Motion & Gesture Interactions in the digital age

Antonio De Pasquale
Senior Interaction Designer at frog
@myinteraction

Simone Lippolis
Design technology II at frog
@leepolis
My name is Antonio De Pasquale
I'm a Senior Interaction Designer at frog Milan

A little about me

I'm specialized in digital interfaces & user experience
I'm passionate about the "aesthetics" of movement
I'm from Sicily and I love the sea.

@myinteraction
My name is Simone Lippolis
I'm a Design Technologist II at frog Milan

A little about me

Simone Lippolis is a Design Technologist at frog design with over 10 years of experience in software and web development.

@leepolis
Motion, what?
Motion Graphics

Motion graphics are graphics that use video footage and/or animation technology to create the illusion of motion or rotation, and are usually combined with audio for use in multimedia projects. Motion graphics are usually displayed via electronic media technology, but may be displayed via manual powered technology.

* Wikipedia
Motion Graphics Design Interactions

Motion Design is a subset of graphic design in that it uses graphic design principles in a filmmaking or video production context (or other temporally evolving visual medium) through the use of animation or filmic techniques. Although this art form has been around for decades, it has taken quantum leaps forward in recent years in terms of technical sophistication.

* Wikipedia
Objects that don't move don't interact. An interaction is some sort of communication, and communication is about movement: our vocal cords vibrating as we speak, our hands and arms writing or typing as we send email or instant messages, sound and data moving between two entities.

Dan Saffer - The element of Interaction Design
Without motion, there can be no interaction.

You press a key, and an email window closes.

There is motion on your screen.

Dan Saffer - The element of Interaction Design
From the first personal computing with
Static interface and physical controls

Motion & Gestures interactions in the digital age
To an incredible new powerful devices with

Dynamic interface and Motion control
Introduction

Motion Design & Digital Artifacts
Animation Design Principles

Code (and) Motion

Technology Vs Motion
Design with code
INTRODUCTION
Motion Design & Digital products

I was giving the demo to someone a little while ago, and I finished the demo and I said what do you think? They said, ‘You had me at scrolling.’

STEVE JOBS, 2007 (on the iPhone inertial scroll feature)
The beginning

Games used motion for the first time to visualize the effect of a specific interaction in the digital space.

Motion Design & Digital products
Web 1.0: Java & Gif

At the beginning of the Web, few technologies allowed motion in web pages mostly just for eye-candy.
The Golden Age of Flash

From a simple animation tool, Flash changed the way designers' experiences with motion & interaction.

TheVoid, 1998
Animated menu, interactive objects
http://www.thevoid.co.uk/index.html

2Advacend, 2000
Screen transition, Loading screen
http://v2.2a-archive.com/flashindex.htm

LeoBurnet, 2006
3d navigation, motion detection
http://v2.2a-archive.com/flashindex.htm
The App World

With the explosion of mobile apps, motion started to become a core part of the interaction models

Revealing hidden controls
Card 3d parallax
Top-down bouncing menu

Motion & Gestures interactions in the digital age
The Web Reloaded

With the introduction of the new w3c specifications, html & css added new life to motion & dynamic on the web
Gesture & Motion

Gesture recognition became a common pattern on console and motion interactions was the right answer to show a new kind of affordance. Physical Motion patterns becomes virtual interactions.
Introduction  Motion Design & Digital products

The Future

New desktop physical control, css4 html6, smartphone gesture recognition, hands & fingers tracking...

CSS Images Level 4: cross-fade() example
You need a Webkit nightly in order to properly see this page!

Displaying a single image.
```css
cross-fade{
url("logo-box.png"),
url("logo-base.png")}
```

Displaying halfway through the second image.
```css
cross-fade{
url("logo-box.png"),
url("logo-base.png"),
0%}
```

Motion & Gestures interactions in the digital age
The Evolution of Motion Interaction

Technology

1978
Pong, 1978

1980
Gif, 1980

1989
Applet Java, 1989

1993
Flash, 1993

2000
Safari + Webkit

2005
Flash 3d, 2005

2007
Webkit

2008
Leapmotion

2013
iOs 7, 2013

Motion

1978
Simple animation
1980
Interactive UI elements
1989
Interactive UI elements
1993
Full animation engine
2000
3d, video, cam & motion tracking
2005
Native animation in app gesture
2007
Web Native animation
2008
Natural UI
Today
Gestural interaction
Advanced motion patterns

Motion & Gestures interactions in the digital age
What are the UX principles that helps technologist & designers in shaping the next generation experience?
Disney animation principles

Disney’s Twelve Basic Principles of Animation is a set of rules that defines a realistic impression of a motion with the basic laws of physics. Some of these principles have great relevance for the animations in the user Interface.
Introduction

Animation Design Principles

12 RULES OF ANIMATION

Motion & Gestures interactions in the digital age
Many of this principles can be applied to 6 macro UX categories to improve functionality and to increase the affordance of the actual patterns.

