



PSA PEUGEOT CITROËN

# Data Mining for driver behavior in normal driving

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# Accidentology, Biomechanics, Driver behavior

- Common research laboratory between French car manufacturers



- Missions

- Road safety and cars safety
- Safer and supporting cars
- Real performance of safety devices and ADAS

# Innovative applications and Information Systems in line with complex business challenges



## Architecture & Technology

- Architecture design
- Technical Assessment
- Expertise: Big Data, Data science, Web, Cloud, NoSQL, BI, IAM, UeX
- Choice of technologies



## Information Systems Management

- IT master plan
- IS Assessment
- Application Portfolio Management
- IT Governance



## Change management

- Agile methodology, Team dynamics improvement
- Lean IT
- Software factory
- Software quality, testing strategy
- Training & conference



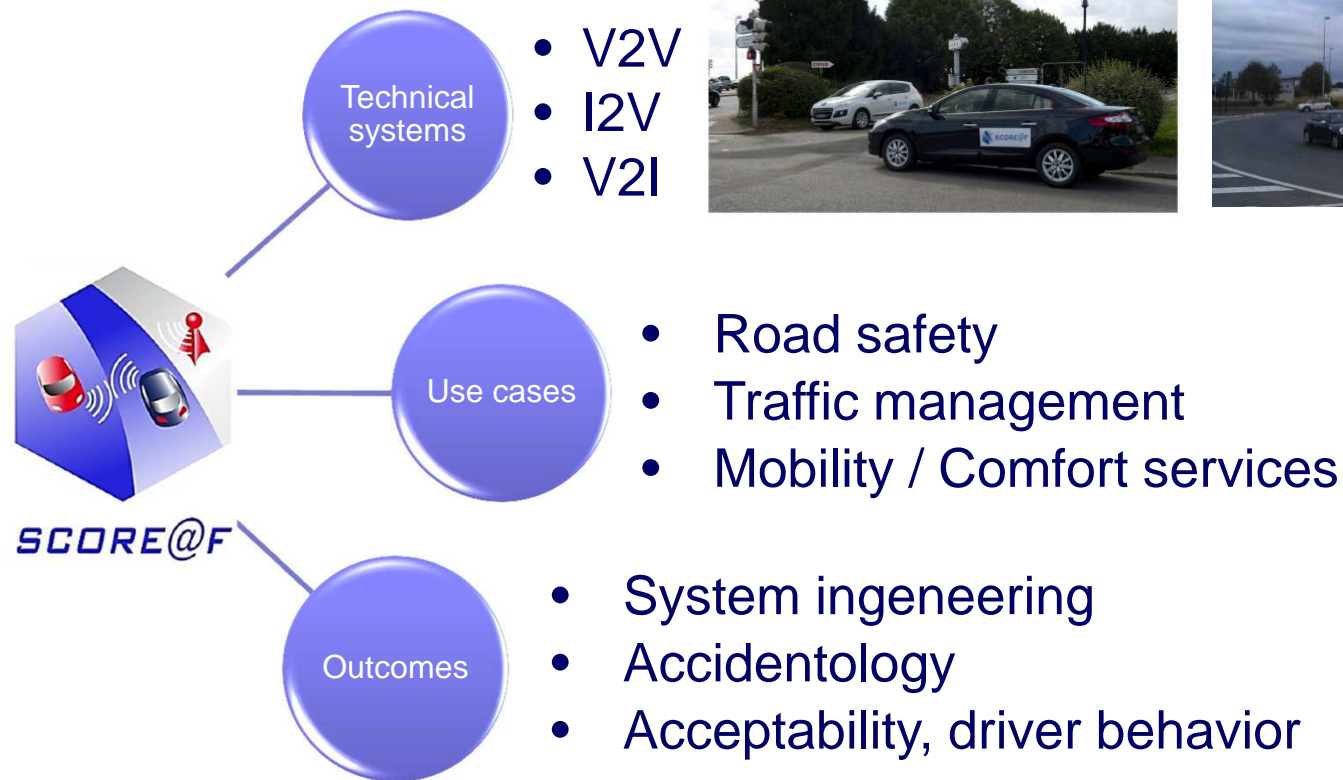
## Design of innovative applications

- 360° project scoping
- Lean startup
- Agile development

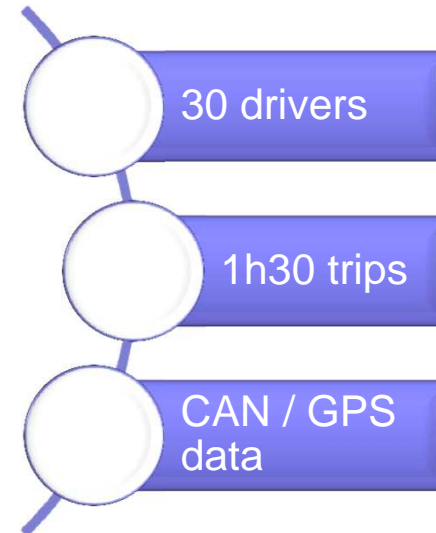
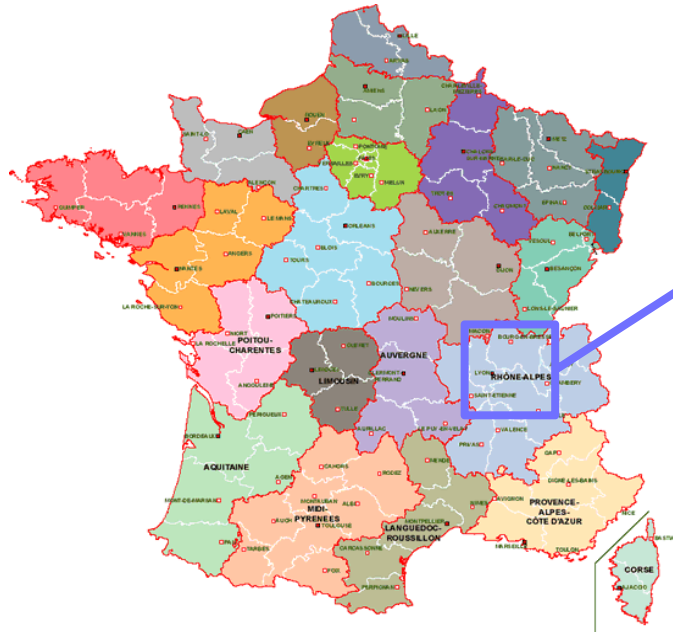
# SCORE@F



