Drive Video Analysis for the Detection of Traffic Near-Miss Incidents

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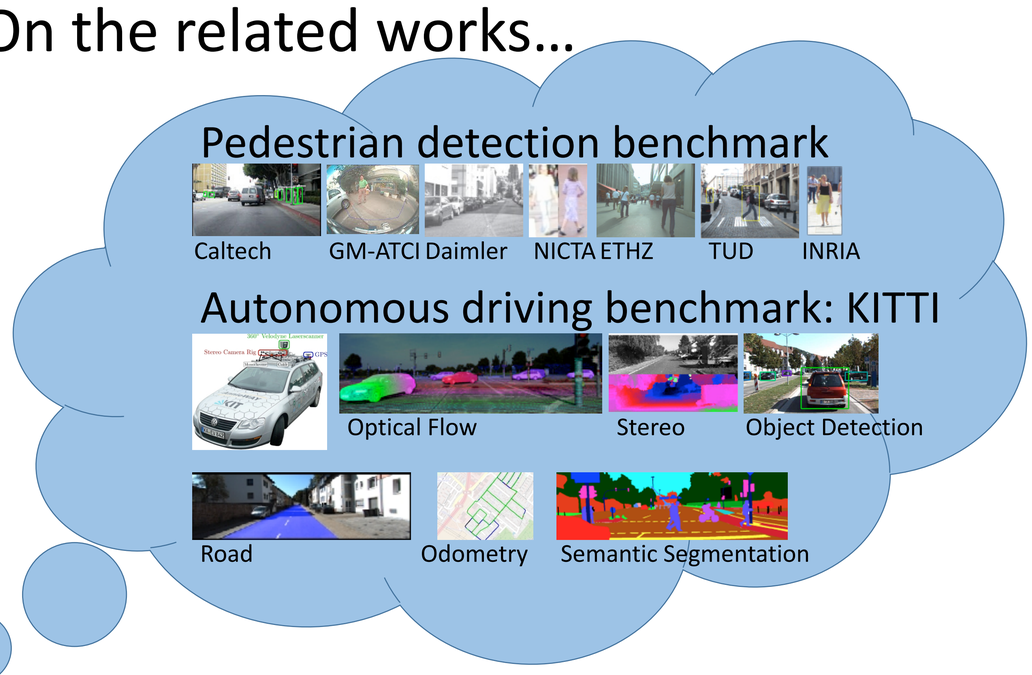
Contribution 1

We have collected and annotated a novel DB that contains TRAFFIC NEAR-MISS INCIDENT scenes

On the related works…



Our Philosophy

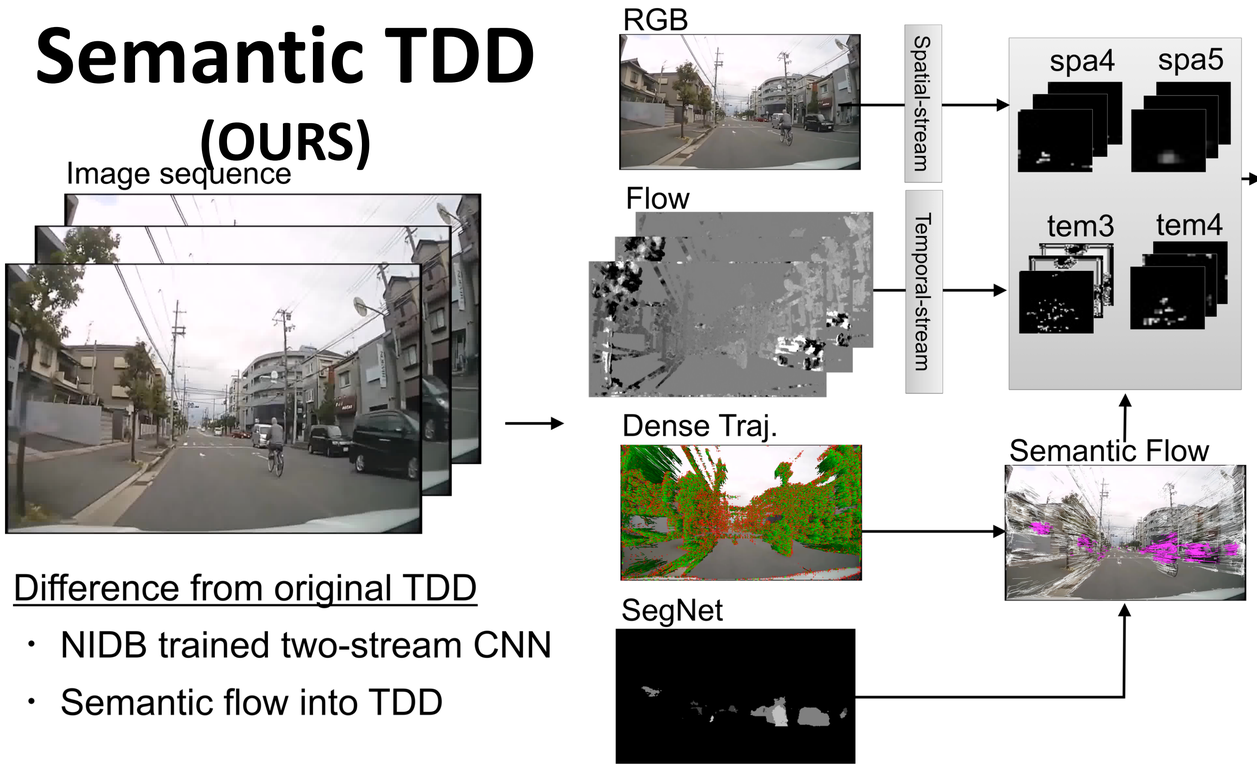
"making sure that analysis of traffic near-miss incidents helps prevent collisions"

