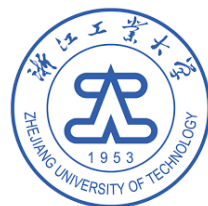


# Vision – Visualization Communication Report



Tong Li



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# Outline

- **Video × Vis**

- Pros. and Cons.

- **Related Work**

- OD Vis

- ER Vis

- HPE Vis

- **Our Work**

- Background and Challenge

- Hierarchical Task Analysis

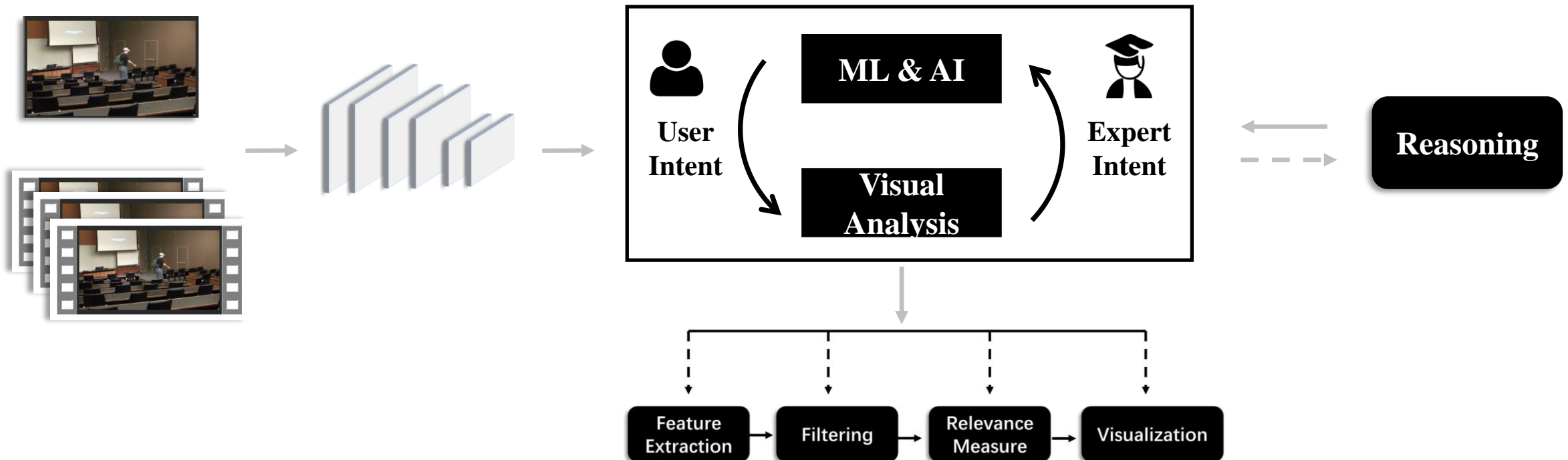
- Workflow

- Case Demonstration

- Discussion

1001

- ✓ **Performance:** **Strong** Computational and Comprehension Skills
- × **Manual Inspection:** **Labor-intensive** Tasks
- × **Machine Intelligence:** **Inaccurate** Results
- ✓ **Visibility:** **Improve** the visibility of video content.
- ✓ **Interpretability:** **Improve** the interpretability of video semantic understanding models.



# Outline

- Video ✕ Vis

- Pros. and Cons.

