Idee:

* Car Diagnostic Reader, ODBII, WLAN ( ca. 20$):

1. Engine RPM
2. Vehicle Speed
3. Short Term Fuel Trim/Long Term Fuel Trim

* Mögliche Wetten bezogen auf die drei Punkte oben:
  + Wetten, dass Drehzahl unter einem gewissen Wert bleit und pro Zeitwert/km-Wert nicht öfter als x Mal überschritten wird
  + Wetten, dass Geschwindigkeit auf eine Zeit/Strecke von x km nicht öfters als y Mal überschritten wird
  + Wetten, dass auf eine Strecke ein Verbrauch von x l/km nicht überschritten wird

Experience Story:

Dani und Alex sind Arbeitskollegen und haben seit längerem eine Fahrgemeinschaft. Alles funktioniert wunderbar, nur dass sich Dani immer fürchterlich über Alex’s Fahrverhalten aufregen muss. Ständig fährt Alex zu hochtourig, da er das Geräusch des aufheulenden Motors so liebt, ohne dabei an die Umwelt zu denken.

Doch jetzt hat Dani eine Lösung gefunden, um Alex spielerisch mit einer Wette herauszufordern nicht mehr so hochtourig zu fahren. Dani öffnet die neue App „Bet4EcoDrive“ und erstellt folgende Wette: „Hi Alex, wetten du schaffst es nicht so zu fahren, dass du die nächsten 100km nicht öfters als 3 Mal über 3500 Touren kommst!“. Diese sendet sie an Alex.

Alex sitzt gerade beim Frühstück bevor er in die Arbeit fährt, als sein Handy piepst. Erstaunt blickt er auf die Herausforderung von Dani und obwohl er sich etwas über die Wette ärgert, will er Dani beweisen, dass er das spielerisch bewältigen kann. Sofort bestätigt er die Wette und erhöht Dani’s virtuellen Wetteinsatz von 500 Coins um weitere 200.

Auf dem Weg zu Dani, warnt ihn die App bereits zum ersten Mal, dass er das Limit überschritten hat. Alex denkt sich: „Fuck, jetzt muss ich mich wohl echt zusammen reißen!“. Während Dani zur selben Zeit zum ersten Mal schmunzelt muss als sie auf ihr Smartphone schaut: „Das schafft Alex nie, die Wette gewinne ich!“.

Interaction Konzept:

Der Herausforderer entscheidet sich für einen Gegner und generiert über die verfügbaren Vorlagen der App „Bet4EcoDrive“ eine passende Wette. Weiters entscheidet sich der Herausforderer an dieser Stelle, über die Höhe des virtuellen Wetteinsatzes und schickt die Wette ab. Der Gegner erhält die Wette und falls dieser annimmt, kann er den Einsatz noch erhöhen.

Sobald der Gegner in sein Auto einsteigt, verbindet sich die App automatisch mit einer vorinstallierten Schnittstelle im Auto. Somit hat man während der gesamten Wettdauer den Status, ob die Wette eingehalten wird oder nicht. Dieser Status wird allen Beteiligten in Echzeit in der App grafisch in Diagrammform angezeigt.

Ein Dritter kann in die Wette miteinsteigen und für oder gegen die Wette setzen. Der virtuelle Einsatz wird prozentuell zwischen den Gewinnern aufgeteilt.

SOTA:

ACM:

# ****EcoChallenge: a race for efficiency****

<http://dl.acm.org/citation.cfm?id=2037373.2037389&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

Careful use of the limited remaining fossil energy resources is important for both ecological and economical reasons. In addition to technical improvements, fuel consumption of a vehicle is influenced significantly by the driving behavior. Currently, only few in-car user interfaces are trying to promote a more fuel-efficient driving behavior. We propose EcoChallenge, a community- and location-based in-car persuasive game with the goal to motivate and support a behavioral change towards a fuel-saving driving style. We implemented and integrated EcoChallenge in an experimental vehicle and evaluated it in a field study. The results regarding acceleration, deceleration, breaking and coasting show the effectiveness of our approach. In addition, users confirmed a very positive experience with our system.