【Annotation】 Risk: {High, Low} Attribute: {Ped., Veh., Cycl.}, and bg

Contribution 2

Benchmarking on the NIDB

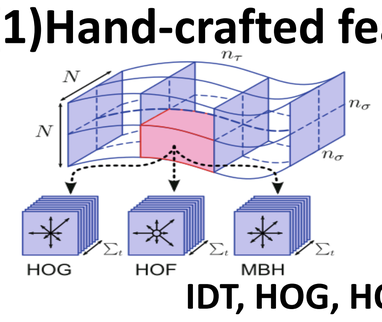
Semantic TDD (OURS)



Difference from original TDD

- NIDB trained two-stream CNN
- Semantic flow into TDD

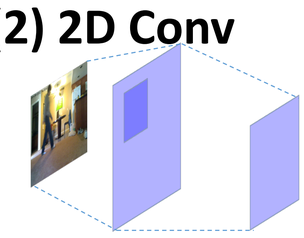
(1)Hand-crafted feat.



IDT, HOG, HOF, MBH

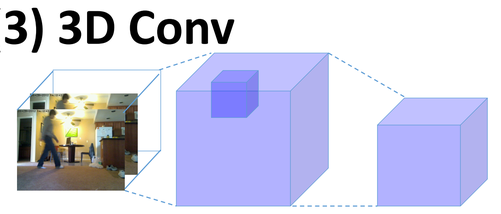
VS.

(2) 2D Conv



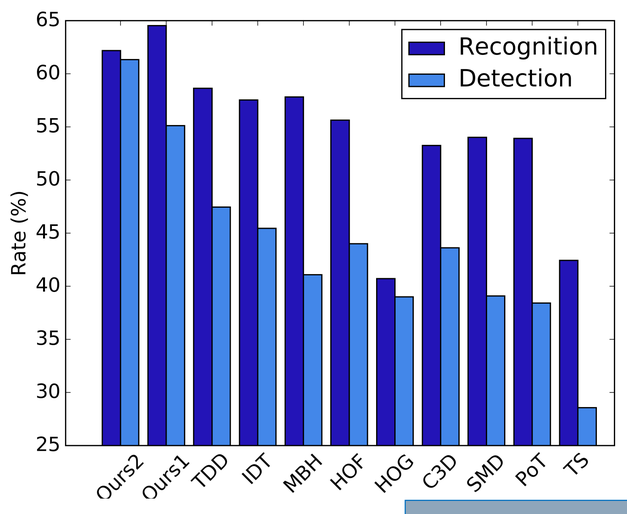
SMD, PoT, TS

(3) 3D Conv



C3D

				Ours0	Ours1	Ours2
Spatial TDD	✓	✓	✓	✓	✓	✓
Temporal TDD		✓	✓	✓	✓	✓
Background fine-tuning			✓	✓	✓	✓
Near-miss fine-tuning				✓	✓	✓
Foreground & background					✓	✓
Extra IDT features						✓
Recognition task	56.3	58.6	60.0	63.2	**64.5**	62.1
Temporal Detection task	46.1	47.4	48.0	49.9	55.1	**61.3**



Best on Rec.: Ours1
(TDD+SemFlow+Finetune)

Best on Det.: Ours2
(+IDT feature)

Conclusion & Future Work

- The purpose of the DB is to directly understand near-miss scenes for self-driving and ADAS-equipped vehicles
- We are focusing on "traffic accident anticipation" in our on-going work which is annotating additional labels and adaptive loss