



Molecular Biomedical Informatics

分子生醫資訊實驗室

Web Programming

網際網路程式設計

Ajax

Asynchronous Javascript XML
非同步的JavaScript與XML技術

Ajax

- Ajax is a combination of multiple existing technologies
 - use HTML+CSS for expression
 - use JavaScript to operate DOM objects for dynamic effects
 - use XML for data exchange
 - use XMLHttpRequest for asynchronous connection with web server
 - use JavaScript to bind them all
- Ajax does not refer to a single technology but to organically using a series of related technologies

XML

- eXtensible Markup Language
- Content-type: text/xml\n\n





A traditional web app

Tell users to fill HTML forms and to request the server for each form. The server receives and processes the requested form and response the result page.

Innovation from existing technologies

- The above process wastes much bandwidth, since usually the result page is very similar to the request page. Namely, most HTML code are the same in the two pages.
 - in short, only very tiny part need to update
- We have such technologies for a long time. For example, we have already used JavaScript to update partial page (such as a marquee) or used XML to transfer data (but not in web page)
 - actually, if someone thought to use JavaScript to update web page according to the transferred data, he got Ajax ← the importance of idea

Ajax

Update a little
只改一點點

Killer applications

- Traditional web mails
 - <http://mail.ncku.edu.tw/>
- Modern web mails
 - <http://gmail.com/>
 - Ajax requires JavaScript, thus some kind web sites would provide a non-Ajax version that does not depend on JavaScript
 - [浅谈Gmail邮箱发展历史](#)
 - [回顾Gmail历史——猛击网页邮箱的G点！](#)
- BTW, Ajax is regarded invented in 1998 by the Outlook Web Access team of Microsoft ← the importance of idea
 - [AJAX - 维基百科](#)

Other Google applications

- [Google](#)
- [Google Calendar](#)
- [Google Docs](#)
- [Google Maps](#)
- The so-called rich interface application (RIA). Since each time only a tiny part is updated, the content could be very complicated. The entire page wouldn't be reloaded.
 - some are too rich to provide a non-Ajax version

Common Ajax-dependent components

- Auto complete (自動完成)
 - [Ajax Autocomplete for jQuery](#)
 - [FCBKcomplete](#)
 - [ajax autocomplete - Google 搜尋](#)
- Tooltip (工具提示)
 - [40+ Tooltips Scripts With AJAX, JavaScript & CSS](#)
 - [tooltip - Google 搜尋](#)
- Upload (上傳)
 - <http://valums.com/ajax-upload/>
 - [upload - Google 搜尋](#)
- Human is slow. Leak a partial content for the users to read (or let them to input something) first. The response time of human is very enough for machines to do the actual work. Don't waste such time.

A simple Ajax example

■ Design logic

- users fill a HTML form and submit it
- after submitting, the client does not wait the response of the server and the control returns to the users immediately ← this behavior is the so-called asynchronous (非同步)
- change the content to ‘loading’, which makes the users comfortable
- after receiving the server response, display the results

The HTML

```
<body>
```

```
  <input name="id" type="text" />
```

```
  <button type="submit">Go</button>
```

```
  <div id="content">
```

```
    initial content
```

```
  </div>
```

```
</body>
```

The design of HTML form should follow the conventions of the non-Ajax version, in case that you need a non-Ajax one

Usually you need to set the `id` attribute of the DOM objects for manipulating them easily

The JavaScript

```
jQuery(document).ready(function() {
  jQuery('button[type=submit]').click(function() {
    jQuery.ajax({
      data: {
        id: jQuery('#content').text()
      },
      url: '...',
      success: function(data) {
        jQuery('#content').text(data);
      }
    });
    jQuery('#content').html('loading...'); // (B)
  });
});
```

The handler after that the document
An event to activate the Ajax. Here the handler
after clicking the button ('click' event) is used
to involve the Ajax. There are many Ajax functions
such as `$.get()`, `$.getJSON()`, `$.getScript()`,
got from `<input>` with name attribute, just as the
Asynchronous is here! If you know how the code of
new Ajax version. But there might be manipulations.
The handler (A) and (B) are executed, you understand Ajax. After
Update according to `ajax()`, two asynchronous program flows appear.
the response is used as plain text. It can be used as HTML with `.html()`
or more complex structures. The handshaking is now our business.
Make users comfortable. Here a loading message is
displayed in `#content`. It could be more beautiful, see
<http://www.ajaxload.info/> and <http://www.preloaders.net/>.

Notes

- Follow the conventions of the non-Ajax version
- Usually you need a DOM object to for output
- An event to activate the Ajax
- Invoke the Ajax
 - pack the data (by ourselves, there might be manipulations)
 - <http://api.jquery.com/category/ajax/>
- After Ajax, you got two asynchronous program flows
 - after submitting, display messages to make users comfortable
 - after server response, display the results by ourselves



Any Questions?

about Ajax

Today's assignment

今天的任務

Make your site more fluent

- Make your existing CGI functions to the Ajax version so that no page reload after users' requests. If appropriate messages are provided, users would feel that all operations are immediate.
- Reference
 - [Ajax – jQuery API](#)
 - [Ajaxload - Ajax loading gif generator](#)
 - [Preloaders.net - AJAX loading GIF and APNG spinners, bars and 3D animations generator](#)
 - [5 Ways to Make Ajax Calls with jQuery](#)
- Your web site (<http://merry.ee.ncku.edu.tw/~xxx/cur/>, ex5) will be checked not before 23:59 11/6 (Tue). You may send a report (such as some important modifications) to [me](#) in case I did not notice your features.