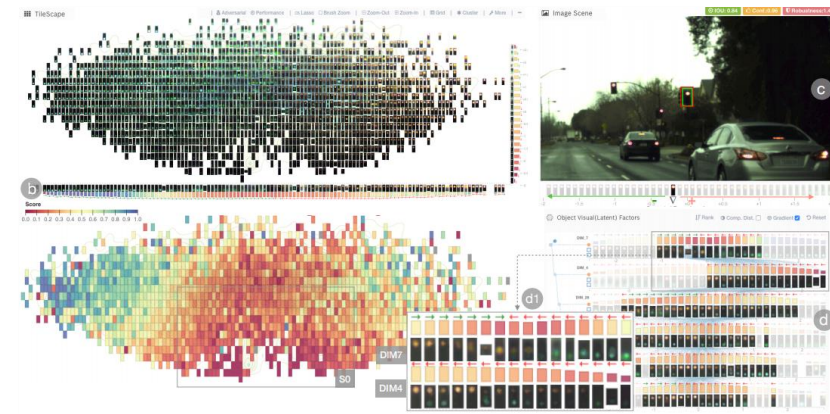
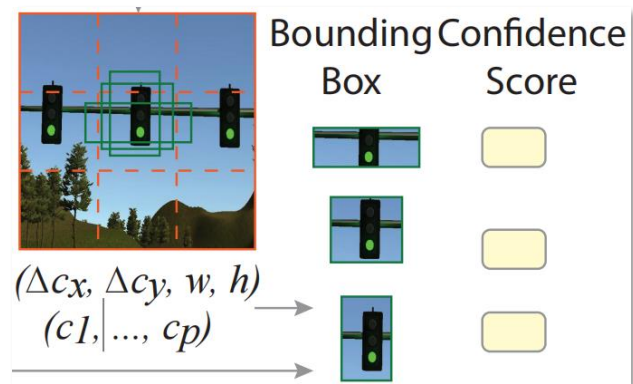
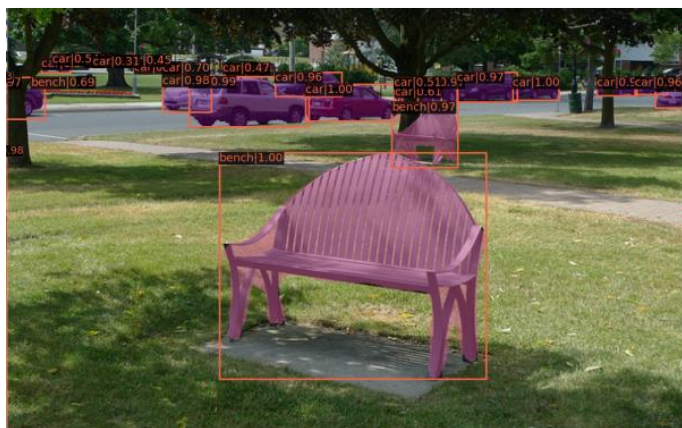
- Related Work

- OD Vis
  - ER Vis
  - HPE Vis

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  - Case Demonstration
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# Object Detection / Semantic Segmentation ✕ VIS



TVCG, 2020 [1]

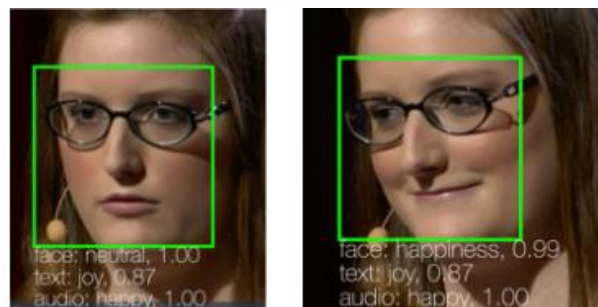
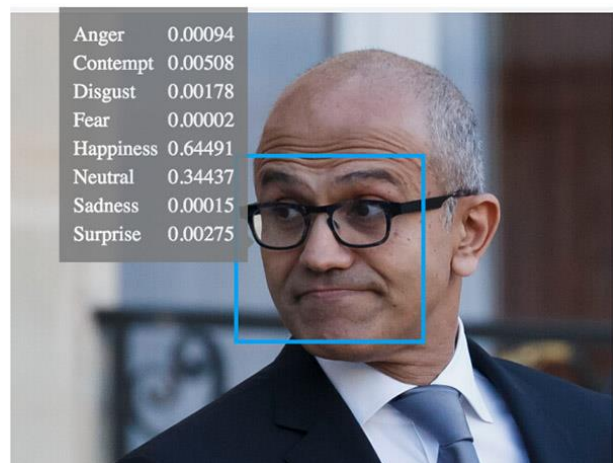
- ✓ Scene
- ✓ Certain Objects