- French FOT
- Part of Drive C2X European project
- IT Systems potential



# FOT 38



## Information / alert messages on Ipad



Road safety



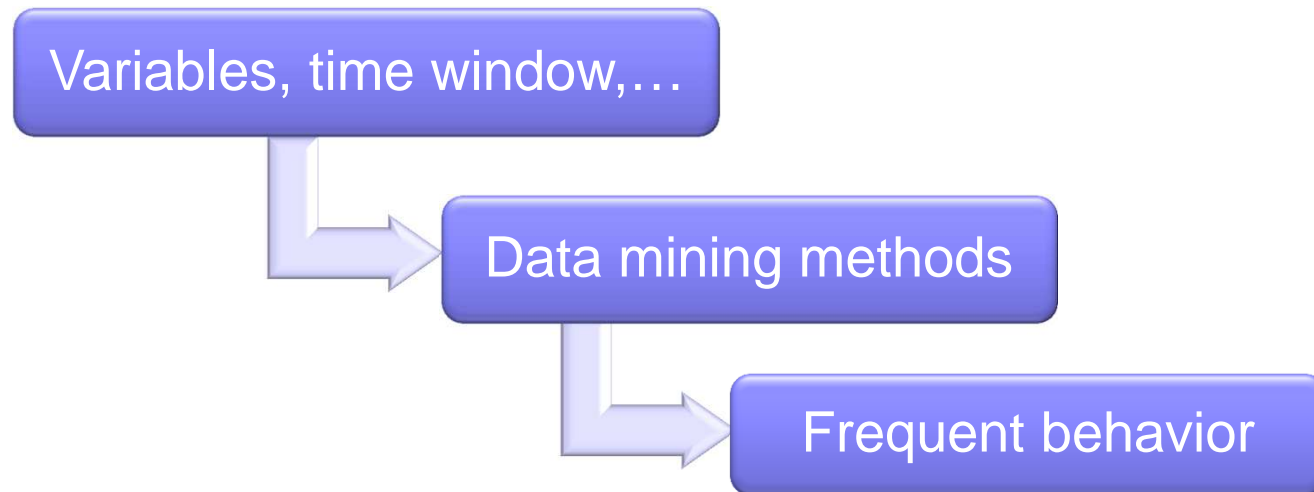
Point Of Interest



Traffic management

