

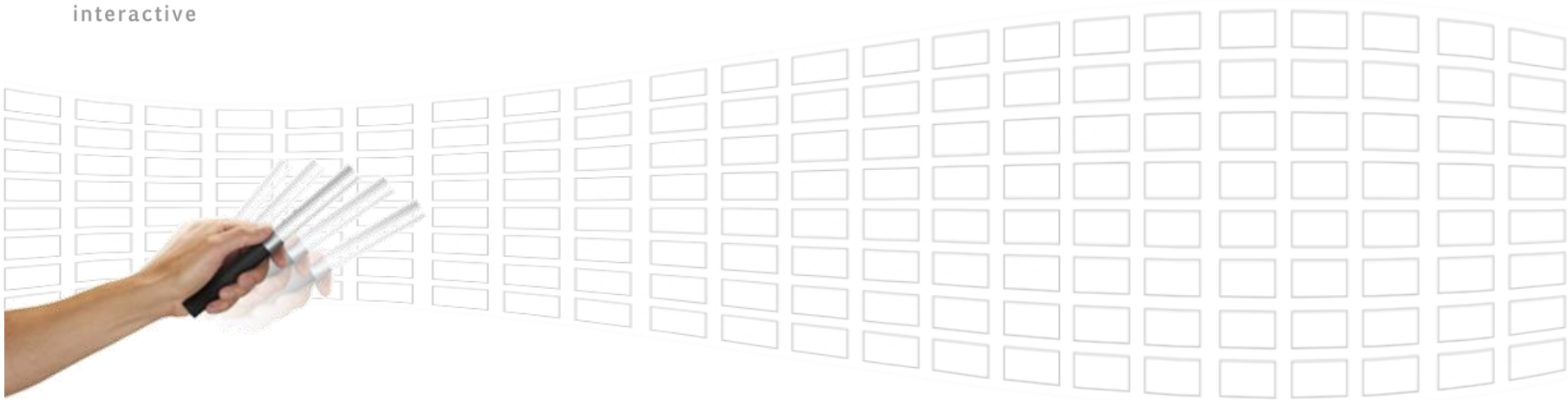
uFLO browser explained

White Paper on the user interface design



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How can you introduce the absolute pointing control into your products and achieve that 'wow' impact, and implicit ease of use?

Philips Media Interaction and FLO interactive have developed together expertise in this area. In this White Paper we give some tips on basic principles, and illustrate a few best-practice ideas.

