Automated Video Analytics in Traffic Safety

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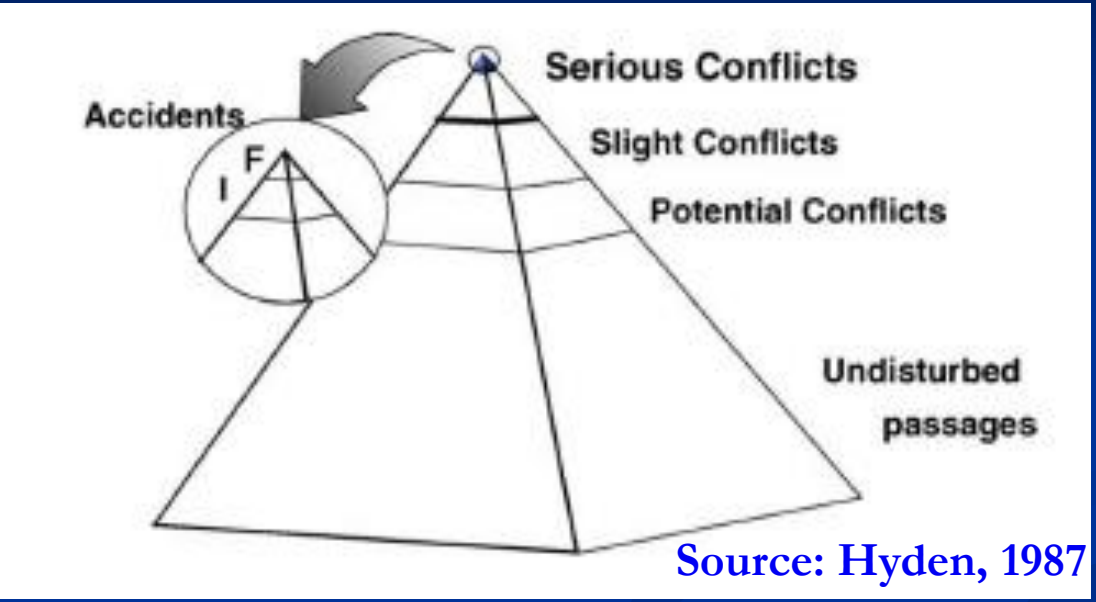
Automated Safety Analysis -Motivation

- Traditional road safety analysis (assessment of black-spots and safety countermeasures) is a reactive approach, based on historical collision data
  - There are well-recognized availability and quality problems associated with collision data
  - Long observation periods (2-3 years)
  - Less complete understanding of the complex interaction of crash causing factors and how safety measures work
- A more proactive approach is needed that provides a better understanding (more quickly) of safety problems & road safety improvements

