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ECCV DeeperAction Challenge

UrbanPipe Track：Fine-grained Video Anomaly Recognition

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Outline

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1. Motivation
2. Dataset Introduction
3. UrbanPipe Track
4. Track Result

Part 1

Motivation

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Why to do?

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- Current tasks are mainly coarse-grained, single-labeled and based on human actions

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Why to do?

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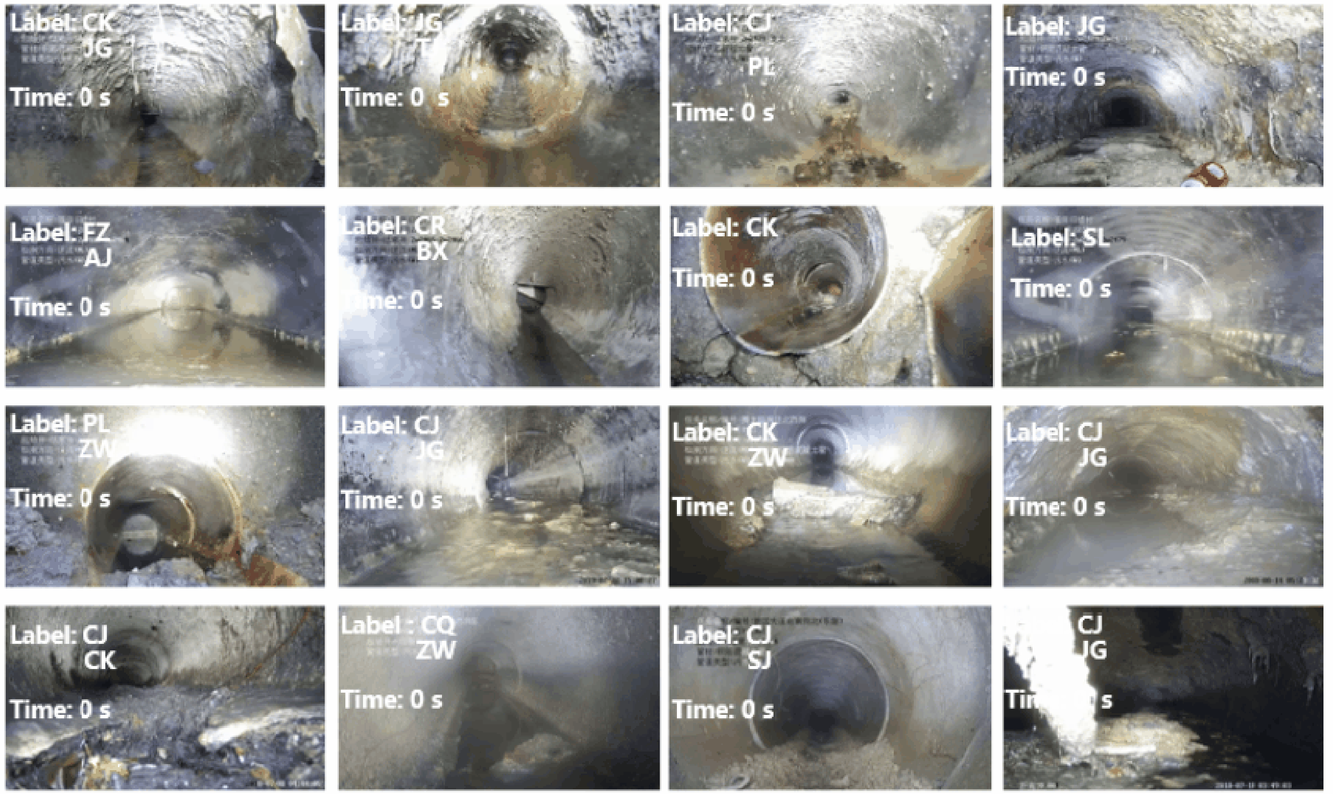
- Industrial applications are fine-grained, multi-labeled and domain-relevant



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Why to do?

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Well-studied Tasks

- Coarse-grained.
- Single-labeled.
- Mainly human actions.

shift

Industrial applications

- Fine-grained.
- Multi-labeled.
- Domain-relevant.

