

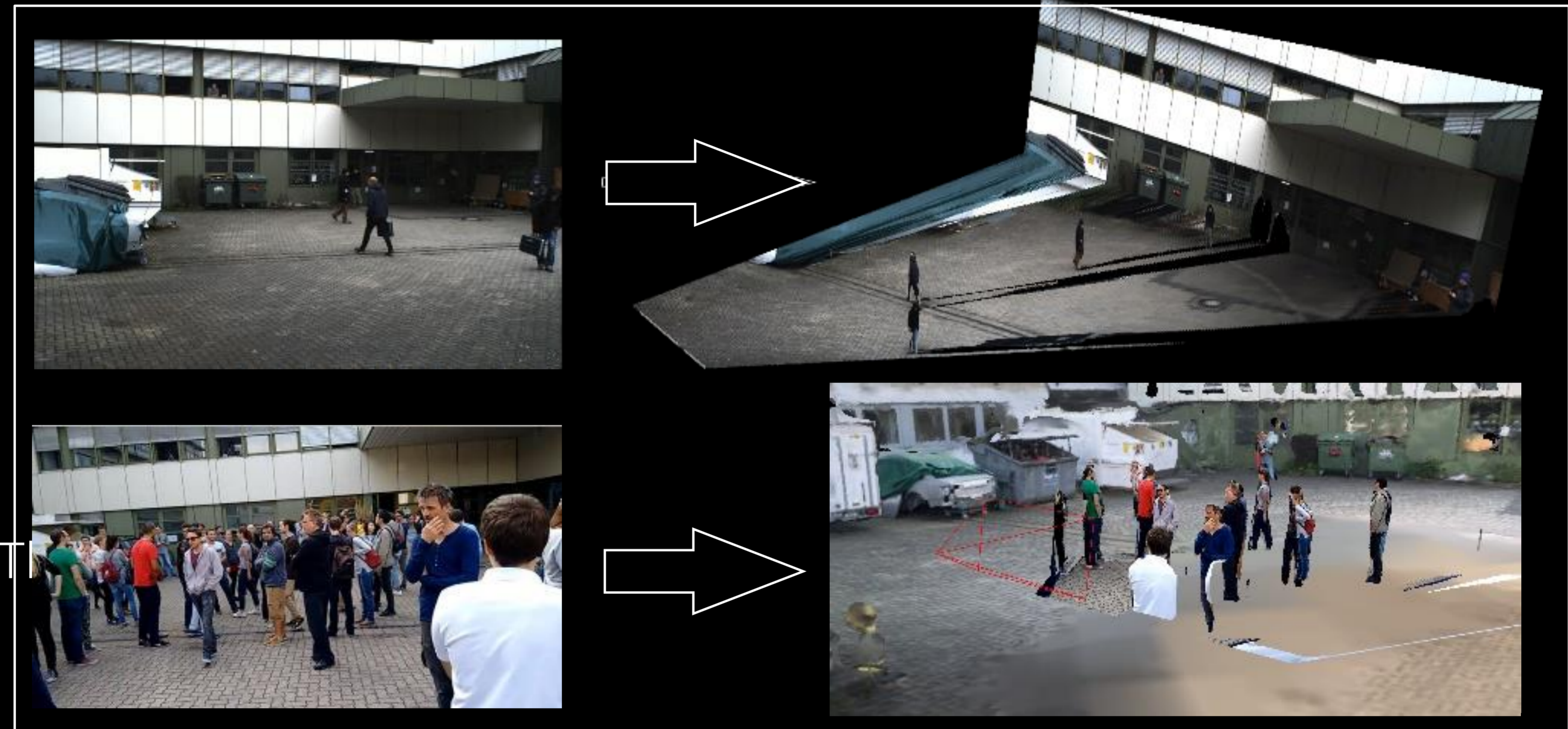
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In criminal investigations, investigators often have to analyze a vast amount of witness and surveillance footage from a specific incident. We propose an approach to fuse multiple video sources into a common context by reconstructing the crime scene and projecting all available sources spatially and temporally aligned into it. Subsequently, the scene can be interactively explored with visual analytics support. The pipeline consists of three main steps: The reconstruction of a static environment, the transformation of videos to 4D point clouds and the visualization of all components, including automatic object and person detections.