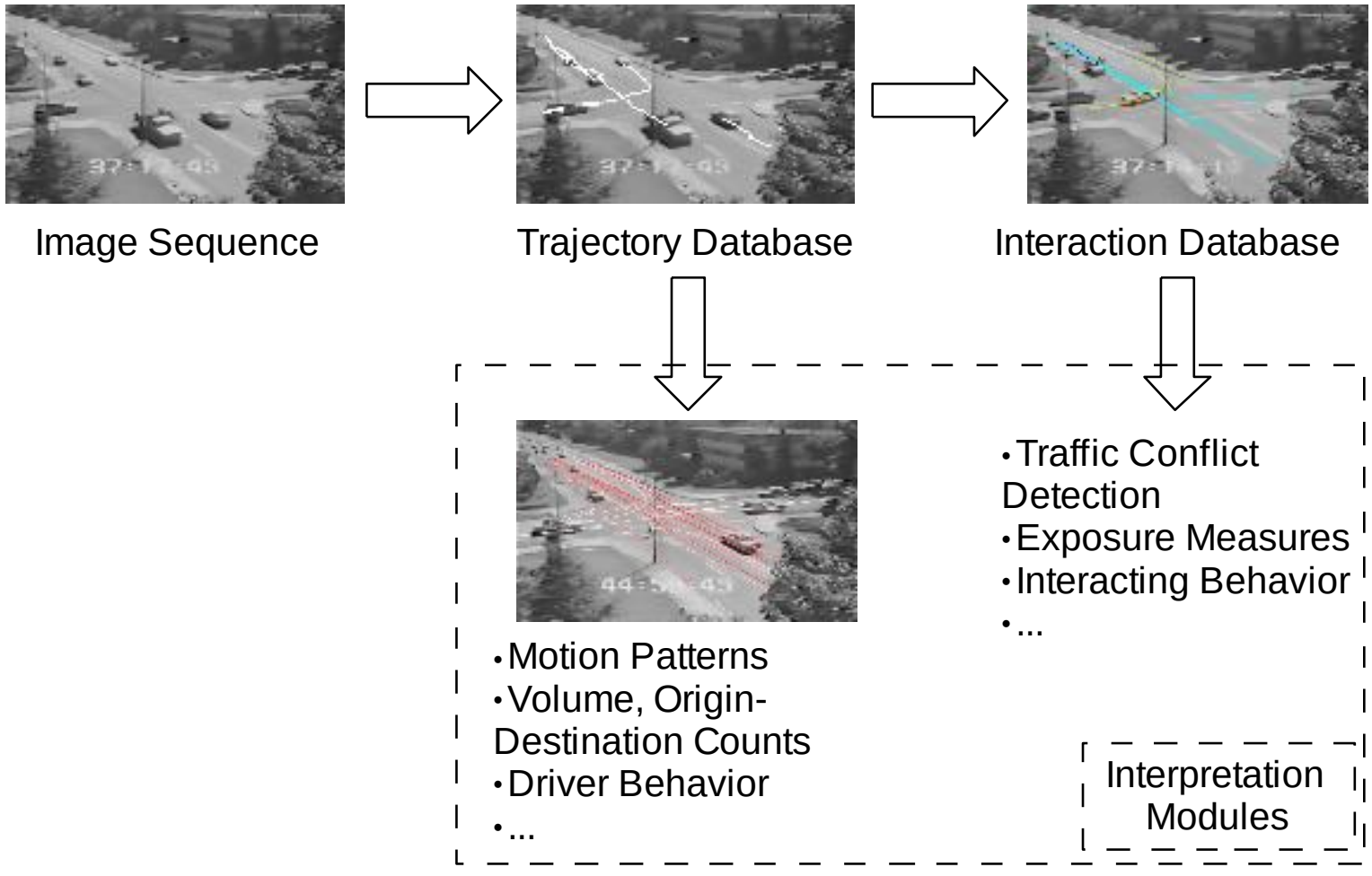
Traffic Conflicts (near-misses)



Source: Hyden, 1987

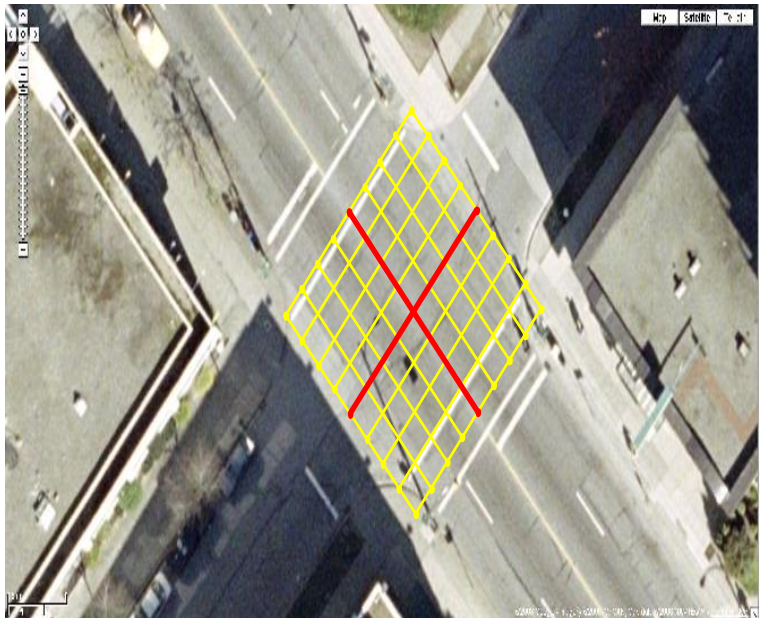
- Shortcomings
  - Cost of data collection
  - Issues related to the reliability and accuracy of human observers
- Automation can enable the traffic conflict analysis in an accurate, objective, and cost-efficient way