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Part 2

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Dataset Introduction

Data Collection & Annotation

- UrbanPipe is collected from QV Inspection devices and annotated by engineers

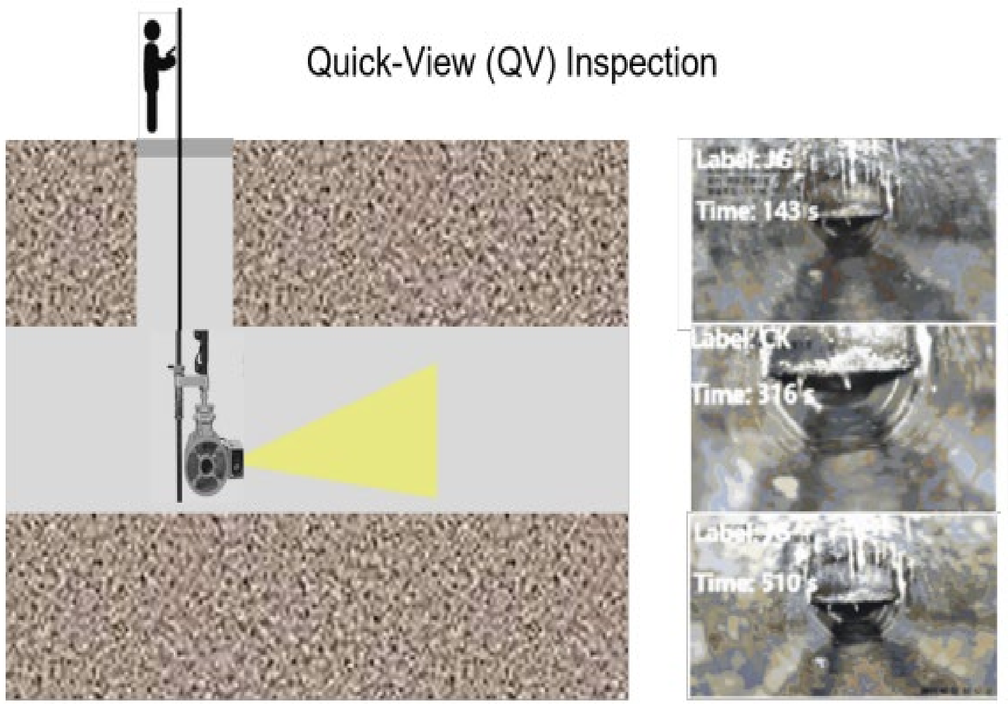

Fig.1: Pipe Quick View(QV) Inspection.

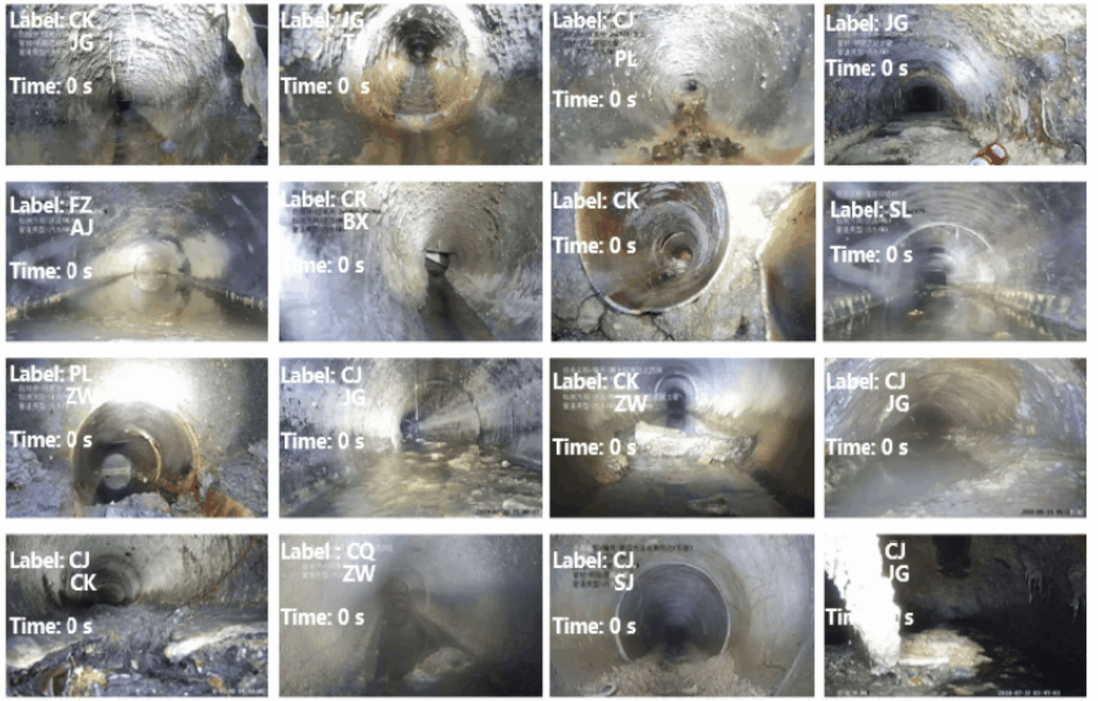

Fig.2: Anomaly Examples in Our UrbanPipe Dataset.

