

Auto-confrontation

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Research question

Better understanding of ND risky situations

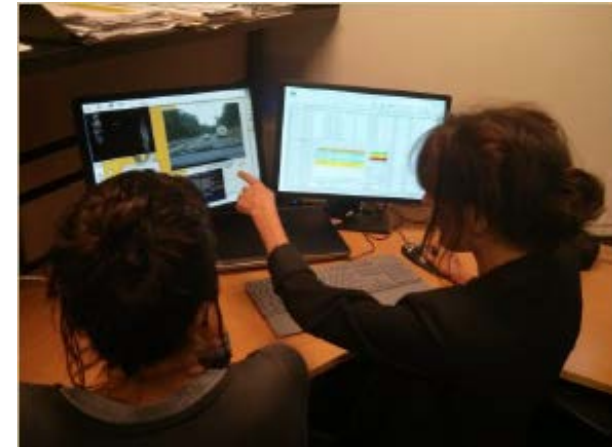
- Genesis of the situation
- How driver managed / perceived risk

Enhance driver behavior knowledge for road safety

- What behavior explains keeping control in dangerous situations?
- Are secondary tasks linked with critical situations?

Autoconfrontation method

- Interview using Multi sense, dynamic data
- Subjective data on driver experience
 - Gives driver point of view of specific behavior to avoid misinterpretation
 - Gives affective value of the situation



Threat
<ul style="list-style-type: none">• Reconstructed memories• Social desirability

Precautions
<ul style="list-style-type: none">• Recent data• Striking event• Specific event• Naturalistic videos of events



Event detection

- Why : no anticipation => Hard braking
- How to detect
 - Mean of acceleration on 0.5 s
 - Select brake under 5m/s^2 during at least 0.3 s and brake under 3m/s^2 during at least 0.5 s
 - Create segment attributes on the segments: TIV, Speed limits, TTC, distance to lead vehicle, mean brake, min brake ...
- Annotate events and identify false and good detection
 - Identify false alarms (before round about, due to speed limit decrease)
 - Identify good detection : small TIV, ABS activation
- Create automatic rules to label the events
 - Used actually: small TIV, ABS, arrival to round About, Speed limit variation
 - To be investigated: arrival to intersection with stop sign or traffic lights, road type
- Select situations to be presented to the drivers

First results on event detection

- Number of trip : All OS 57634, France 19630 (6/3/0217)
- Brake under 5m/s^2 during at least 0.3 s
 - All OS 875 events
 - Brakes removed by rules : 177
 - Brakes confirmed by rules : ABS 24, TIV<1s 32
 - To characterize with new rules : 674
 - French OS : 374 events
 - Brakes removed by rules : 73
 - Brakes confirmed by rules : ABS 10, TIV<1s 10
 - To characterize with new rules : 291
- Brake under 3m/s^2 during at least 0.5 s
 - All OS : 51631 events
 - Brakes removed by rules : 12291
 - Brakes confirmed by rules : ABS 204 TIV<1s 1308
 - To characterize with new rules : 38906
 - French OS : 21877 events
 - Brakes removed by rules : 5799
 - Brakes confirmed by rules : ABS 67, TIV<1s 486
 - To characterize with new rules : 15917

Protocol

- Driver debriefing on 5 “recent” events (hard braking / secondary task)
 - What were you doing?
 - What tipped the situation to being a critical one?
 - How did you react?
- Any other experienced critical situations
 - What happened?
 - What was your situation awareness?
- Interviews (1h30 each) by a psychologist, at IFSTTAR (Lyon, France) end of March 2017

Expected results

- Validation and better definition of thresholds for critical event detection
- What tips the situation to critical
- Secondary task impact on driving
- How drivers avoided accident, why nothing finally happened