TVCG, 2021 [2]

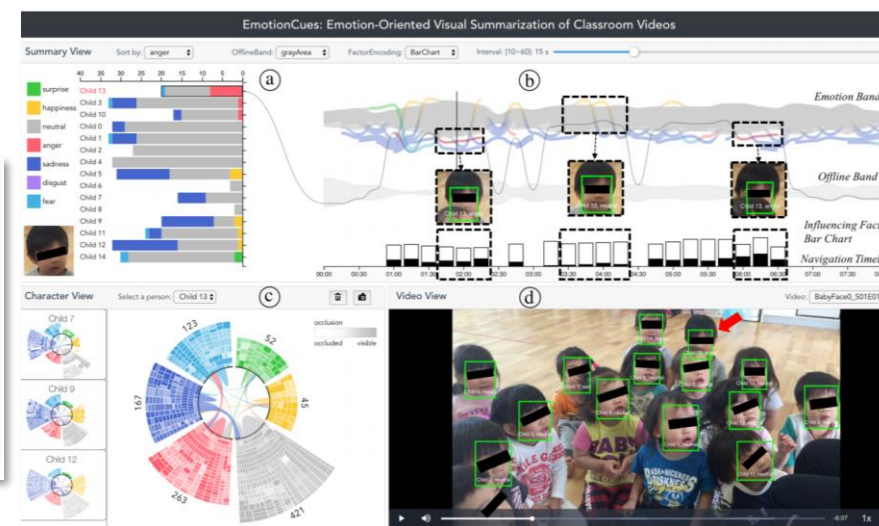


# Emotion Recognition ✕ VIS



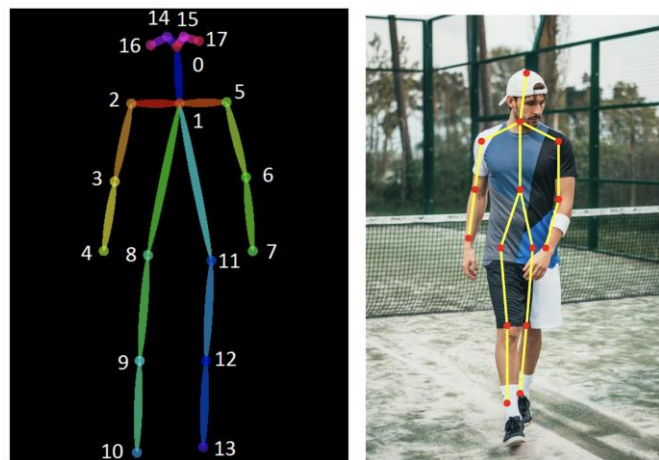
TVCG, 2019 [3]

- ✓ Human Face
- ✓ Clear Shot

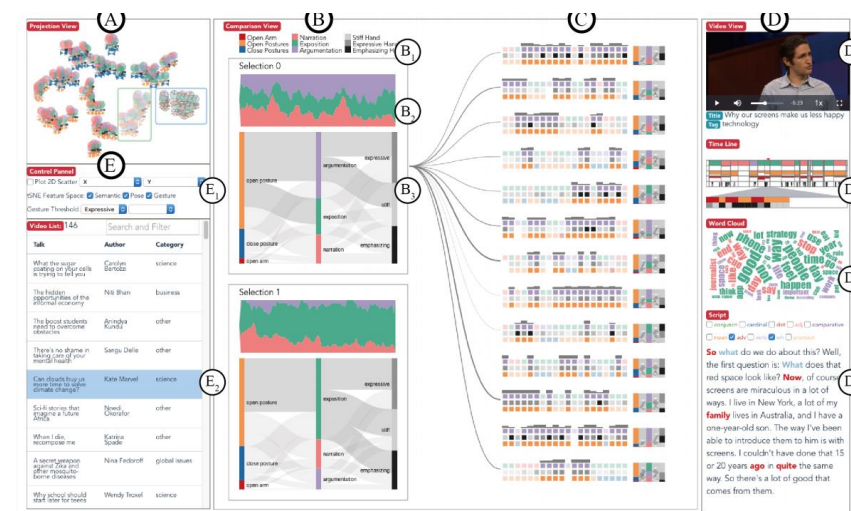
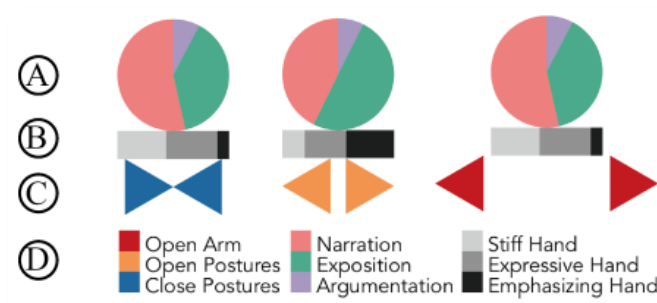


