Developing for touch

Peter-Paul Koch
http://quirksmode.org
http://twitter.com/ppk
Mobilism, 16 and 17 May 2013

Examples

- Please open the following page on your phone:
- http://quirksmode.org/touchevents
- It gives links to the test files I'll refer to later
- If you have a Windows 8 device, be nice and show your neighbours what's going on.

Best Viewed With

Your site should be best viewed on any device

- Desktop (all five browsers)
- Phone (any, not just iPhone and Android)
- Tablet (any, not just iPad)
- TV
- Game consoles
- Cars
- Refrigerators

Best Viewed With

Primary interaction modes:

	Mouse	Keyboard	Touch	Voice	Other
Desktop/laptop	√	√			
Phone		√	√		
Tablet			√		
TV					√
Car				√	
Refrigerator			√		
Consoles		√			√√√

Take with large grain of salt. Interaction modes will converge - but haven't quite yet.

It’s all about events

Stick with click

Stick with click

- click is not a mouse event
- click really means “activate”
- “I am now going to use this element for the task it’s meant to do”
- Works everywhere. Always.

Stick with click

- click is not a mouse event
- click really means “activate”
- “I am now going to use this element for the task it’s meant to do”
- Works everywhere. Always.
- But: slow. About 300ms delay between touch and the following of the link

The slowness of click

What does touching the screen mean?

- “I want to click on this element”
- “I want to scroll”
- “I want to zoom”
- “I want to hold my touch”
- “I want to double-tap”

Thus, a single touchstart event doesn’t give enough clues. The OS needs to wait a little while to figure out what you mean. Hence the delay.

Stick with click

- Fire scripts ontouchstart instead of onclick.
- That works
- but now YOU are responsible for making sure the user can zoom
- and scroll
- and double-tap
- and tap-hold
- So don’t do it. Don’t try to be too clever. Accept the medium’s limitations.

It’s all about events

Point is: does every interaction mode need its own events?

So far the answer has been

YES

So far the answer has been

YES

Why, though?

Interaction modes

In the beginning was the mouse -
and it had its own mouse events

Interaction modes

Then we discovered computers had keyboards and browsers keyboard events

and we had to adjust our scripts

Interaction modes

And then there was touch with its own events

and we had to adjust our scripts again

Separate events

Keyboard	Mouse	Touch
keydown	mousedown	touchstart
(keydown/press)	mousemove	touchmove
keyup	mouseup	touchend

Integrated events

Keyboard	Mouse	Touch
keydown	pointerdown	
(keydown/press)	pointermove	
keyup	pointerup	

This is Microsoft's idea, and it merits careful consideration.

(The Microsoft events also work for pen. I haven't tested this, though.)

Touch events

- touchstart
- touchmove
- touchend

Touch/mouse/pen events

- pointerdown
- pointermove
- pointerup

Example

- http://quirksmode.org/touchevents
- Drag and drop
- Works with minimal changes

Touch events

```
el.ontouchstart = function () {
  el.ontouchmove = function () {
    ...
  }
  el.ontouchend = function () {
    el.ontouchmove = null;
  }
}
```

Touch events

```
el.ontouchstart = el.onmspointerdown = function () {
  el.ontouchmove = el.onmspointermove = function () {
    ...
  }
  el.ontouchend = el.onmspointerup = function () {
    el.ontouchmove = null;
  }
}
```

Touch events

```
el.ontouchstart = el.onmspointerdown = function () {
  el.ontouchmove = el.onmspointermove = function () {
    ...
  }
  el.ontouchend = el.onmspointerup = function () {
    el.ontouchmove = null;
  }
}
```

Doesn't work.

Why not?

Microsoft’s approach

It turns out that you have to add one line of CSS:

```
-ms-touch-action: none;
```

Microsoft’s approach

It turns out that you have to add one line of CSS:

```
-ms-touch-action: none;
```

And no, I don’t much like that.

(But it gets worse. Just wait.)

Microsoft's approach

These are the -ms-touch-action values. They tell the browser which gestures are allowed:

`none`	`- nothing allowed`
`auto`	`- everything allowed`
`pan-x and pan-y`	`- scrolling x or y`
`pinch-zoom`	`- pinch-zooming`
`double-tap-zoom`	`- double-tap zooming`
`manipulation`	`- everything except double-tap`

Example

- http://quirksmode.org/touchevents
- -ms-touch-action
- Here are all the values. Play with them.

Event info

- touches array: contains all current touches
- changedTouches array: contains all touches that caused an event to fire
- targetTouches array: contains all touches on the target element

Event info

```
function handleTouch(event) {
   var currentTouch = event.changedTouches[0];
   var xCoor = currentTouch.clientX;
   var yCoor = currentTouch.clientY;
}
```

Event info

- But not in the Microsoft model
- The touches arrays don’t exist.
- Instead, we just read out the coordinates in the old-fashioned way.
- I think this is a good idea in 90% of the cases
- but in the remaining 10% we actually need a list of touch actions taking place, and there isn’t any.

