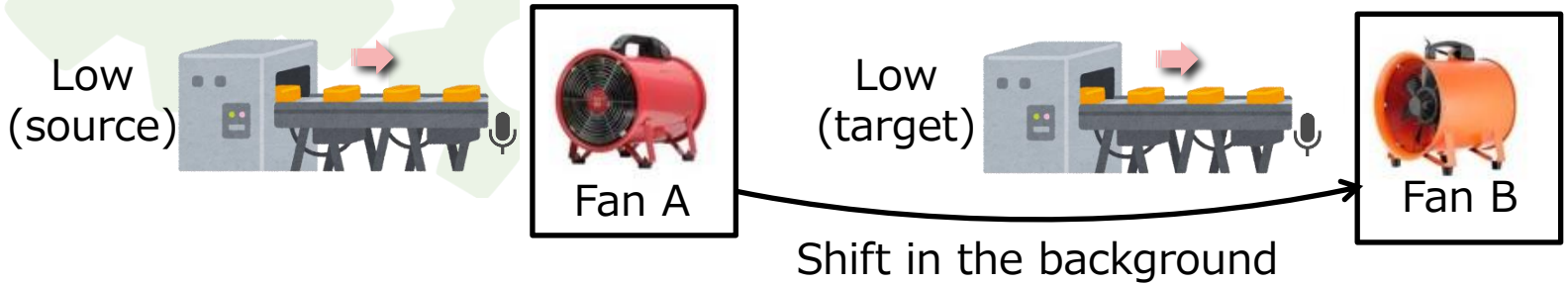
Can we handle domain shifts without adaptation?

Case1: Domain shifts can occur frequently



Adaptation every time can be costly

Case2: Domain shifts can be hard to notice

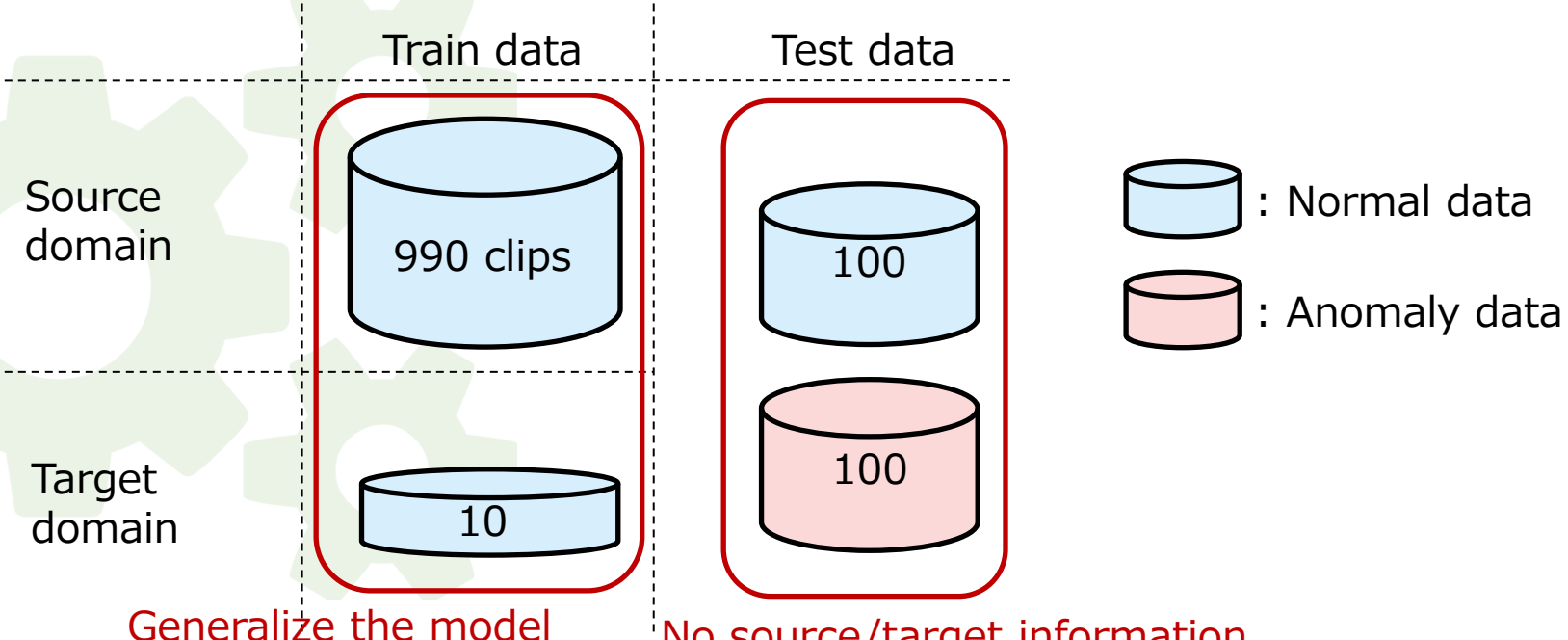


Adaptation is difficult if shifts are hard to notice

Task in 2022: Domain generalization

Monitoring
Task 2

Can we handle domain shifts by generalizing the model?



Generalize the model

No source/target information
Detect anomalies with a generalized model that works regardless of the domain

Task2 related 6 papers will be presented in Workshop

Enjoy Workshop!

- I. Nejjar+, “DG-MIX: Domain Generalization for Anomalous Sound Detection Based on Self-supervised Learning”
- L. Kai+, “Unsupervised Anomalous Sound Detection for Machine Condition Monitoring Using Temporal Modulation Features on Gammatone Auditory Filterbank”
- K. Dohi+, “MIMII DG: Sound Dataset for Malfunctioning Industrial Machine Investigation and Inspection for Domain Generalization Task”
- S. Venkatesh+, “Improved Domain Generalization via Disentangled Multi-task Learning in Unsupervised Anomalous Sound Detection”
- K. Mai+, “Explaining the Decisions of Anomalous Sound Detectors”
- Y. Deng+, “Ensemble of Multiple Anomalous Sound Detectors”