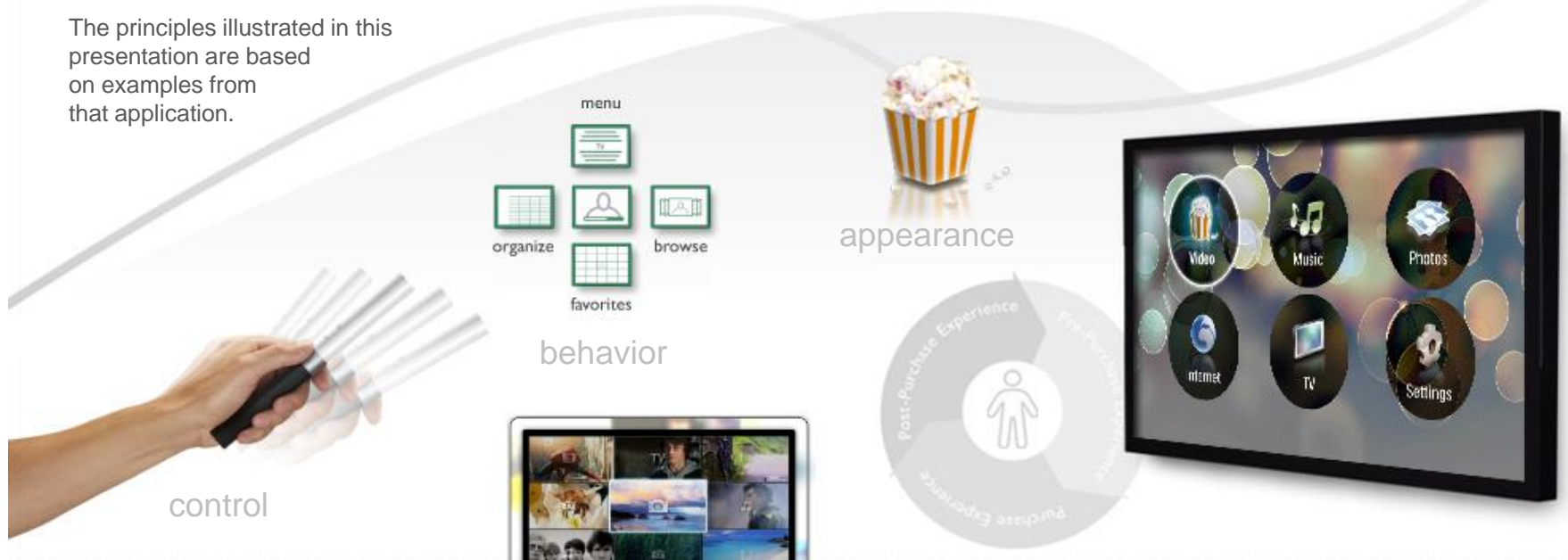


interactive

FLO interactive is a compact design company and consultancy with wide experience in the fields of design and realization of user interfaces for consumer and professional products and services.

For Philips we created a dynamic media browsing application that effectively demonstrates the qualities of the uWand technology.

The principles illustrated in this presentation are based on examples from that application.



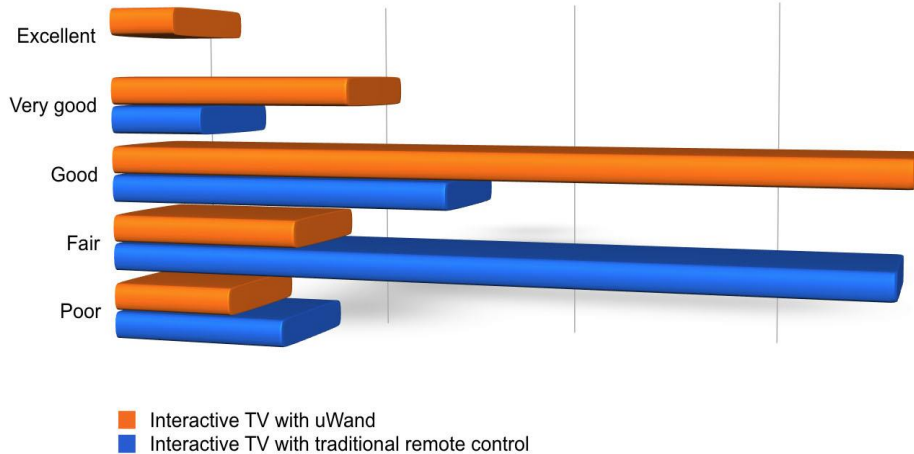


uWand RemoteTouch technology

Philips Media Interaction offers innovative and natural user interaction technologies to the market. The first technology out of this business group is the uWand.

uWand is a natural pointing technology that offers solutions for navigating Smart TV's. When embedded in remote controls it gives users fluid and accurate direct pointing and 3D gesture control. It is an inherently intuitive experience for point-and-click and gesture control

Higher rating for services controlled through pointing

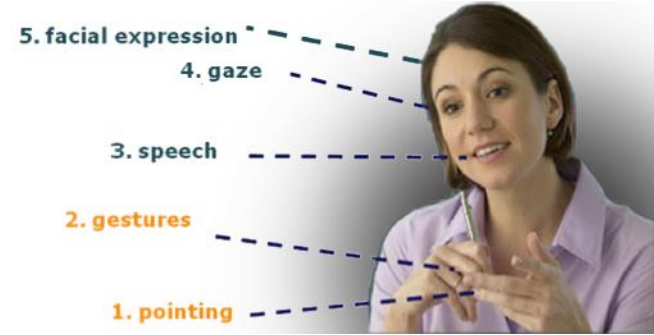


Focus groups and actual in-field user tests have proven that pointing is an intuitive way of navigating interactive services offered through Smart TV's. Even when applied to interfaces for traditional 4-way control – i.e. not optimized for pointing like the uFLO browser.