Event info

```
function handleTouch(event) {
    var currentTouch;
    if (event.changedTouches) {
      currentTouch = event.changedTouches[0];
    } else {
      currentTouch = event;
    }
    var xCoor = currentTouch.clientX;
    var yCoor = currentTouch.clientY;
}
```

move

- touchmove continues firing as long as the user’s finger is on the screen
- even if it has left the element the event handler is defined on
- MSPointerMove, on the other hand, stops firing when the user’s finger leaves the element

Example

- http://quirksmode.org/touchevents
- Traditional and Microsoft move events
- Be sure to move out of the test element. The traditional events continue firing; the Microsoft ones don’t.

Gestures

- The MSPointerMove event doesn’t continue firing when you leave the element.
- But the MSGestureChange event does.
- Which brings us to gesture events ...

Gestures

- A coordinated action of two or more touches constitute a gesture. Example: pinch-zoom
- Apple (and only Apple) offers the gesturestart, gesturechange, and gestureend events that fire when a gesture takes place.
- Still, I've never used them, and not just because of the lack of support in other browsers. Why do we need them?

Gestures

Microsoft offers a lot of extra events:

- gesturestart, gesturechange, and gestureend
- gesturetap
- gesturehold
- contentzoom
- and more

Gestures

I think I’m in love ...

- gesturestart, gesturechange, and gestureend
- gesturetap
- gesturehold
- contentzoom
- and more

Gestures

... except that they don’t work ...

- gesturestart, gesturechange, and gestureend
- gesturetap
- gesturehold
- contentzoom
- and more

Gestures

Well, they do, but Microsoft has gone temporarily insane here.

- gesturestart, gesturechange, and gestureend
- gesturetap
- gesturehold
- contentzoom
- and more

MS gesture events

```
el.onmsgesturestart = function () {
  ...
}
```

MS gesture events

```
var MSGesture = new Gesture();
MSGesture.target = el;




el.onmsgesturestart = function () {
  ...
}
```

MS gesture events

```
var MSGesture = new Gesture();
MSGesture.target = el;
el.onmspointerdown = function (e) {
 MSGesture.addPointer(e.pointerId);
}
el.onmsgesturestart = function () {
 ...
}
```

MS gesture events

```
var MSGesture = new Gesture();
MSGesture.target = el;
el.onmspointerdown = function (e) {
  MSGesture.addPointer(e.pointerId);
}
el.onmsgesturestart = function () {
  ...
}
```

And don’t forget our old friend:

-ms-touch-action: none;

