Cross-Car, Multiplayer Games for Semi-Autonomous Driving

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Welcome inside a car of the future!
Short periods of autonomous driving  Full window HUDs  Vehicle-to-vehicle communication  Motion tracking
Contributions

**Cross-car** games as design artifacts

Characterization of design space for in-car games
Go out in the world to play

Bring video games into real life

Meet with people in the real world
Cross-Car Games

Multiplayer games across cars sharing the road
Prototyping system
Billiards
Design Considerations

Occlusion: Alternative visualizations
Design Considerations

Comfort and safety
Evaluation of the Games

12 participants

Primarily qualitative

Each player played all 3 games
Results

Co-located play was enjoyable and players were highly immersed (Player Experience Inventory)
Contributions

Cross-car games as design artifacts

Characterization of design space for in-car games
Design Space for In-Car Games

(See paper for more details)
Cross-Car Games

- **Multiplayer**
  - Within car
  - Between cars

- **Co-Located Cars**
  - Active
  - Passive

- **Presentation**
  - Phone/PDA
  - Tablet
  - HUD
  - In-car display
  - Sound
  - AR
  - VR

**Is Game**
- Multiplayer: Within car, Between cars
- Competition Style: Competitive, Cooperative
- Co-Located Cars: Active, Passive
- Environment: Car, Location, Conditions

**Input**
- Phone/PDA
- Tablet
- Game Controller
- Prop
- Camera
- Motion Tracking
- In-car controls

**Driver Plays**
- Always
- Sometimes

**Route Influence**
- Destination
- Path

**Genre**
Gaps in the Design Space

Games leveraging different traffic environments

Team-based and competitive in-car games

Games influencing the driving route

Cross-car games
Future Work

How to integrate story-filled adventure games into the car environment?

What kind of interface will people choose to join or leave games?
Cross-car games as design artifacts

Characterization of design space for in-car games

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Bonus Slides
Killerball

1 HIT

2 BLOCK
Killerball
Decoration

1. DECORATE

2. RATE
Decoration
Takeover task