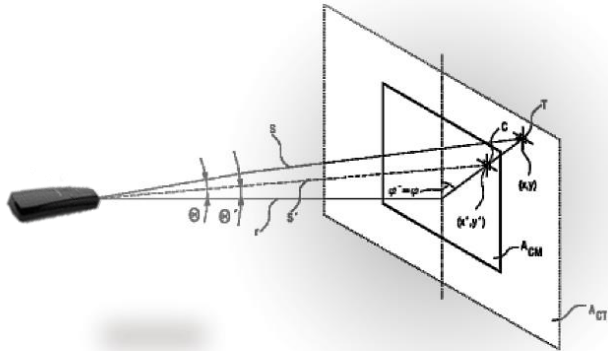
In product placement tests for interactive television, uWand dramatically improved user satisfaction. When uWand control was introduced, the “good” to “excellent” rating of the service moved from 32% to 72% . This improvement in satisfaction was reflected in increase of service use.

uWand is based on consumer behavior

Pointing is the most intuitive interaction for humans; it is the first thing small children can do and it is the only interaction model that is not taught. Philips developed this intuitive user interaction paradigm, that allows consumers to actually point to the objects on screen similar to e.g. touch screens.



Increase intuitiveness by staying close to normal people behavior



A lot of time is spent on understanding human factors;

Philips advanced algorithms delivers stable cursor control:

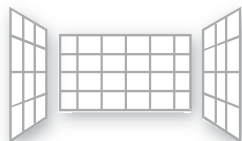
- eliminating user's hand tremor
- adjusted to the angle of pointing and the distance to the TV, resulting in a constant sense of control

Because of this the uWand technology delivers the best user experience based on direct pointing.

New control tasks enabled by uWand



Control a variable through rotation



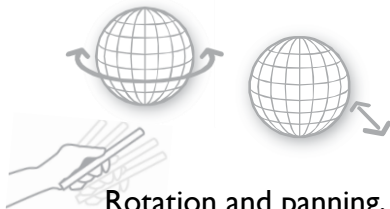
Spatial selection, grids and paging



Gaming with gestures



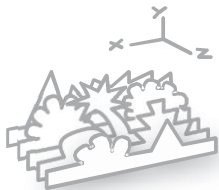
Easy to reach screen edges



Rotation and panning, zoom control (z-axis)



Scroll through rotation



Z-axis control to select a layer (2,5D)



Pick up moving objects, drag and drop on target



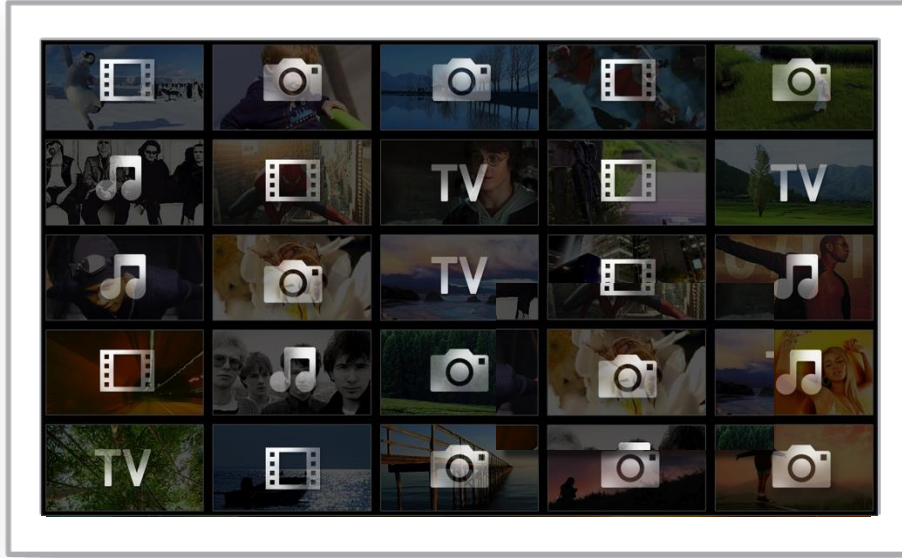
Point & shoot

We tested absolute pointing against other input technologies. Users found these illustrated control tasks to be natural and well suited to the uWand technology.