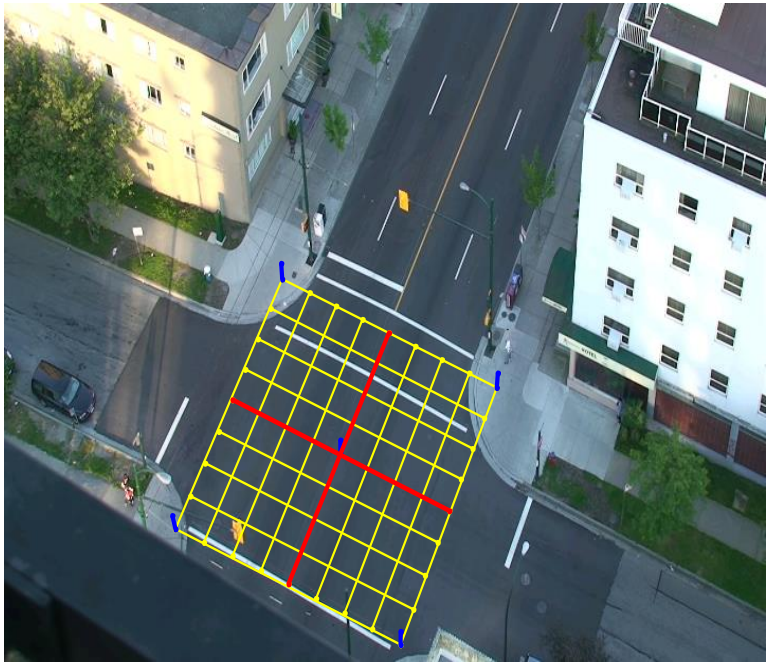
A Modular System for Vision-based Automated Road Safety Analysis



