Gamifying the Commute: from concepts to games

Dr. Rod McCall

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About UL, SnT and Our Team

• University of Luxembourg
  • SnT, Interdisciplinary Centre
  • Around 230 staff (incl PhD students)

• IGNITE (Interaction, Games and Novel Interface Technologies) part of SECAN-Lab
Structure and themes for this presentation
I-GEAR: The Project and the Context
I-GEAR Project Overview

Incentives and Gaming Environments for Automobile Routing

Duration: 2012-2015 (submitted early 2011)
Funded by Fonds National de la Recherche, Luxembourg
Underlying Concepts

• We should solve the cause not tinker with the symptoms
• Viewing commuting as a game or game-like world
• About suggesting alternative activities
• Introducing IVIS systems into a car raises usability and safety concerns
• Cannot get back time!
Context – Luxembourg

- Population: 537k approx (City: 103k)
- High GDP
- 176k cross-border commuters per day (majority to Luxembourg City)
- Very high car ownership rate
- Relatively poor public transport outside of the city
- Very reliant on Greater Region countries
- Congested European City
- Low fuel prices

Sources: Daily Cross border commutes to Luxembourg (Decoville & Sohn 2012)
STATEC (Luxembourg, 2013)
The Problem and the Philsophy

- Average time spent in traffic jams
  - Luxembourg (Country) 29 hours per year
    - Approx 1 day / 3.5 work days
  - Belgium 58 hours per year
    - Approx 2 days / 7 work days

- 1% of EU GDP lost in traffic
- Pollution, stress, accidents
- People have reasons for taking the car!

Relatively small behaviour changes = Major Benefits

Average time data from Inrix Traffic Scorecard, 2013
Context – Luxembourg Traffic Flow

Heat Map Luxembourg

Sample travel trajectory in Luxembourg City

Kracheel et al.
User Interfaces and Driver Safety
User Interface Issues and Challenges

- Safety
- User Acceptance
- Cultural differences
- Cognitive Load
- Interface styles, game dynamics
- Testing approaches
- Task and context
- Auditory/Visual issues
Visual Manual Distraction Study

Two of the interfaces used in the study

- Study undertaken to assess impact of different user interface styles on driving performance and interaction under a simulated car following task environment.

Louveton & McCall et al. (under submission).
Real and Simulated Track Studies

- Study undertaken to assess variation in driving behavior due to different user interfaces on a mobile device under track and simulated conditions
- Interaction, BCI and car data recorded
- Car following task

Pilot study. More detailed analysis to be undertaken and further studies conducted!

Sengupta MSc Thesis. Supervisors: McCall, Louveton and Engel

Mindcap XL Lowcost BCI
The City, Games and Play
The City and The Commute

View the the city and the commute as a place to play!

From Lynch, Alexander, to Ching, Gustavson and beyond
Games and Game-Like Environments

- **Gamification** (Deterding et al)
- **Games with a purpose** (Ahn et al)
- **Persuasive Games** (Bogost)
- **Pervasive Games** (Montola et al)
- **Serious Games**

- And of course just games!
Games

Completion
Focus
Challenge
Player Skill
Social

Based on Sweetser & Wyeth 2010
Methodology for Capturing Activities and Designing the System
What interests us: Activity Chains

What degrees of possible intervention?
Contextual Design Approach

Understand the potential users within the relevant context

- Problem Analysis
- Contextual Interviews
- Interpret and Model Data
- Consolidation
- Visioning
- Storyboarding
- UI Design and prototyping

Adapted from Holtzblatt (2004)
Our Approach

Metaphorical - “Coffee Games”

- Online Questionnaire
- Mobile Application
- Travel Diary
- Focus Groups
- Storyboarding
- UI Design And prototyping
- Observation
Metaphorical Games

Get Coffee at Different Time

Get Coffee for Someone else

Get Coffee at Different Place

McCall and Kracheel et al (2013)
Summary Results Coffee Games

- Social status issues of doing something for others
- Different classes of rules of play behaviour
- Competition important but not for all
- 50% changed behaviour
- Different degrees and types of participation should be supported

McCall and Kracheel et al (2013)
Driver Diaries Screenshot and User Tests

Pre-Online Demographic questionnaire, mobile application then focus groups To/from work and lunchtime.

The study examined commuter activity patterns.

Kracheel, McCall and Koenig et al.
Don’t Forget Data Privacy!

Early work indicated that gamification has an effect on our willingness to disclose data!
Activity patterns to form basis of future games.
“LeaveNow Game”

- Relative change in leaving time from home and office
- Leaving time has been extensively tested
- Three different controlled test conditions
The Future Commuting Experience
Conclusions and Summary

• Consider the activity patterns of commuters and focus on those elements for behavior change
• The interface style has an effect on interaction and driver performance/safety
• Gamification impacts level of participation and also willingness to disclose private data

*In future will the car or I decide?*
For more information including the results, papers and references used in this presentation please contact:

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Thanks for coming and my thanks to all those involved in the I-GEAR project

Reference: Rod McCall, “Gamifying the Commute” seminar given at Stanford University and UCLA, November 2014.