When applying these tasks in a UI take into account:

- Users have to learn them; visual cues and feedback are essential
- Combining actions can be tricky and may lower the performance
- Consistency is crucial. Applying a method in one case creates expectations for other use cases

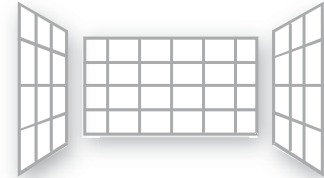
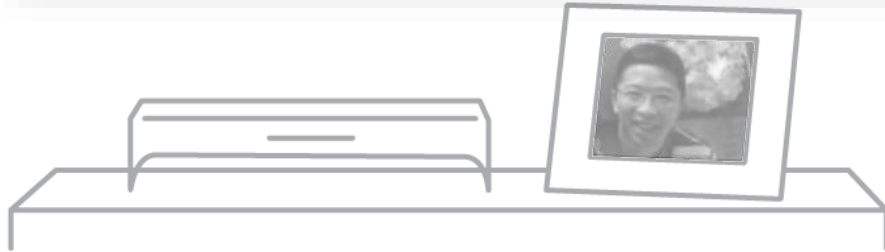
Basic Principles – layout



A Basic principle is to use open layouts for content, such as a grid view with large cells.

Fill the screen with content instead of text or UI graphics ... content is colorful and adds interest.

Design for an optimum between ease of hitting a target, and the number of items on screen.



Basic Principles – animated rollover

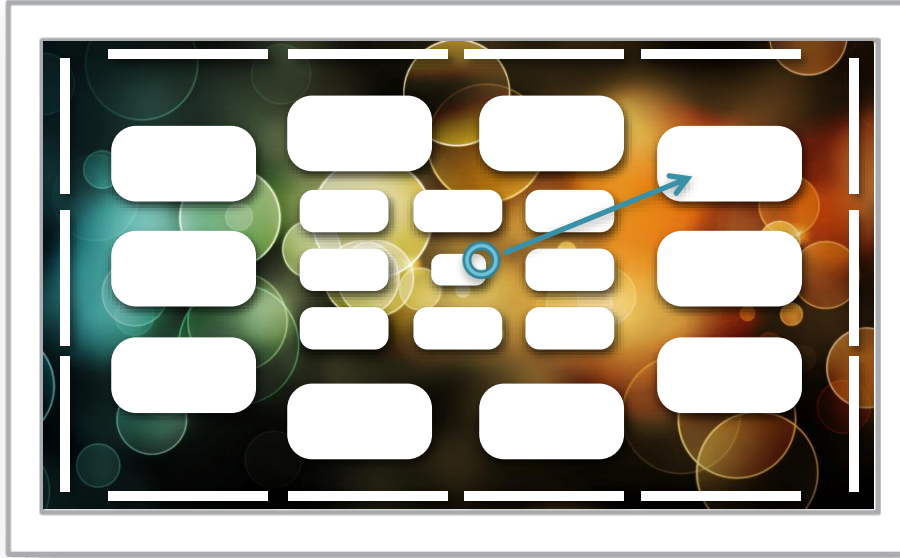


In the home menu we apply an animated roll-over to reveal more information about the six functions. This behavior makes the interface dynamic and invites the user to explore the screen.

The roll-over principle does work particularly well with the absolute pointing technology of the uWand, a clear advantage over touchscreens which cannot support such behavior.



Basic Principles – Fitts' law



$$T = a + b \log \left(\frac{d}{s} + 1 \right)$$

T=movement time to target, a=0.230sec, b=0.166sec, d=distance to pointer and target, s=diameter of target

Fitts' law is a widely used model to predict the speed of pointing tasks in UI's.

