Gaming Concepts and Incentives to Change Driver Behaviour

Rod McCall & Vincent Koenig

Interdisciplinary Centre for Security, Reliability and Trust
I-GEAR

• Incentives and Gaming Environments for Automobile Routing

• I-GEAR

  • Thomas Engel, Rod McCall, Vincent Koenig, Romain Martin, Bob Reuter, Martin Kracheel, Tigran Avanesov
Traffic Jams... let's think a little differently

Why Bother?
A Little Change…

- How fixed are your times or routes for driving?
- Changing transport modality sometimes
- Selecting another mall or car park
Aspects of Gaming

Clear Goals
Challenge & Player Skill
Social Aspects
Feedback
Concentration?
Immersion?
Allow completion?

Based on K. Jeggers (2007) and Csíkszentmihályi (1992)

Image from IOGC.net
Flow Theory and the Magic Circle

- Csíkszentmihályi
  - total absorption in an experience (flow)
- Montola
  - What constitutes “a pervasive gaming experience”? The magic circle and pervasive games

Pervasive to Persuasive
Where did you drive today?
And why?
Approach: Contextual Enquiry

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<th>Requirements</th>
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<td>Problem Analysis</td>
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<td>Contextual Interviews</td>
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<td>UI Design and Prototyping</td>
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Based on the work of Beyer & Holtzblatt 1998
Holtzblatt (2004)
### I-GEAR: Sample Concept

<table>
<thead>
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<th>Team</th>
<th>Played</th>
<th>For</th>
<th>Against</th>
<th>Won</th>
<th>Draw</th>
<th>Lost</th>
<th>Total</th>
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<tbody>
<tr>
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<td>75</td>
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<td>2</td>
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</tr>
</tbody>
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Human-Factors Issues: Safety

From safety through comfort and efficiency

Layer 1
- Safety only focus

Layer 2
- Safety
- + additional tasks

Layer n
- Safety
- + additional tasks from layers 2 -> n-1
- + additional tasks from this layer
Human-Factors Issues: Usability

- Learnability (thresholds)
- Errors (frequency/severity)
- Task completion time
- Subjective satisfaction

- Inattention to primary task (Eye tracking data)
- Lane deviation
- Response time
Desktop Driving Simulator

- **System**
  - Eye-tracking (simulator and in-car)
  - Multi-user collaborative environment
  - Customisable open-source platform based on gaming engine
  - Ability to add hardware e.g. tablet PCs or novel interface devices

- **Simulation**
  - Model of central Luxembourg City
  - « Real World » traffic simulation
Not being implemented
Conclusions

• I-GEAR aims to see congestion as something “almost” beneficial
• From design issues through to human-factors concern
• Early identification of possible business cases
• Makes driving fun and beneficial! (for all!)
Thanks

• For more info look up I-GEAR at:
  – www.securityandtrust.lu

  – Blog: www.rodmc.com

  – Twitter: rodlux