* Johannes Tonollo, Meaningful Transitions - http://www.ui-transitions.com
Extension

Spatial Extension reduces the complexity of the user interface by extending the virtual space.

Space extension
Good for Mobile
Extra space for info
3d as an additional info layer
Orientation

Orientation describes the way in which a logical connection can be created and visualized between objects and object's states.

Directions
Content position
Explaining IA
Helps exploration
Introduction

Motion & Gestures interactions in the digital age

Feedforward

Feedforward functions as a conveyor of possible interactions. An illustrating animation is used to prepare the user for the outcome of an action.

Increase affordance
Anticipate hidden interactions
Tutorial & help
explain new pattern
Feedback

Feedback comprehensively indicates what the result was of the user's interaction.

Start/End of a process
Object activation
Accepted interactions
Highlight

Highlighting is the guidance of attention by using animations. This category draws the user's attention and clarifies changes of states in the user interface, which otherwise might be missed.

Focus on action trigger
Display active object in the interface
React to user activity
Awaking

Awaking Controls allows the user to focus on contextual controls. They appear when needed, and disappear as soon as they are no longer needed.

Trigger for invisible interactions
Change of status
Revealing new information
Showing extra controls
CODE (and) MOTION
Technology makes what was once impossible possible. Design makes it real.

MICHAEL GAGLIANO
Technology Vs Motion

Why the web?

- Large audience both on desktop & mobile
- New visual effects with good retro-compatibility
- Web technologies enable different things: from one page apps to games
Development Tools

How we build this examples:

**HTML 5** + **CSS 3** + **JS 5**

To create the structure of the layout and define a hierarchy between objects

To add visual appeal to the elements, and to define, where possible, animations and transitions

To manipulate HTML content and to compute CSS properties on-the-fly
General principles

Always prefer CSS3 over JavaScript animations

BUT

Without JavaScript it will be impossible

to create complex animations and transitions.

That said, try to:

1. Use JavaScript only to compute new properties of each element, and to dynamically change CSS

2. Use JavaScript to extend the events that the browser exposes, to add new functionalities and enable the user to interact with your apps in more natural ways
The examples

Demo code

These examples are not real-life cases!
It is almost impossible that you'll have to deal with a pre-defined number of elements in a page, and that these elements have pre-defined positions but can be used as inspiration.

http://2m3.it/codemotion
Animation patterns

For every category we selected a relevant example to show the motion characteristic and how to build it in web browser.

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension</td>
<td>Half Flip, Folding, Area Split</td>
</tr>
<tr>
<td>Orientation</td>
<td>Fan of stack, Page turn, Saving</td>
</tr>
<tr>
<td>Feedforward</td>
<td>Solidarity, Affordance, Hidden features</td>
</tr>
<tr>
<td>Feedback</td>
<td>Availability, Heal, Position accepted</td>
</tr>
<tr>
<td>Highlight</td>
<td>Blur to, Change depth to, Expand to</td>
</tr>
<tr>
<td>Awaking</td>
<td>Mode switch, Swipe to delete, Spring refresh</td>
</tr>
</tbody>
</table>

* Johannes Tonollo, Meaningful Transitions - http://www.ui-transitions.com
1. Folding

A transition to show that only a part of an object is visible.
By interacting with it, it reveals to full size.

- Revealing selectors
- Revealing hidden area: [http://capptivate.co/2013/11/19/taasky/](http://capptivate.co/2013/11/19/taasky/)
- Folding a list: [http://capptivate.co/?s=clear](http://capptivate.co/?s=clear)
Extension

2. Area split

A transition to show a direct connection between the object of interest and further information.

Folder area split

Message preview
http://goo.gl/IZABUf

Revealing additional space
http://media.idownloadblog.com/wp-content/uploads/2013/05/Stopwatch-for-Velox.gif

Motion and Gesture interaction in the Digital Age
Extension

3. Flip / Half flip

A transition to show a direct connection between the object of interest and further information.

Revealing extra space
http://capptivate.co/2013/11/19/445/

CSS Card flip
https://daneden.me/animate/

Flip screen
http://capptivate.co/2013/07/15/ifttt/
Orientation

1. Fan of stack

A transition to explain the arrangement of objects, by showing how they are placed.

Example

- Revealing menu: http://capptivate.co/2013/08/14/your-extra-life/
- Connected items: http://capptivate.co/2013/06/25/lapka/
Motion and Gesture interaction in the Digital Age

2. Page turn

A Transition to explain the information architecture of the list in a narrative way.