The illustration shows a layout from the center that states :

- The further a button is located from the starting position, the larger it should be
- Objects on edges and corners are particularly easy to acquire, and can be smaller in size and less obtrusive
- A radial arrangement is faster to use and has a lower error rate than a linear one (e.g. in a pie menu)

We use Fitts' law as a basis to design novel lay-outs and edge behaviors.

Basic Principles – edge menus



The content browser is a typical case for edge menus:

- The upper edge can be reached effortlessly and is a perfect place for a menu or tab bar
- Menu bars can be elegantly expanded on roll-over (see below)
- Usually the left and right edges are preserved for paging or scrolling. The active area can be larger than the arrows self
- Avoid placing pop-up elements at the bottom area because that is where the cursor lands when the user lowers his arm



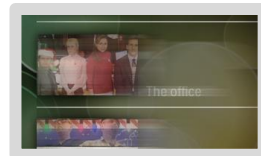
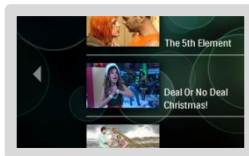
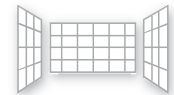
Easy to reach edges

Basic Principles – provide alternative control



To cater for individual preference there are 3 ways to scroll in the content browser:

1. clicking on arrows to page suits users who look for onscreen cues
2. Dragging the grid suits users who prefer direct manipulation
3. A Flick gesture suits users who like shortcuts



Designing levels of redundancy like this is good, as long as the preferred method of a user is consistently available.

Basic Principles – heads-up navigation model



We maintain a clear spatial model to help the user understand how to navigate through the screen edges and to make the remote control task fully heads-up.



There is only one key that triggers the navigation menu. Each screen edge hosts a consistent function. The user can see what is available and over time use becomes automatic. Such principles are essential for reducing the number of buttons on the remote.

Basic Principles – direct manipulation



In the photo browser we apply Direct Manipulation in the richest way on photo's: drag (x/y), click and zoom (z), and click and rotate (radial).

This is very powerful and natural. The user interacts with content and does not need to activate a mode upfront, like in more traditional 4-way interfaces or like with mouse control.



rotation, panning
(x and y-axis)



zoom control
(z-axis)



drag and
drop



The Tag cloud browser



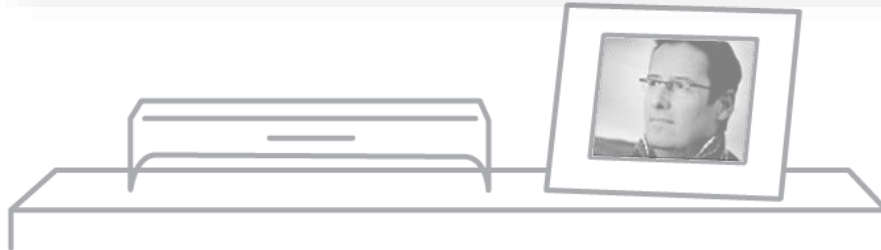
The Media Browser has a radial layout for the tag cloud, around the text entry field. This layout is efficient according to Fitts' law, and suggests a depth perspective that works well with the zoom function. Notice the animated build up of the tag cloud. This emphasizes the radial layout and gives the browser a playful character.