TVCG, 2020 [4]

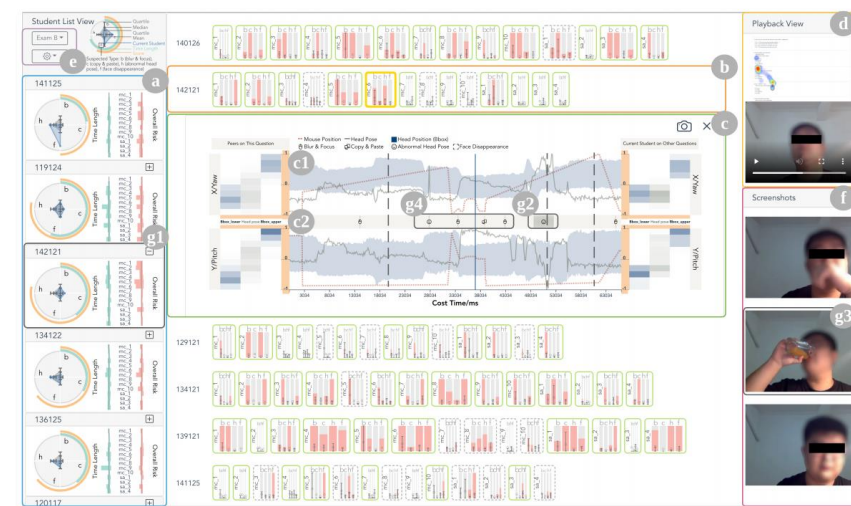
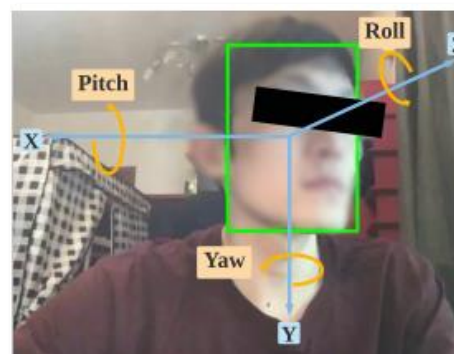
# Human Pose Estimation ✕ VIS



- ✓ Skeleton, Keypoints, Pose
- ✓ Body Expression



TCVG, 2018 [5]



CHI, 2021 [6]

# Outline

- Video ✕ Vis

- Pros. and Cons.

- Related Work

- OD Vis
  - ER Vis
  - HPE Vis

- Our Work

- Background and Challenge
  - Hierarchical Task Analysis
  - Workflow
  - Demo
  - Case Demonstration
  - Discussion



