The Feetback Cycle: Leveraging Everyday Technologies to Change the Way We Move

Design: Use: Build: University of Washington

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my phd thesis focus is: the design and study of **eco-feedback technology**

**technology** that **provides feedback** on individual or group behaviors with a goal of **reducing environmental impact**
technology that intentionally changes attitudes or behaviors through persuasion and social influence

- B.J. Fogg, 2003

my work combines behavioral science, environmental psychology and computer science
motivation techniques

- information
- goal-setting
- social comparison
- historical comparison
- commitment
- incentives / disincentives
- rewards / penalties
- feedback
- ....

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1. low-level feedback
2. high-level feedback
render the invisible

feedback not only draws attention but also provides a learning function

-Van Houwlingen & Van Raaij, 1989

the power-aware cord

- Gustafsson & Gyllenswärd, CHI 2005
goal-setting

1. direction attention
2. have energizing function
3. affect persistence
4. can affect behavior indirectly

Latham & Locke, 2002
rewards / penalties
Figure 1. a) The Omron HJ-112 pedometer, b) the pedometer in use, and c) the Nokia 6600 mobile phone running Houston.

Figure 2: Houston screen shots. (a) Main screen, (b) detail screen, (c) recent comments, and (d) trending information.
ubifit

- fitness monitoring application
- automatically senses activity
- at-a-glance goal information

effectiveness of the ubiFit glanceable display

Study occurred over Thanksgiving, Christmas, and New Years.
ubigreen
exploring the use of mobile phones as a persuasive eco-feedback technology to sense and feedback information about personal transportation

Froehlich et al., CHI2009
formative studies of transportation choices and behaviors

download myexperience here:
http://myexperience.sourceforge.net
studying transportation decisions

in situ
sensing transit

msp

cell towers

user

1

Drive Alone

Walk

Bike

Train

Carpool

Bus

minimum activity duration: 7 minutes
Raw sensor data to transmit activity

- Collect raw sensor readings
- Calculate features
- Produce margins

Generated at varying rates
Generated at ¼ second intervals

Mean, median, range, etc.
Measure of confidence for particular activities

Smooth margins into meaningful actions

Smoothing is defined by the application, not the MSP

Send margins to phone via Bluetooth

everything resets on sunday
tree

polar bear
Seattle:
- Office admin: 4 weeks
- Consultant: 3
- Program manager: 3
- Programmer: 4
- Consultant: 4
- Student: 1

N=6

Pittsburgh:
- Sales clerk: 4 weeks
- Law enforcement: 3
- Student: 1
- Engineer: 3
- Student: 2
- Student: 2
- Student: 1

N=7
I would like more information about carbon emission savings.

- Participant 15

I would like to see some graph or raw data.

- Participant 13

I liked the tree because it was, to my mind, a pretty progress bar. I could tell the difference at a glance.

- Participant 11

I would like more information about carbon emission savings.

- Participant 15
increased awareness

It’s omnipresent
- Participant 9

It definitely keeps you more aware of it [personal transportation] every single day. You use your phone every single day so you know.
- Participant 6
engagement

anticipation
I liked that we didn’t know what it was going to do. Like when your phone turned from leaves into flowers and then apples.
- Participant 15

sustaining anticipation
I want to have different stories every week … to maintain curiosity in the app.
- Participant 8

If you opened it up, people would generate their themes online and share them. It would be cool.
- Participant 10
Some **people at work knew about the polar bear** and every day they asked me about it. ‘**Did you get a seal today?**’

- Participant 14

I **would show my friends**, ‘**look at my tree, isn’t it cool, look at the flowers...**’ They thought it was pretty cool.

- Participant 9
One participant stated that when a trip hadn’t been automatically recorded, “I felt like I was being cheated out of my ‘points’”

- Participant 15

I want to see the final stage I can get to...

- Participant 7

One participant stated that when a trip hadn’t been automatically recorded, “I felt like I was being cheated out of my ‘points’”

- Participant 15

concept of gaming

our real-world interactions as input to games
nike+ipod tracks your runs and provides low-level and high-level feedback about performance
What is Nike+ Active?

A fun way to motivate you to get moving. With each step you’ll uncover new goals, reach new heights and track how active you’ve become.

**Become Nike+ Active**
Sync your iPod nano Pedometer data to track daily and weekly progress. See how you stand compared to the entire Nike+ Active community.

**Conquer Yesterday**
Improve your personal best and take on bigger goals as you go.

**Show off your Triumphs**
Share your Nike+ Active accomplishments with family and friends.

Counting All Your Steps

Every step matters with the new iPod nano.

- iPod nano can now track your steps and calories burned with its new built-in pedometer
- An Always-On mode monitors your activity in the background or you can set exactly when you start and finish a walk
- See your hourly, daily, weekly and monthly steps walked and calories burned on the iPod nano
- Connect your iPod nano to iTunes to automatically sync your data to Nike+ Active

Purchase the new iPod Nano
CLIMB A
100 STORY SKYSCRAPER
4,500 steps
(225 calories)

2,263 STEPS
50% Completed
difficulty estimating levels of personal activity

underestimate food

overestimate levels of activity
across air nyc nearest subway iphone app
http://onebusaway.org/
real-time rome

MIT’s SENSEable City Lab, directed by Carlo Ratti

Madonna Concert
Cellphone activity in Stadio Olimpico Rome
2006-08-06

19:00

night morning afternoon evening

But the attacks came minutes from 18.00 it staggered.
At Rome’s Olympic Stadium
Located about three kilometres from the Vatican
During the song Live to Tell...
Madonna appeared against a mirrored cross
understanding human mobility patterns

thank you!

google: “Jon Froehlich”