# Drivers reactions to on-board message?

## ■ Methodology



## ■ Use case

- Speed limit message



- Sequence analysis in 



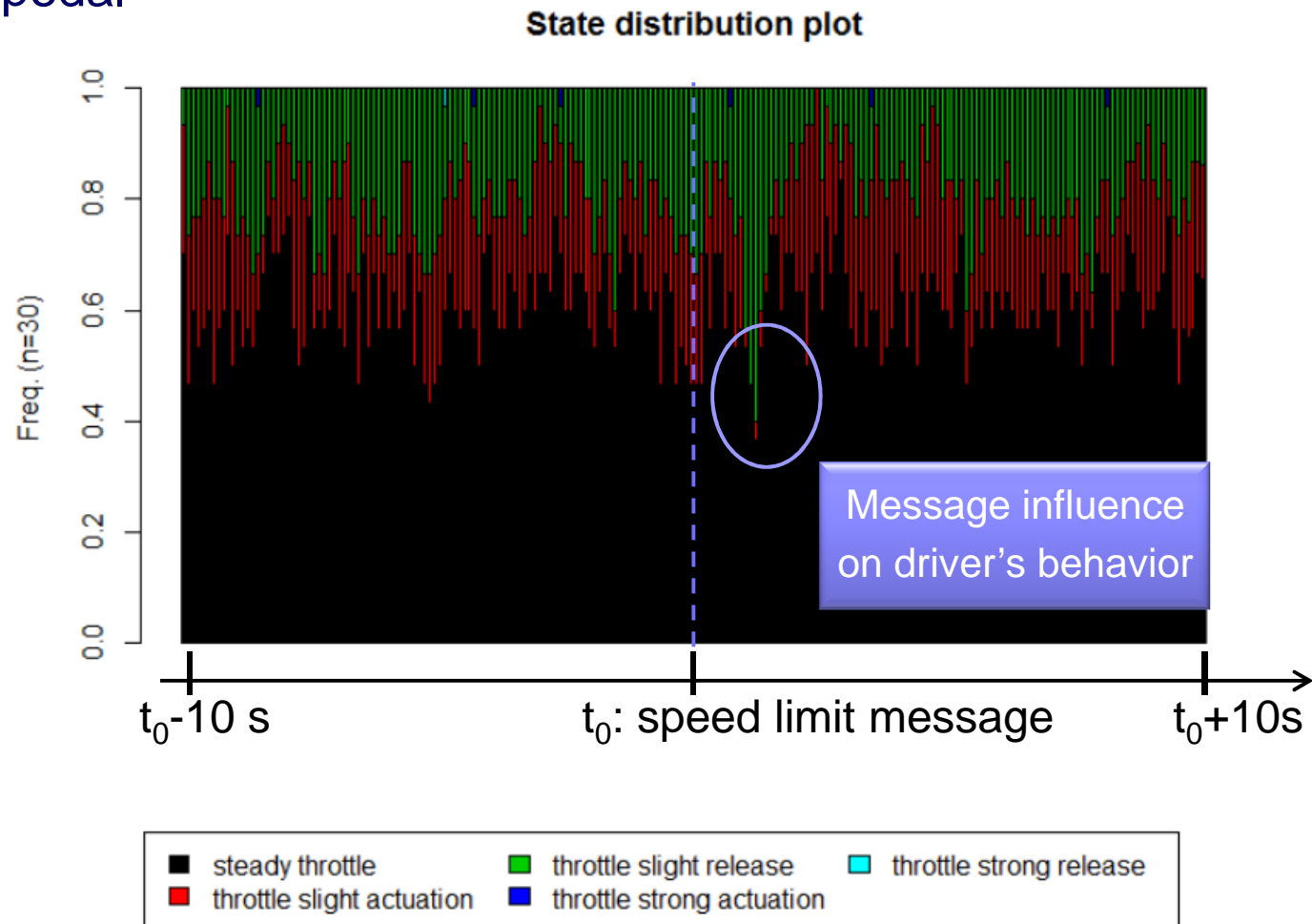
# Data example: speed





# States distribution visualisation

- Throttle pedal

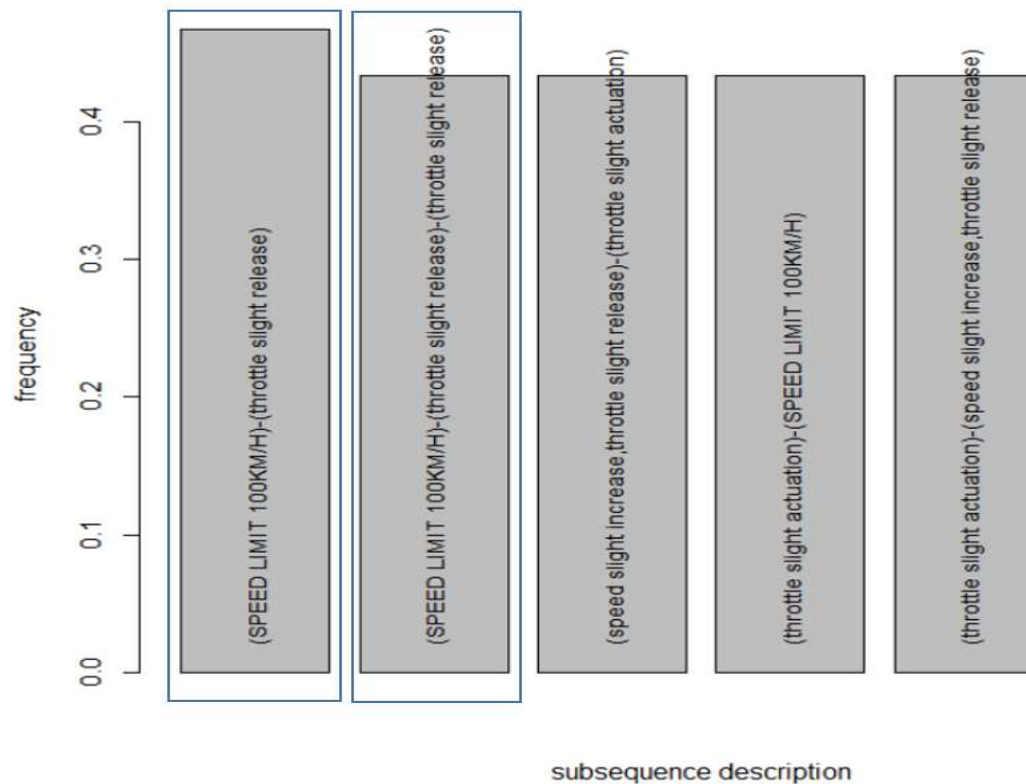