# ****The car data toolkit: smartphone supported automotive HCI research****

<http://dl.acm.org/citation.cfm?id=2516540.2516550&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

Automobiles are environments rich of data that have a high potential to be used as input for research and design. Various difficulties accessing car data exclude HCI experts from making use of this data in novel interfaces and research projects. We present the CarDaT (Car Data Toolkit) that uses Android smartphones to provide multidimensional sensor data in a minimal invasive way. CarDaT combines smartphone sensor data with data sources like OBD-II as well as other easily available remote data (e.g., weather). This data and the provided connectivity enable researchers to gather data on human behavior and designers to create novel context-aware interface solutions. Thus, CarDaT offers a low-cost, manufacturer independent and scalable in-car agile prototyping and research environment. In this paper we describe how we used smartphones in the CarDaT as tools for automotive research and design. We demonstrate potentials of CarDaT by describing three applications that we developed with the toolkit, namely rear seat games, an experience sampling study, as well as an experiment using car data in a driver distraction study to inform design.

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| |  | | --- | |  | | **Automotive user interfaces: human computer interaction in the car** | |

<http://dl.acm.org/citation.cfm?id=1753846.1753949&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

Cars have become complex interactive systems. Mechanical controls and electrical systems are transformed to the digital realm. It is common that drivers operate a vehicle and, at the same time, interact with a variety of devices and applications. Texting while driving, looking up an address for the navigation system, and taking a phone call are just some common examples that add value for the driver, but also increase the risk of driving. Novel interaction technologies create many opportunities for designing useful and attractive in-car user interfaces. With technologies that assist the user in driving, such as assistive cruise control and lane keeping, the user interface is essential to the way people perceive the driving experience. New means for user interface development and interaction design are required as the number of factors influencing the design space for automotive user interfaces is increasing. In comparison to other domains, a trial and error approach while the product is already in the market is not acceptable as the cost of failure may be fatal. User interface design in the automotive domain is relevant across many areas ranging from primary driving control, to assisted functions, to navigation, information services, entertainment and games.

# ****Automotive user interfaces and interactive applications in the car****

<http://dl.acm.org/citation.cfm?id=2485760.2485768&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

In-vehicle electronic devices are becoming ubiquitous. Drivers and passengers use these devices because they perceive them as providing valuable services. Some of these devices, such as collision warning systems, assist drivers in performing the primary task in a vehicle that is driving; others provide information on myriad subjects or entertain the driver and passengers. A problem that arises from the proliferation of in-vehicle devices is that they might distract drivers from the primary task of driving, with possibly disastrous results.

# ****In-car game design for children: child vs. parent perspective****

<http://dl.acm.org/citation.cfm?id=1753846.1753949&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

Family car rides can become a source of boredom for child passengers, and consequently cause tension inside the car. In an attempt to overcome this problem, we developed Mileys -- a novel in-car game that integrates location-based information, augmented reality and virtual characters. It is aimed to make car rides more interesting for child passengers, strengthen the bond between family members, encourage safe and ecological driving, and connect children with their environment instead of their entertainment devices. We evaluated Mileys with a six-week long field study, which revealed differences between children and parents regarding their desired in-car experience. Children wish to play enjoyable games, whereas parents view car rides as an opportunity for strengthening the bond between family members and for educating their children. Based on our findings, we identify five key challenges for in-car game design for children: different expectations by parents and children, undesired detachment, short interaction span, poor GPS reception, and motion sickness.