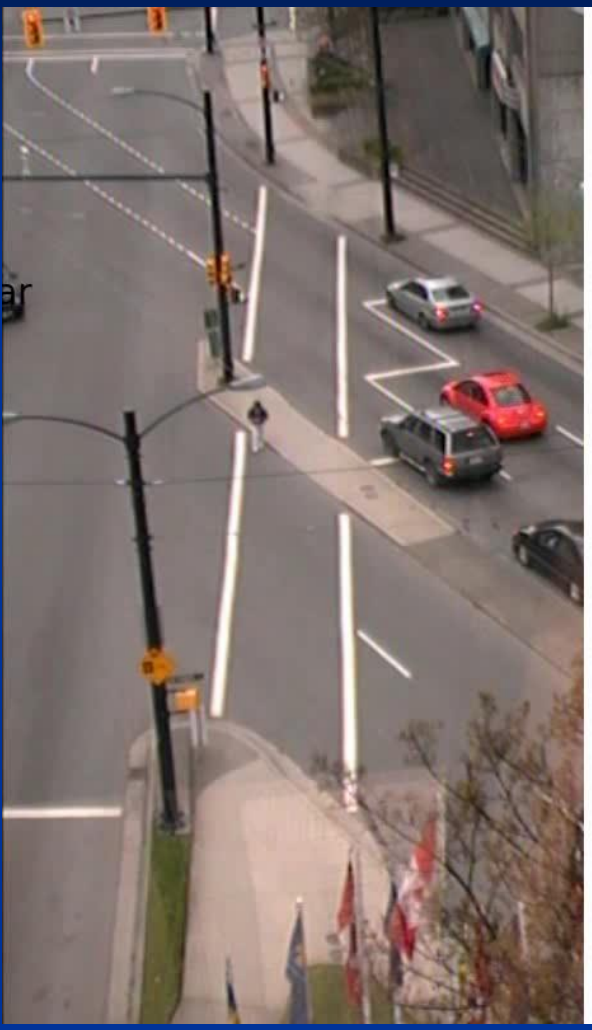
Real-world Coordinates Recovery

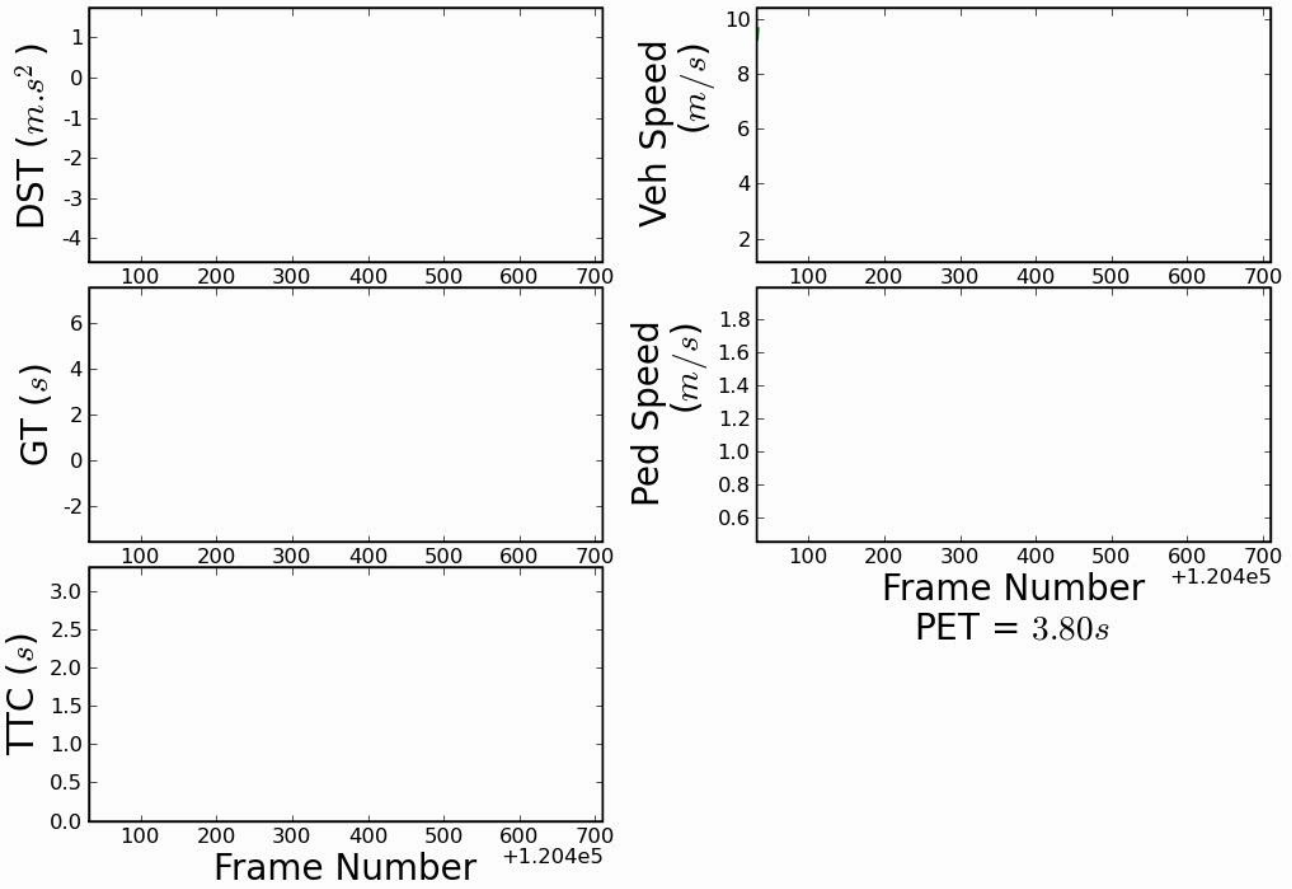
Camera Calibration



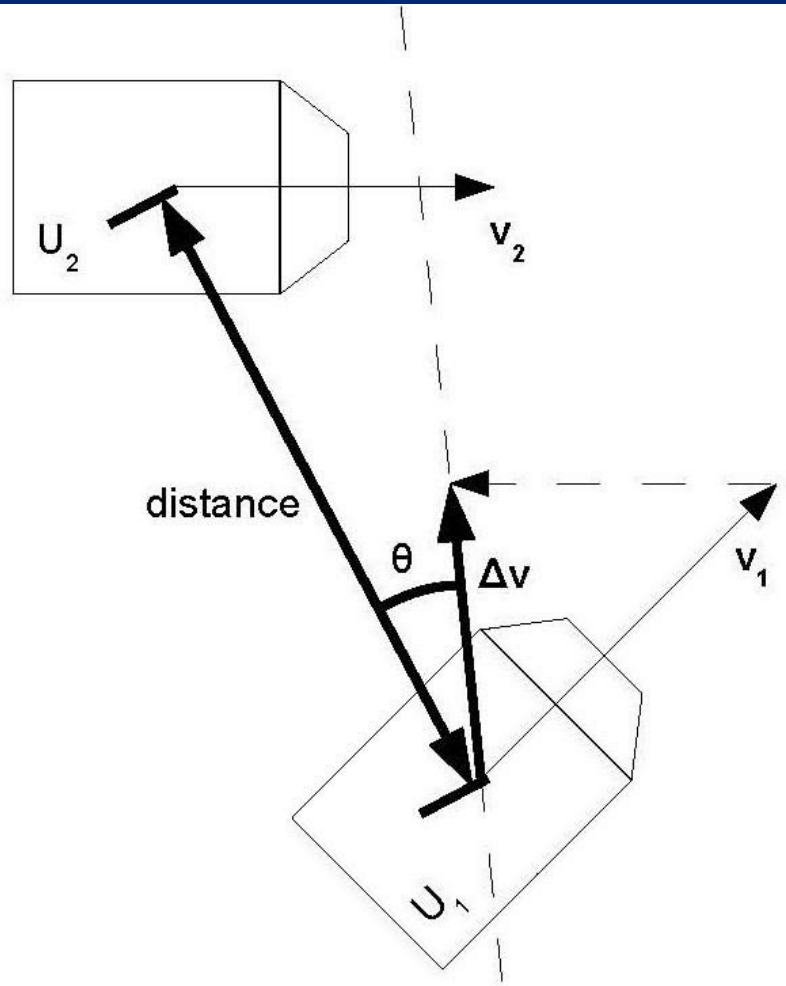


Automated Conflict Analysis





Collision Type Probabilities



Example

Benefits and Applications

- Applications
  - Assessing new and innovative safety countermeasures
  - Assessing the safety problems of current black-spots/high risk locations
    - to supplement or replace crash data
    - To provide more detail on driver behaviour
- Benefits
  - Assessments can be done quickly
  - Removes bias of human observers
  - Lot more data on safety issues

Automated Safety Analysis - Conclusion

- A **new** approach to road safety analysis
  - Proactive, generic and low cost approach
  - Collection of microscopic exposure and behavior data
  - Provides better understanding of driver behavior especially collision avoidance mechanisms
  - Diagnostic approach
  - Overcomes the problems with the traffic conflict technique (high cost and reliability of observers)
- **It is time to take safety analysis in a new direction**

Thank You