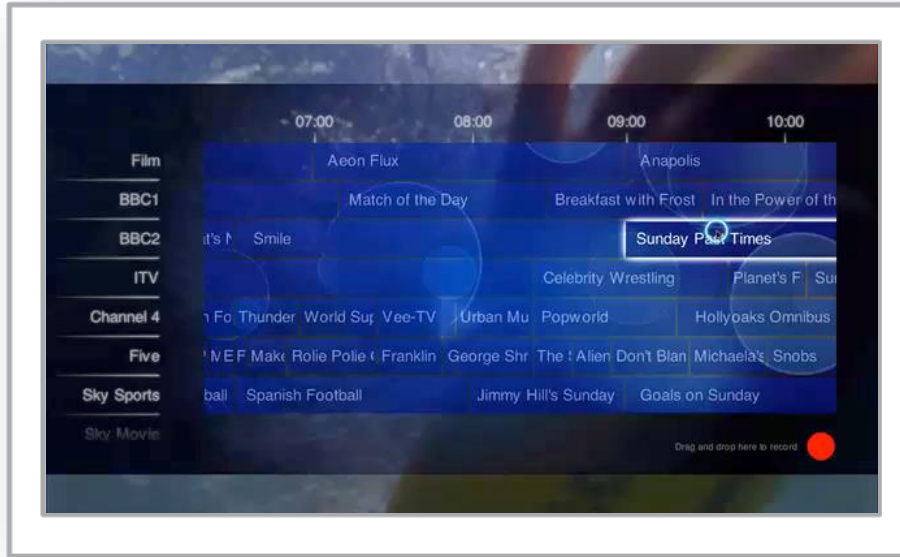
Fitts' law



zoom control
(z-axis)



The Program Guide



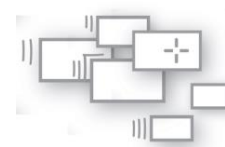
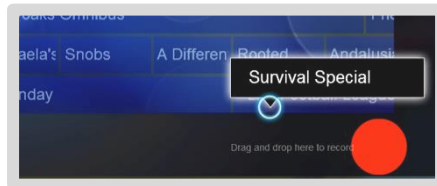
In the program guide quite a few control actions are combined.

Users can click on programs for tagging.

The timeline can be scrolled by dragging the grid or by rotating the remote.

Programs can be 'teared off' in the vertical direction and can be dragged on to the record button.

Each of these actions make sense to a user. The trick is to combine these actions without interference and degradation.



drag and drop



rotate to scroll

Conclusion

In this white paper we touched upon our process to link consumer observations to key control tasks with the uWand technology. Supported by generic principles and theory this led to novel UI solutions.



The aim of FLO interactive is to help you to conceive and realize a coherent and fluid experience for your end users

We do this with great attention to Appearance, Behavior, and Control; and in short cycles with rapid prototyping

We offer a range of services to help you realize this fluid experience, see the next page. We can tailor this entirely to your needs

Visual identity,
navigational
affordances, icons,
buttons, animations

appearance

Navigation model,
dynamic behavior,
widgets and (flash)
prototyping

behavior

Device handling,
remote controls,
physical input and
local feedback.

control

FLO interactive services

Business Innovation

Design/Architecture

Implementation

Value Proposition

- User centered Innovation Workshop
- Semi-interactive simulations of new proposition scenario

Pre-concept, Principles

- Stakeholder requirements analysis
- Experience flow analysis & end user observations
- UI opportunity & direction setting workshop
- Storyboarding of early UI concepts
- Rapid concept prototyping for early consumer feedback

Concepts, Architecture

- Create the visual identity for the UI
- Proof of concept demos & tests to support architecture choice
- Assessment of critical use cases & quality criteria (CTQ)
- Functional HW/SW concept simulation
- Deployment workshops

UI Specs, Guidelines

- Create screen designs, animations and master files
- Develop the full navigation structure
- Develop and optimize new control widgets
- Consultancy on form factor design and key reduction

Quality Control, Assets, testing

- Creative direction
- Support acceptance tests & conclusions
- UI asset creation
- Fine tuning of look and feel on platform



appearance

behavior

control

As Creative Directors with long industrial experience the three partners of FLO interactive are uniquely able to deliver expertise across a wide range of cross-media environments, incorporating and optimizing state-of-the-art technologies such as uWand.

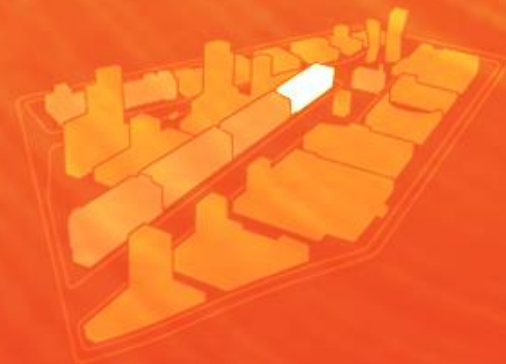
We look forward to work with you!

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