# ****Gameful design in the automotive domain: review, outlook and challenges****

<http://dl.acm.org/citation.cfm?id=2516540.2516575&coll=DL&dl=ACM&CFID=435390463&CFTOKEN=56849188>

In this paper, we review the use of gameful design in the automotive domain. Outside of vehicles the automotive industry is mainly using gameful design for marketing and brand forming. For in-vehicle applications and for applications directly connected to real vehicles, the main usage scenarios of gameful design are navigation, eco-driving and driving safety. The objective of this review is to answer the following questions: (1) What elements of gameful design are currently used in the automotive industry? (2) What other automotive applications could be realized or enhanced by applying gameful design? (3) What are the challenges and limitations of gameful design in this domain especially for in-vehicle applications? The review concludes that the use of gameful design for in-vehicle applications seems to be promising. However, gamified applications related to the serious task of driving require thought-out rules and extensive testing in order to achieve the desired goal.

# ****CarTel: a distributed mobile sensor computing system****

<http://dl.acm.org/citation.cfm?id=1182821>

*CarTel* is a mobile sensor computing system designed to collect, process, deliver, and visualize data from sensors located on mobile units such as automobiles. A CarTel node is a mobile embedded computer coupled to a set of sensors. Each node gathers and processes sensor readings locally before delivering them to a central *portal*, where the data is stored in a database for further analysis and visualization. In the automotive context, a variety of on-board and external sensors collect data as users drive.CarTel provides a simple query-oriented programming interface, handles large amounts of heterogeneous data from sensors, and handles intermittent and variable network connectivity. CarTel nodes rely primarily on opportunistic wireless (e.g., Wi-Fi, Bluetooth) connectivity to the Internet, or to "data mules" such as other CarTel nodes, mobile phone flash memories, or USB keys-to communicate with the portal. CarTel applications run on the portal, using a delay-tolerant continuous query processor, ICEDB, to specify how the mobile nodes should summarize, filter, and dynamically prioritize data. The portal and the mobile nodes use a delay-tolerant network stack, *CafNet*, to communicat.CarTel has been deployed on six cars, running on a small scale in Boston and Seattle for over a year. It has been used to analyze commute times, analyze metropolitan Wi-Fi deployments, and for automotive diagnostics.

Scholar:

# Providing accident detection in vehicular networks through OBD-II devices and Android-based smartphones

<http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6115556&tag=1>

The increasing activity in the Intelligent Transportation Systems (ITS) area faces a strong limitation: the slow pace at which the automotive industry is making cars "smarter". On the contrary, the smartphone industry is advancing quickly. Existing smartphones are endowed with multiple wireless interfaces and high computational power, being able to perform a wide variety of tasks. By combining smartphones with existing vehicles through an appropriate interface we are able to move closer to the smart vehicle paradigm, offering the user new functionalities and services when driving. In this paper we propose an Android- based application that monitors the vehicle through an On Board Diagnostics (OBD-II) interface, being able to detect accidents. Our proposed application estimates the G force experienced by the passengers in case of a frontal collision, which is used together with airbag triggers to detect accidents. The application reacts to positive detection by sending details about the accident through either e-mail or SMS to pre-defined destinations, immediately followed by an automatic phone call to the emergency services. Experimental results using a real vehicle show that the applica- tion is able to react to accident events in less than 3 seconds, a very low time, validating the feasibility of smartphone based solutions for improving safety on the road.

ECO-DRIVER: USING AUTOMOTIVE SENSOR DATA

TO CONTROL MOBILE DRIVING GAMES

<http://sam.iai.uni-bonn.de/people/PascalBihler/paper/EcoDriver-IADIS-GET2010.pdf>

Nowadays, context-aware mobile gaming is mainly focused on GPS location as the sole context information. This paper

extends the scope by introducing the idea of using automotive sensor data as an input for games played by the cars’

drivers. We present the results of a short online survey on the subject and demonstrate the applicability of the approach

with a mobile game prototype called “Eco-Driver”. As this serious game is not only a simulation, but augments the

driving reality by effectively reducing the fuel consumption on certain routes, it gives strong feedback to the driver.

Besides setting the stage for a new genre of games to be played while driving, “Eco-Driver” technically demonstrates a

way to extend an existing browser oriented location based gaming framework with additional sensor input.