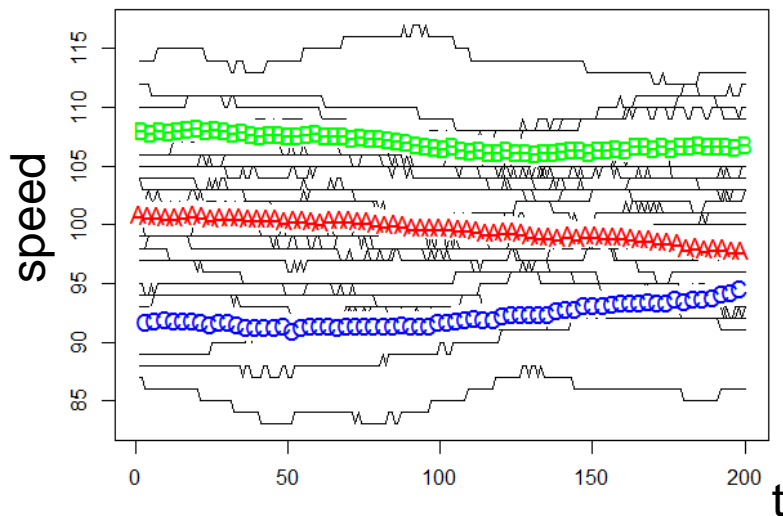
# Sequential pattern mining results

## ■ Behavior patterns

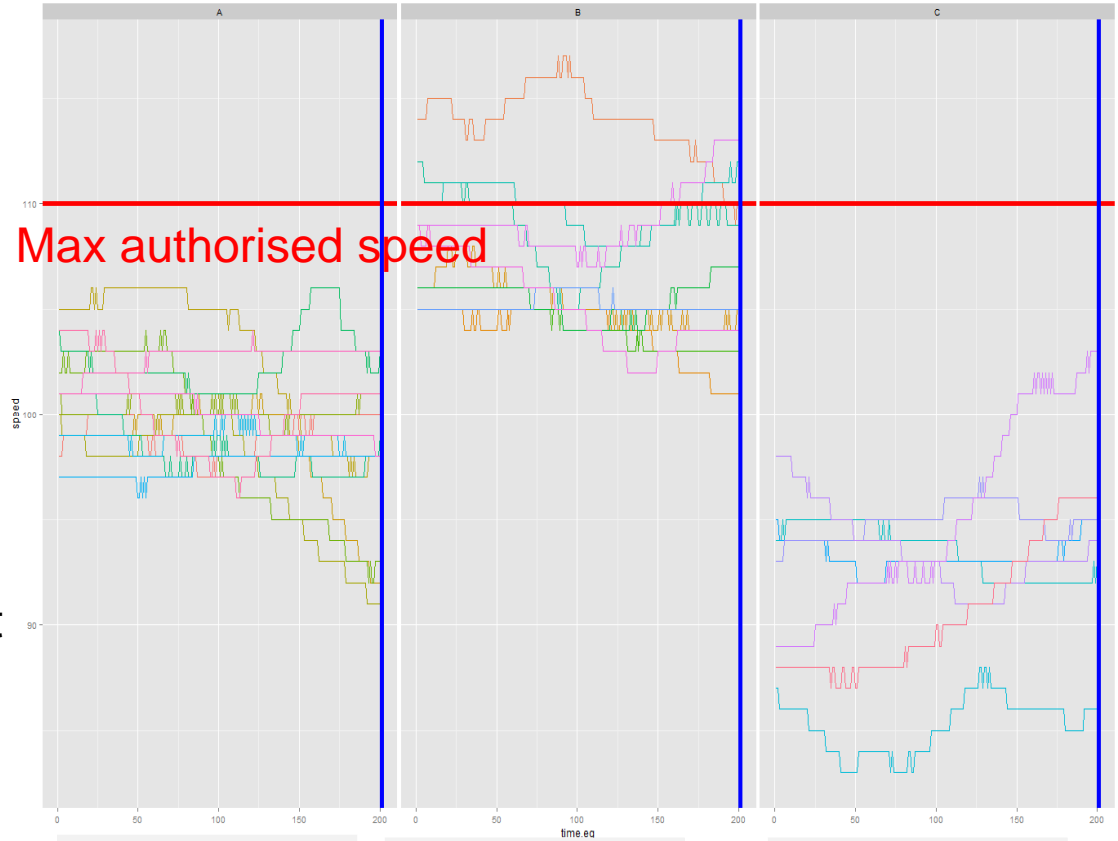
- One or more throttle pedal release after message
- Slight throttle release (47%)