# Surveillance Video

## □ Data Challenge

Big Data、Uneven Quality

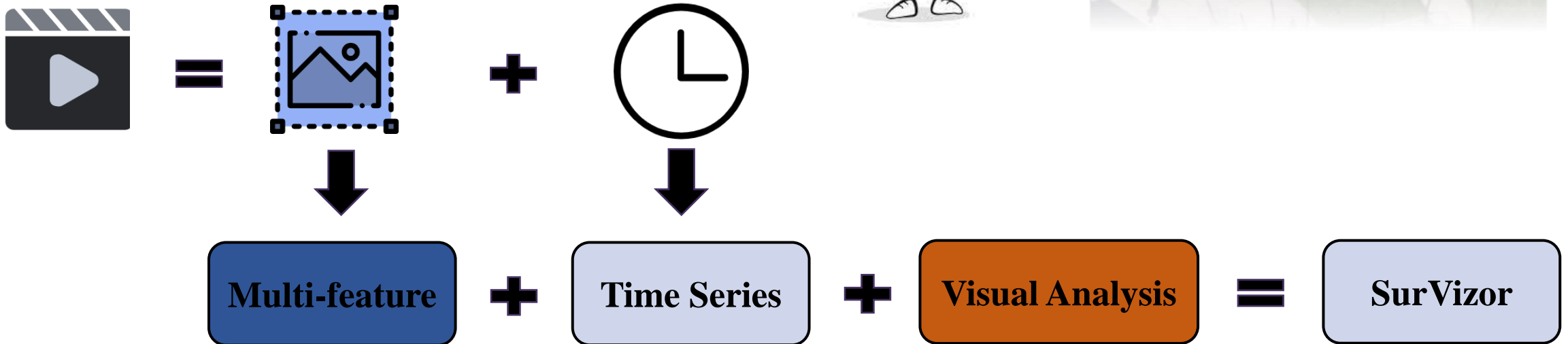
Noise Data

Loose Structures or Without Story Units

## □ Analytics Goal

Reduce the time of reviewing videos.

Understand video with low cost.