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Dataset Statistics

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❑ **9.6k** real-world urban pipe videos are collected for anomaly recognition

Videos Collection

- Total duration: 55h
- Video duration: 0.7s to 177.4s
- Average duration: 20.7s

Defect Annotation

- **1** normal class and **16** defect classes
- Label number of each video: **1 to 5**
- Average Label number: **1.4**

● Fine-grained

● Multi-labeled

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Dataset Statistics

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- **Long-tailed** distribution over annotation

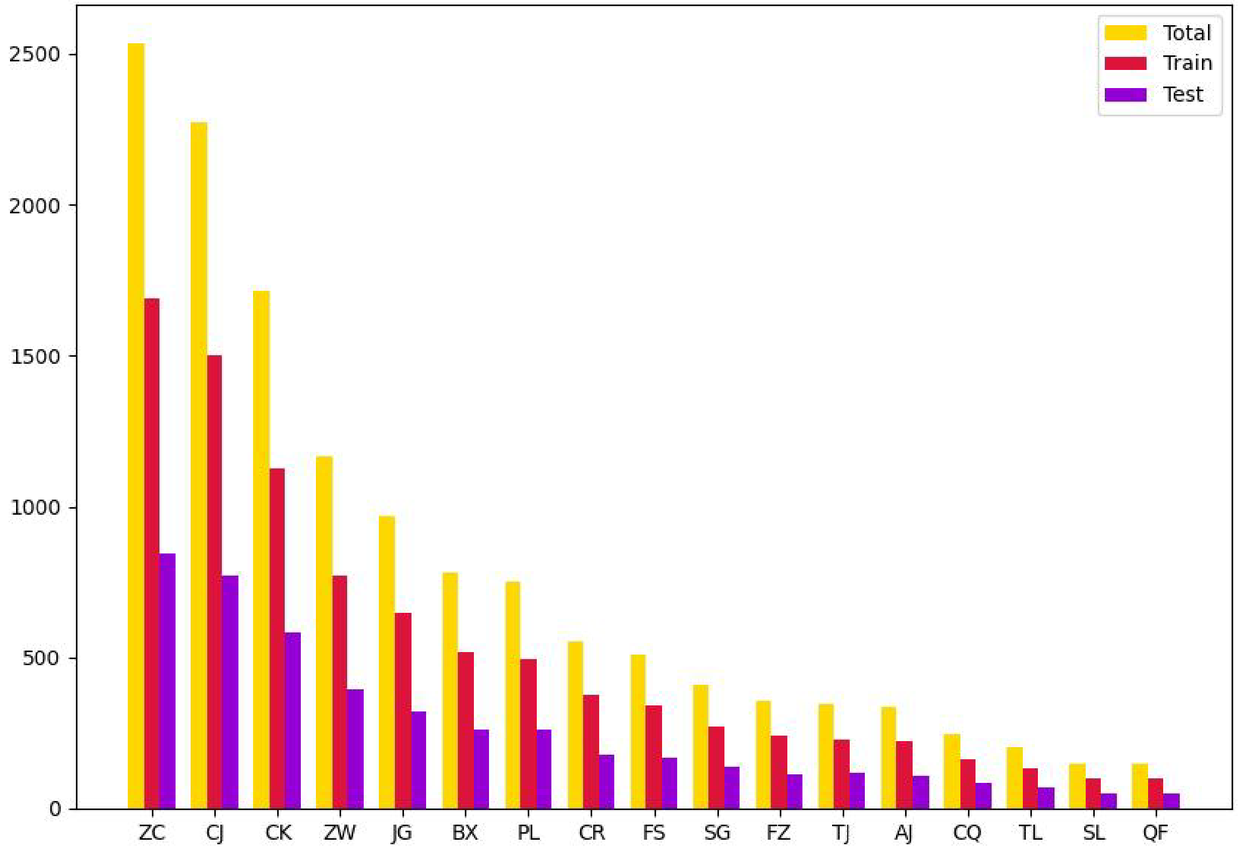

Fig.3: Data Distribution of UrbanPipe.

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Part 3

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UrbanPipe Track

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UrbanPipe Track

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❑Goal

Predicting the categories of pipe defects in an untrimmed video.

❑Metric

Using Average Precision (AP) to evaluate the recognition results on each defect category. Then we average AP over all the categories to obtain mAP.

UrbanPipe Track

- Development Phase: 2021.06.01-2021.08.31
- Testing Phase: 2021.09.01-2021.09.12

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Part 4

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Track Result

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Statistics

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- **Valid Participants:** 114
- **Valid Teams:** 6 (Development Phase) + 37 (Test Phase)

Test Set (Mean Average Precision - mAP)				
#	User	Entries	Date of Last Entry	mAP ▲
1	AIPRIME	10	08/31/22	72.930000 (1)
2	Melody	26	08/31/22	72.923000 (2)
3	Cai	10	08/31/22	71.634000 (3)

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1st Place Winners

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Technical Report of UrbanPipe Challenge Track on Fine-grained Video Anomaly Recognition

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2nd Place Winner

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UrbanPipe Track on Fine-grained Video Anomaly Recognition Technical Report

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西安電子科技大學
XIDIAN UNIVERSITY

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3^{rd} Place Winner

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The Solution of USTC-NERCSLIP team for UrbanPipe Track on Fine-grained Video Anomaly Recognition

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University of Science and Technology of China

浙江大学
ZHEJIANG UNIVERSITY

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Thanks !

Homepage: https://deeperaction.github.io/tracks/urbanpipe/