Formative feedback

A formative user experience evaluation was performed on the prototype implementation of CyclNav by Andrew Dennis and Danny Horodniczy. Our notes and results are attached.

The prototype was complete enough to perform the entire testing plan proposed by the CyclNav team. Furthermore, this plan was considered to be sufficiently thorough as to not require additional exercises.

# Who is the user?

We tested the system on Yannick, a 25 year old Ph. D student who rides his bike for leisure – about once a week. As he is someone who doesn’t use his bike on a fixed route, he fits very well the target user of the CyclNav system.

# Results

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| **TASKS** | **COMMENTS OF THE USER** | **OBSERVATIONS OF THE EVALUATOR** |
| *Please open the application called* ***CyclNav*** *and input a destination address.* | *“The input box is weird. It has a grey background with a dark grey label, which makes it hard to read.”* | *No difficulty.* |
| ***Change*** *the destination address. Then* ***Cancel*** *the destination.* | *“There is no cancel button.”* | *Look of confusion?* |
|  | | |
| *Vibrational feedback on both handlebars, 2 times for 1 second each with a gap of 0.5 second.* ***Status Ready.*** | *“Ah! It means ‘okay, let’s go’”.* | *No difficulty.* |
| *Vibrational Feedback on one side of handlebar for light pulses (2 short pulses) (50 m).* ***A turn is nearby.*** *Vibrational feedback on one side of handlebar for hard pulses (2 long pulses) (5 m).* ***Immediate turn.*** | *“That’s a left turn… That’s also a left turn.” “I had to remember the user manual.”* | *No differentiating between “soon” and “NOW”.* |
| *Vibrational feedback on the handlebar for 7 seconds. You have* ***missed a turn****.* | *“All I caught is that something is wrong.”* | *Probably more intuitive to the acquainted user.* |
| *Vibrational feedback on both handlebars, alternating short pulses (3 on each side) You have arrived* ***near your******final destination.*** | *“Counter-intuitive unless you’ve read the user manual.”* | *Look of confusion/frustration.* |
|  | | |
| *Please play a song using the* ***Play/Pause button*** *on the handlebars.*  *Please try* ***pausing and resuming****.* | *“It’s clear, but I have to look.”* | *No difficulty, user briefly looked down at the handlebars.* |
| *Please* ***change the volume*** *of the playing song, first increase it, and then decrease it.* | *Idem* | *It’s not clear what the control is supposed to be. A knob? One of those disk things with teeth that you rotate?* |
| *Please try playing the* ***next song*** *and then return to the* ***current song****.* | *Idem* | *User took too long looking down at the handlebars to figure out which button was which, would have been hit by a truck* |
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# Benchmark tasks and design critique

The CyclNav everyday workflow breaks down in three parts; there is initially a **setup** aspect, as the user enters an address into his or her phone. Haptic feedback is provided on completion by both the phone and handlebars. The second part is the **navigation**, during which the user rides his bike, receiving assistance on his destination through the handlebars’ vibrating motors. The final part is **music control**, which happens concurrently to navigation.

The setup portion of the test went smoothly; opening the app and selecting a destination was no challenge at all. The user was slightly unsettled by the unconventional, unpolished look of the search box.

The navigation part was more difficult – understandably, as it is the team’s focus of research. Specific pain points include:

* The difference between “turn left soon” and “turn left now” was clear to the evaluator, but it was not very clear which was which without referring to the user manual. The current mode of operation feels ambiguous; it could effectively be replaced by a more continuous feedback, communicating a gradually increasing feeling of urgency to the user.
* The “turn was missed” signal felt ambiguous, and it was not clear what the workflow was to recover from user error, improvisation, or likewise. Our recommendation is to either calculate a new trajectory, or to provide feedback to the user that will help him or her get back on track.
* The feedback for “destination reached” was not intuitive; it could be supplemented by some sort of audio feedback from the phone.

Aside from the debatable safety issues, playing music is reasonably intuitive. One criticism is that the unacquainted user spent a lot of time looking at the handlebar and removing his hand from the handlebar to reach the button. Our recommendation is to place the buttons closer to the handlebars, such that the user can reach them without removing his hands from the handlebars.

The button layout is also thought to be counter-intuitive; the “next track” and “previous track” buttons should be grouped together with the play/pause button; the volume wheel could then rest on the other handlebar.

## Overall appreciation

The concept is felt by the user to be very useful, as it might enhance the safety of people who choose to listen to music as they ride their bikes. The individual vibration patterns, however, do not communicate the information in a clear, intuitive way.

# Test plan critique

The provided test plan felt mostly appropriate for the product’s intended purpose. A representative testing environment was out of the question, given the functionality of the prototype. Given the finished product – properly mounted on a bike – it will be possible to conduct a more in-depth evaluation on the road, using a hands-free phone headset and a camera. This will allow the CyclNav team to address potentially unforeseen issues – what if, for example, the bumpy roads of Montreal interfered with the haptic feedback?

One criticism is that the test plan was quite low-level, and did not put enough emphasis on chaining together full workflows. This would have helped the user get into the right mindset to evaluate what is essentially a highly contextual user experience.