# SurVizor: Hierarchical Task Analysis

## □ T1. Data Processing

T1.1. Collect Data

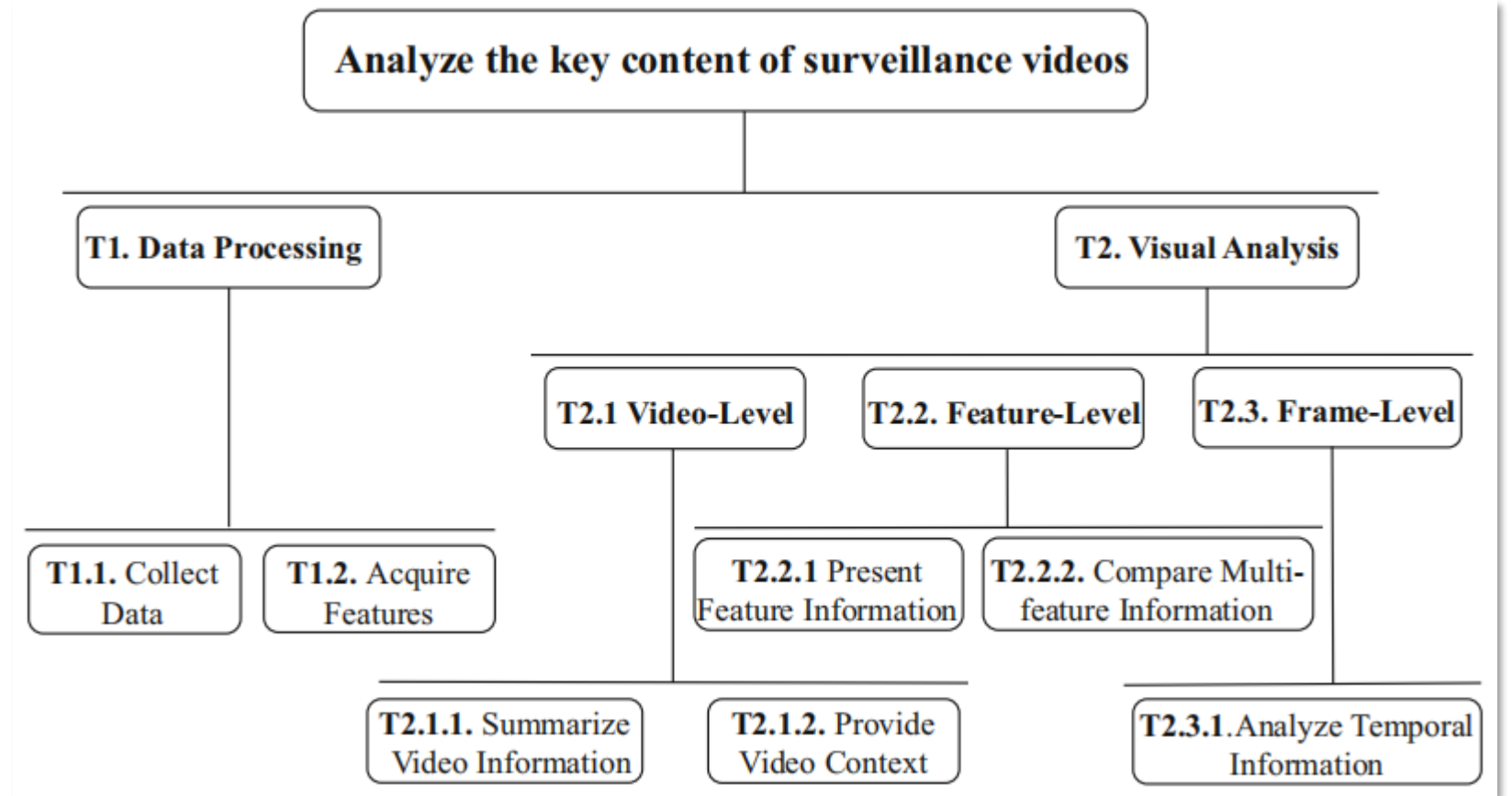
T1.2. Acquire Features

## □ T2. Visual Analysis

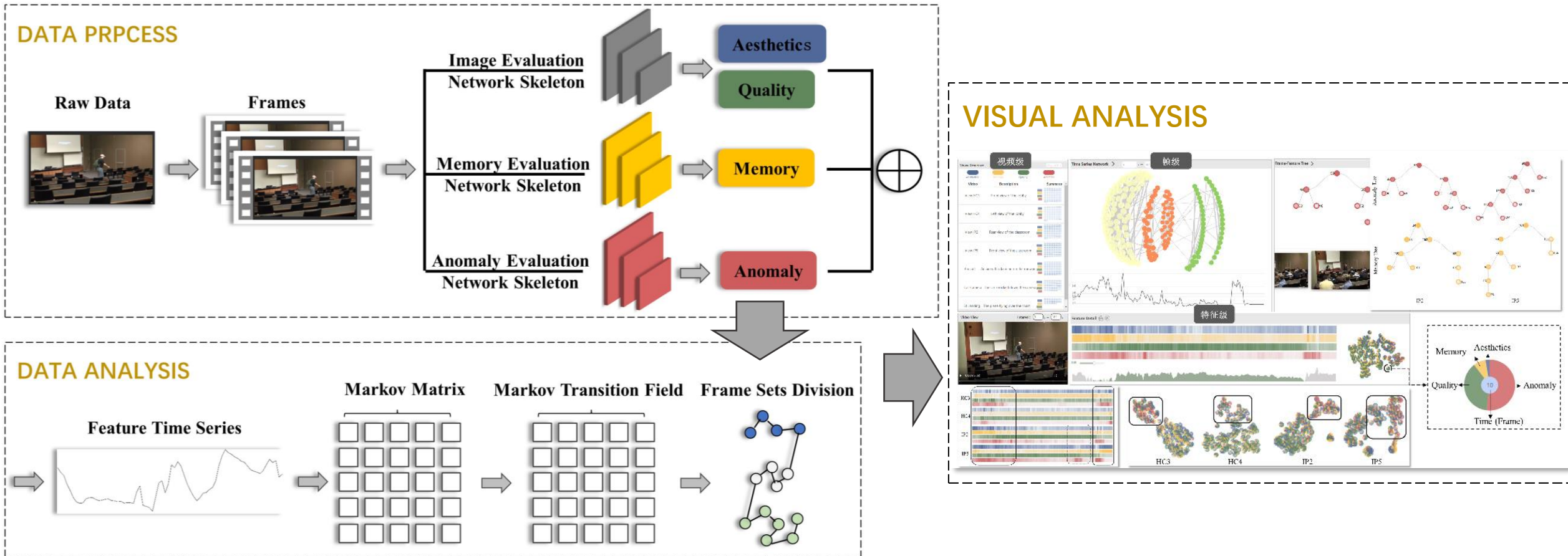
T2.1. Video-Level

T2.2. Feature-Level

T2.3. Frame-Level



# SurVizor: Workflow



# SurVizor: Case Demonstration

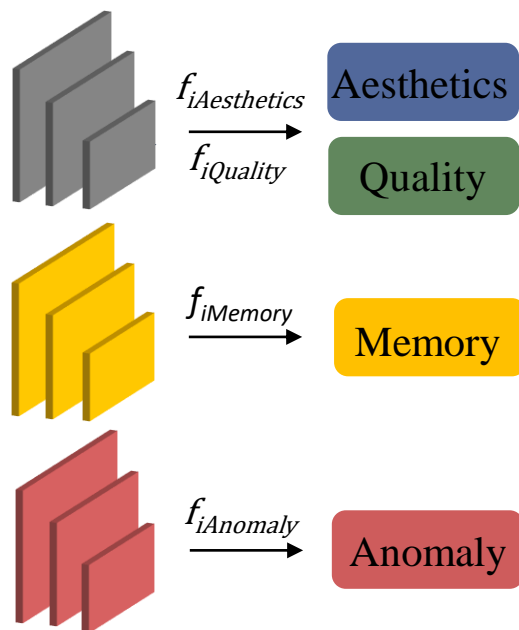
- ❑ **Location: Campus - Classroom**
- ❑ **Duration: 5mins**



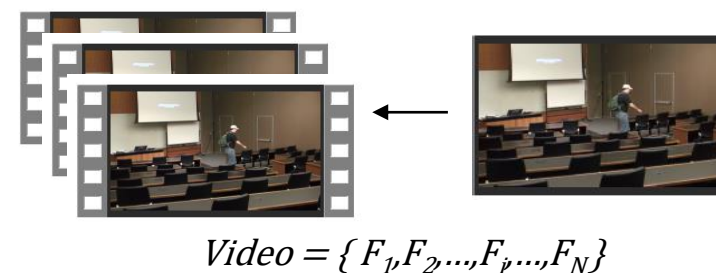
Guodao Sun, Tong Li, and Ronghua Liang. "SurVizor: visualizing and understanding the key content of surveillance videos."  
Journal of Visualization. 2021.

# SurVizor: Discussion

## Feature Selection



## Dynamic Sampling





## References

- [1] L. Guo, L. Zou, et al. "**VATLD**: A Visual Analytics System to Assess, Understand and Improve Traffic Light Detection." IEEE Transactions on Visualization and Computer Graphics. 2020.
- [2] T. Tang, Y. Wu, et al. "**VideoModerator**: A Risk-aware Framework for Multimodal Video Moderation in E-Commerce." IEEE Transactions on Visualization and Computer Graphics. 2021.
- [3] H. Zeng, X. Wang, et al. "**EmoCo**: Visual Analysis of Emotion Coherence in Presentation Videos." IEEE Transactions on Visualization and Computer Graphics. 2019.
- [4] H. Zeng, X. Shu, et al. "**EmotionCues**: Emotion-oriented Visual Summarization of Classroom Videos." IEEE Transactions on Visualization and Computer Graphics. 2020.
- [5] A. Wu and H. Qu. "Multimodal Analysis of Video Collections: Visual Exploration of **Presentation Techniques** in TED Talks." IEEE Transactions on Visualization and Computer Graphics. 2018.
- [6] H. Li, M. Xu, et al. "A Visual Analytics Approach to Facilitate the Proctoring of **Online Exams**." Proceedings of CHI Conference on Human Factors in Computing Systems. 2021.