Input: Video footage from surveillance cameras, drones, mobile cameras recorded after or during an incident.



Static 3D scene with all camera locations (geo-registered)



Per frame depth estimation (temporal reconstruction)

Below is the final result of the reconstruction: the interactive 4D crime scene investigation interface.

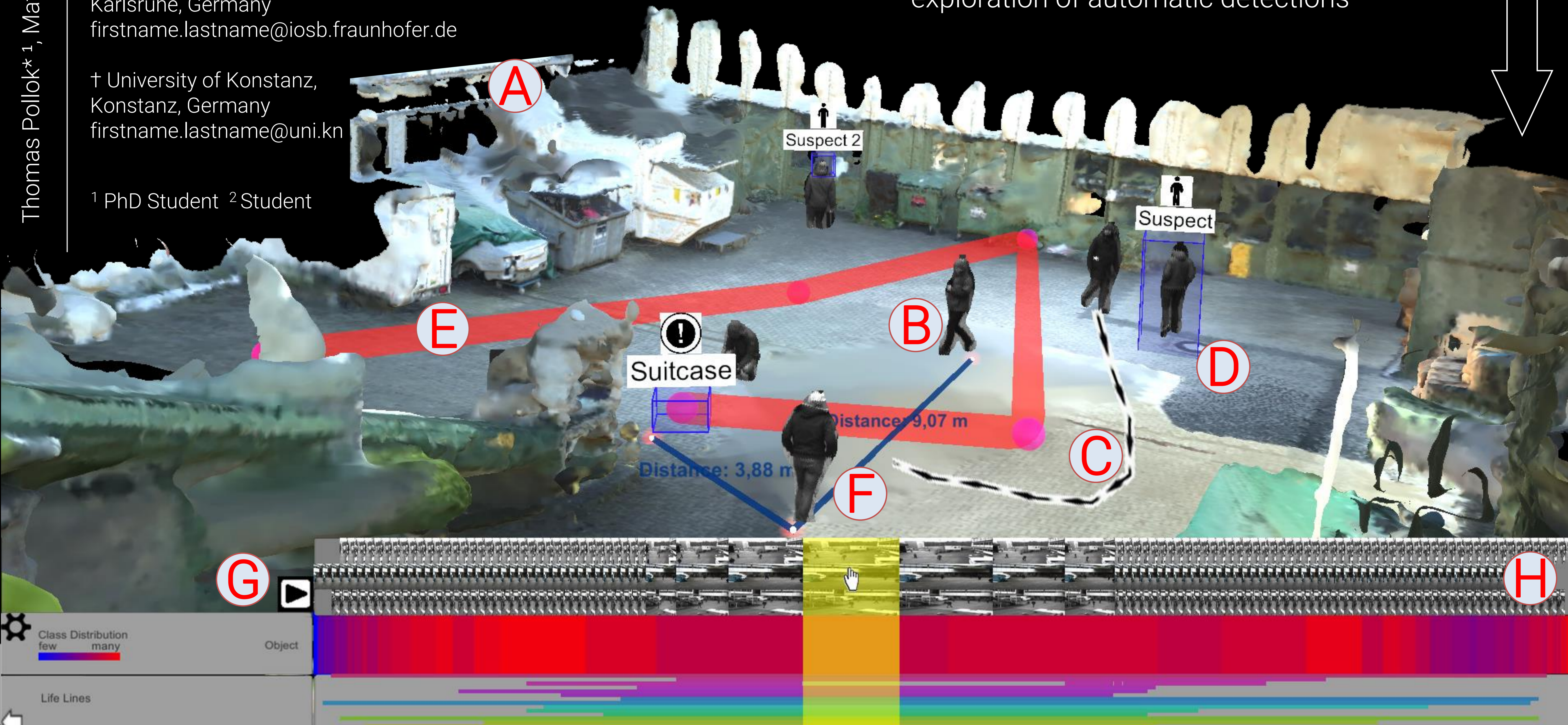


- (A) Reconstructed static surface mesh
- (B) Embedded dynamic object reconstruction
- (C) Movement trajectory of a dynamic object
- (D) Custom user annotations
- (E) Animation path for custom user annotations
- (F) Interactive distance measurement tool
- (G) Interactive replay and temporal navigation
- (H) Supportive visualization for temporal exploration of automatic detections

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