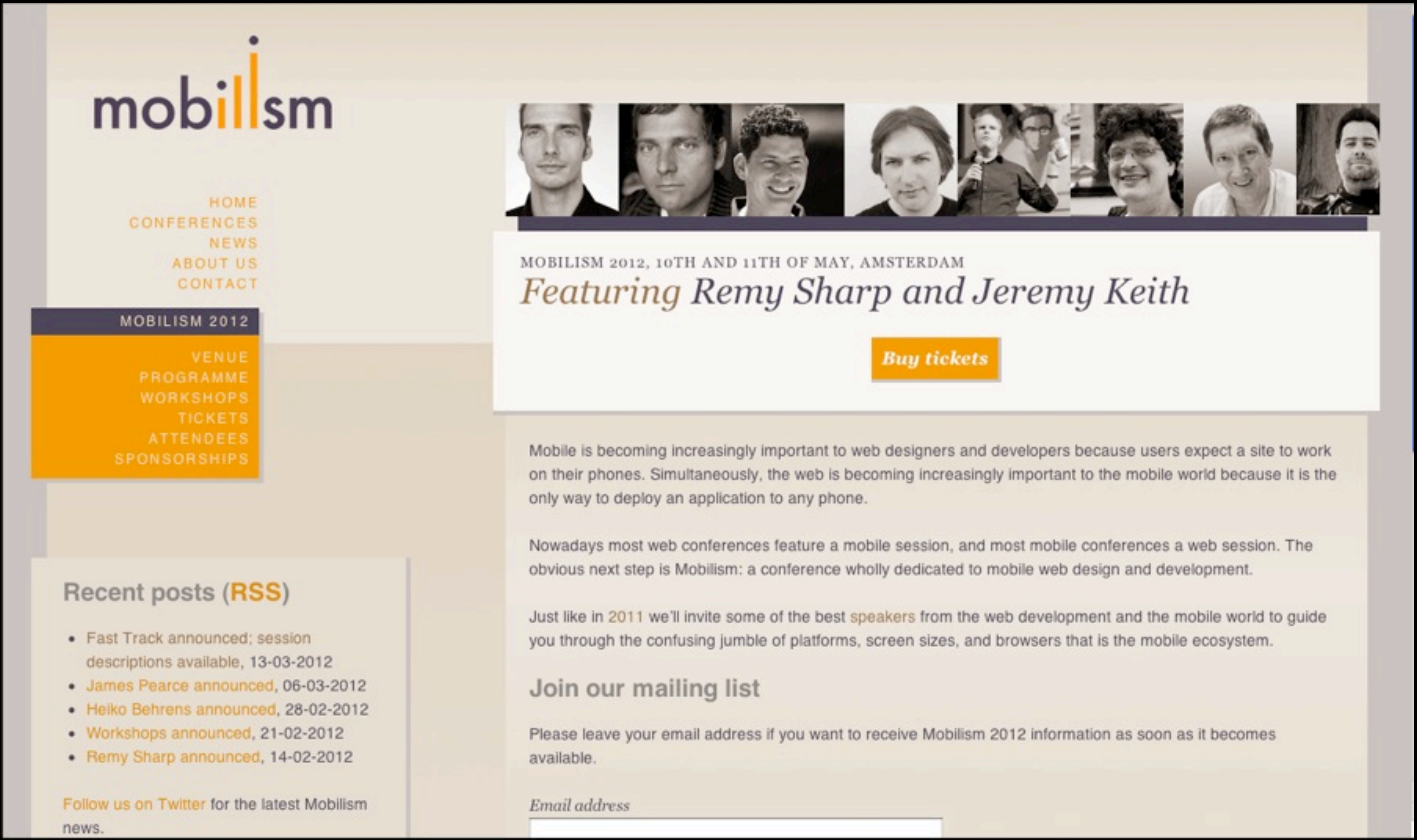
Gestures

... and even then contentzoom doesn't work

- gesturestart, gesturechange, and gestureend
- gesturetap
- gesturehold
- ~~contentzoom~~
- and more

Example

- http://quirksmode.org/touchevents
- Apple and MS Gestures
- Be sure to move out of the test element. MSGestureChange continues firing.



mobilism

HOME
CONFERENCES
NEWS
ABOUT US
CONTACT

MOBILISM 2012

VENUE
PROGRAMME
WORKSHOPS
TICKETS
ATTENDEES
SPONSORSHIPS

MOBILISM 2012, 10TH AND 11TH OF MAY, AMSTERDAM

Featuring Remy Sharp and Jeremy Keith

Buy tickets

Mobile is becoming increasingly important to web designers and developers because users expect a site to work on their phones. Simultaneously, the web is becoming increasingly important to the mobile world because it is the only way to deploy an application to any phone.

Nowadays most web conferences feature a mobile session, and most mobile conferences a web session. The obvious next step is Mobilism: a conference wholly dedicated to mobile web design and development.

Just like in 2011 we'll invite some of the best speakers from the web development and the mobile world to guide you through the confusing jumble of platforms, screen sizes, and browsers that is the mobile ecosystem.

Join our mailing list

Please leave your email address if you want to receive Mobilism 2012 information as soon as it becomes available.

Email address

Recent posts (RSS)

- Fast Track announced; session descriptions available, 13-03-2012
- James Pearce announced, 06-03-2012
- Heiko Behrens announced, 28-02-2012
- Workshops announced, 21-02-2012
- Remy Sharp announced, 14-02-2012

Follow us on Twitter for the latest Mobilism news.

Native scrolling

- I wrote the scroll script back in 2011, when there was no other way of getting the effect.
- Meanwhile there is:
- `-webkit-overflow-scrolling: touch`
- This allows one-finger native scrolling
- But only on iOS and BB10

Native scrolling

- `-webkit-overflow-scrolling: touch`
- This allows one-finger native scrolling
- But only on iOS and BB10

Native scrolling

- `-webkit-overflow-scrolling: touch`
- This allows one-finger native scrolling
- But only on iOS and BB10
- Android, Chrome, Opera 14, BB PlayBook, IE, and Firefox do not need it. They allow native scrolling by default.

Native scrolling

- `-webkit-overflow-scrolling: touch`
- This allows one-finger native scrolling
- But only on iOS and BB10
- Android, Chrome, Opera 14, BB PlayBook, IE, and Firefox do not need it. They allow native scrolling by default.
- Then why don't Apple and BlackBerry?

Native scrolling

- Giving an element native, inertial scrolling behaviour means part of the page needs independent movement.
- This is quite expensive in terms of memory and processor speed.
- So that’s why Apple and BlackBerry decided to only do it if the web developer explicitly asks for it.
- (Still, eventually people will give all their scrolling layers `-webkit-overflow-scroll: touch`, and the problem will reappear.)

Recap

- Stick with click
- Do we need separate events for every interaction mode?
- MS pointer events need -ms-touch-action
- Gesture events are usually not very useful, and are only supported by Safari and IE.
- -webkit-overflow-scrolling

Thank you

I’m going to put these slides online.

Questions?

Peter-Paul Koch
http://quirksmode.org
http://twitter.com/ppk
Mobilism, 16 and 17 May 2013