# Discriminant analysis



Speed profiles for the 3 groups around message time

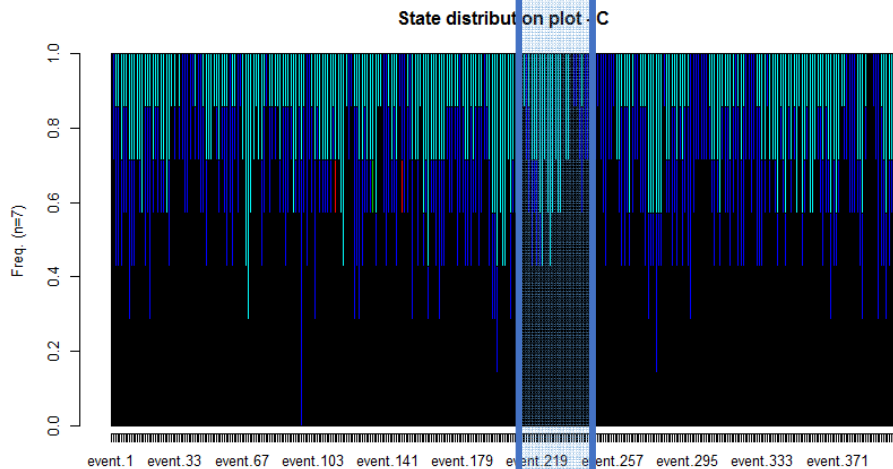
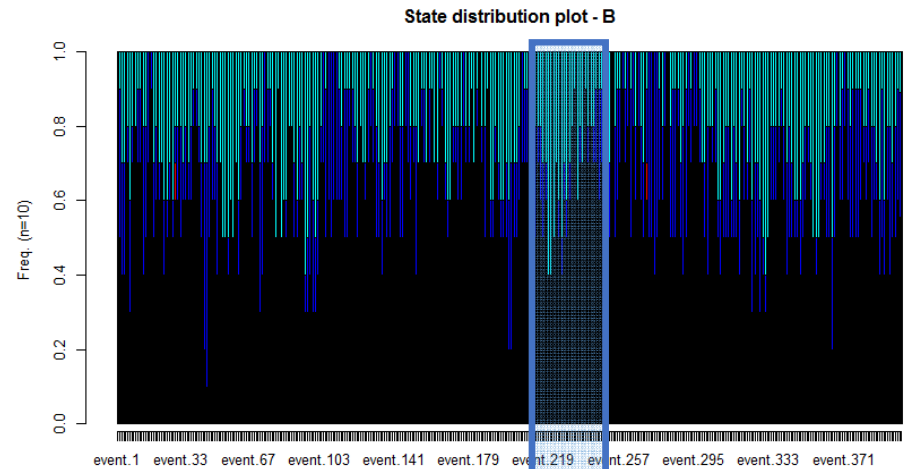
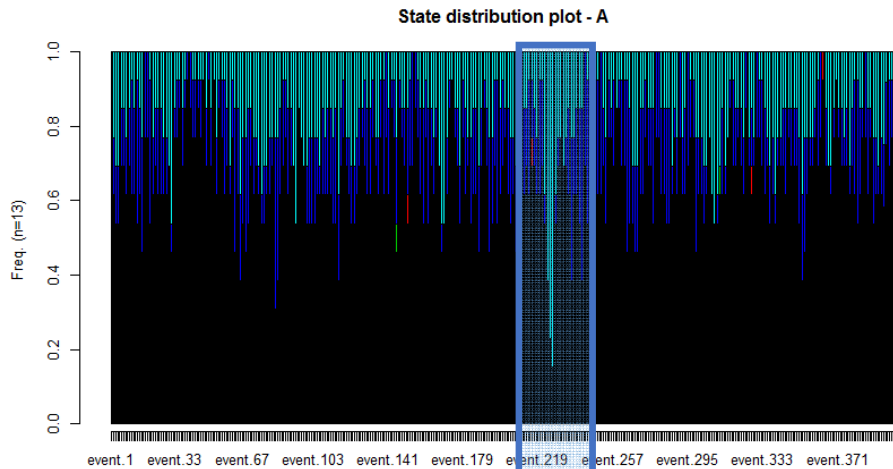


Group A speed profile

Group B speed profile

Group C speed profile

# State sequences for 3 groups



- Continuous accel
- throttle slight press
- throttle slight release

Throttle slight release significantly more frequent for A group

# Conclusion

- Sequential pattern mining to evidence frequent behavior
- Clustering method to evidence behavioral subgroups
- Innovative techniques
  - New use case for data mining methods
  - Complementary method for NDS



# Perspectives: project applications

## ■ U-Drive

- European naturalistic driving project
- Focus on ADAS use and distraction
- 120 cars in 4 European countries



## ■ SCOOP@F

- Large scale deployment of ITS in France  
3000 cars  
All types of roads (urban / rural / highway)
- Set up for a new French FOT  
SCOREF use case + other mobility services  
Benefit evaluation  
Distraction linked to Intelligent Telecommunication Systems