Orientation

- Page turn to reveal menu
  http://capptivate.co/?s=ctica

- Flipping pages
  http://www.macinet.it/flipboard-web-magazine/

Motion and Gesture interaction in the Digital Age
Orientation

3. Saving indicator

A transition to tell the user where to find the object after saving/bookmarking/downloading.

Saving event
http://capptivate.co/2013/06/26/lift/

Adding a new item
Feedforward

1. Affordance

A transition to present a possible interaction.

Card movement
http://capptivate.co/2013/11/23/potluck/

External menu navigation
http://capptivate.co/2013/11/23/airbnb/

Open/close main navigation
http://capptivate.co/2013/11/07/breezi/
Feedforward

2. Hidden features

A transition to explain what is necessary to activate a hidden function.

Show additional information
http://capptivate.co/?s=kickstarter

Revealing additional function
http://capptivate.co/?s=clear
3. Explaining directions

A transition to explain a specific directional interaction

Horizontal slide to unlock
http://youtu.be/3Jl000140SU

Slide indicator for final position
1. Availability

A transition to show the progress of a loading behavior of individual objects.

- Progressive loading
  [Link](http://capptivate.co/2013/06/25/expereal/)

- Data/Map content loading
  [Link](http://capptivate.co/2013/06/25/ribbon/)

- Content loaded
  [Link](http://capptivate.co/2013/09/30/phq4-3/)
Feedback

2. Heal

A transition to show that the objects of a list reacts directly on the user’s input. The interaction is validated.

Content organization & position feedback
http://useyourinterface.com/post/55475407955
Feedback

3. Position accepted

A transition to show that a movement into a new position is accepted.

Selecting possible tiles
http://capptivate.co/2013/09/18/grid/

Show additional information
http://www.idownloadblog.com/2013/09/26/ios-7-the-ultimate-safari-guide/
1. Change depth to
A transition to direct the user's view by an attention grabbing animation of the object.
Highlight

2. Expand to

A transition to show which object is active on interaction by expanding it.

Keyboard magnify effect

Current selection
http://capptivate.co/2013/08/20/spendee/

Zoom on a specific area
http://capptivate.co/2013/08/12/dark-sky/
Highlight

3. Blur to

A transition to direct the user's view by an attention grabbing animation of the object.

Focus on the active area
http://vimeo.com/66395692
Awaking

1. Swipe to delete

A transition to support an intuitive interaction of deleting an object in a list.

Swipe to delete items (html version)
http://goo.gl/IMLjsUF

Swipe left / right to activate
http://vimeo.com/59504129
2. Spring to refresh

A transition to use the intuitive interaction of a list. By scrolling a list, the function appears underneath the related list.

Drag to refresh
http://azumbrunnen.me/wp-content/uploads/Twitter.gif

Load new contents
http://warezos.com/glide-app-for-ios-and-android/arefresh/
### Example

A transition to introduce new controls by sliding in. The moving of the items' labels underlines the importance of the new controls.

<table>
<thead>
<tr>
<th>Reminders</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Reminders" /></td>
</tr>
<tr>
<td><strong>6 Completed</strong></td>
</tr>
<tr>
<td><strong>Follow @Jshdvy on Twitter</strong></td>
</tr>
<tr>
<td><strong>Tell friends about UYI</strong></td>
</tr>
</tbody>
</table>

#### Task completed
http://useyourinterface.com/image/63324362515

#### Show additional controls selecting a row
http://goo.gl/KFDps2
Design with code

It's a good practice when you have:

**a Designer**

Coding and testing in real time a design solution, to highlight technology or UX/Interaction related problems on the go.

**a Developer**

It is always a good feeling not to be the last step in the production/design process, and this will lead to better products.
The future is already here. It's just not evenly distributed.

WILLIAM GIBSON
FURTHER READING
The Illusion of Life: Disney animation
Frank Thomas, Ollie Johnston
1995

Designing Interfaces
Jenifer Tidwel
2000
<table>
<thead>
<tr>
<th>Design principles</th>
<th>Motion resource</th>
<th>Motion patterns</th>
<th>Design &amp; Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation: from cartoons to the User Interface</td>
<td>Emotion and Motion: Games as Inspiration for Shaping the Future of Interface</td>
<td>Capptivate: a motion design library</td>
<td>The Guide to Css Animation and principles</td>
</tr>
<tr>
<td>Transitional interfaces</td>
<td>The Basic of Motion Design</td>
<td>UI Animations: a tumblr collection of UI patterns</td>
<td>Animate.css</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W3C CSS3 Animation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><a href="http://www.w3schools.com/css/css3_animations.asp">http://www.w3schools.com/css/css3_animations.asp</a></td>
</tr>
</tbody>
</table>
Thanks!

Follow us on twitter
@myinteraction • @simonelippolis

to continue the discussion!