

Lab #2: Webpage Design

Objective:

1. Write a simple sets of web pages.
2. Build the web server to host the web pages.

Equipment:

- Computer: a generic computer with Windows system (Win 7 or Win 10) installed
- IP camera: Panasonic BL-C111
- Router: Netgear AC1000 Wi-Fi router

Safety Rules:

1. Turn off power supply BEFORE disconnecting power line.
2. Don't touch any power source when your hands are wet.

Step 1: Web server installation

1. Download and install “xampp-win32-7.2.6-0-VC15-installer.exe” [1] and all its components.
2. Open XAMPP's control panel:

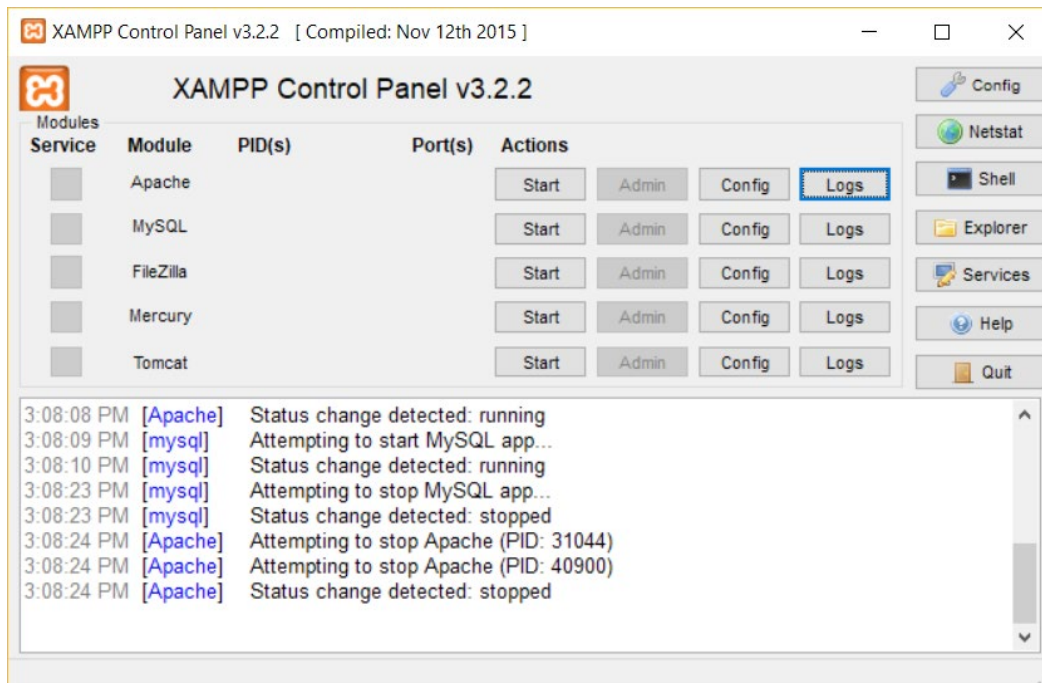


Figure 1 XAMPP Control Panel

3. Modify the config of PHP by clicking the top “config” button (in “Apache” line), then choose “PHP (php.ini)”. Add a line: `extension=odbc` at any place.
4. Click the top “Start” (in “Apache” line) to start the HTTP server. Visit <http://localhost/dashboard/> to make sure it works correctly.

Step 2: Writing webpage for camera video

The webpage is written using HTML and PHP language. HTML is used to build static content of the webpage, while PHP is used to handle requests, and to generate dynamic content. To make web page writing easier, a few libraries are used to help with our goal.

1. Copy the folder “counter” to the folder C:\xampp\htdocs.
2. To show the video captured from the camera, use an `` tag with the following address (replace the IP with the camera’s):

```
</im
g>
<p>If video doesn't show, click <a
href="http://admin123:admin321@192.168.1.253/CgiUserLogin"
target="_blank">here</a> to re-login the camera.</p>
```

3. Copy all the lines above and put it into a text file and save it as `_video.php` in counter folder.
4. Visit http://localhost/counter/_video.php and see if you can see the camera video. Make sure to click the “login” link below first then go back and refresh.

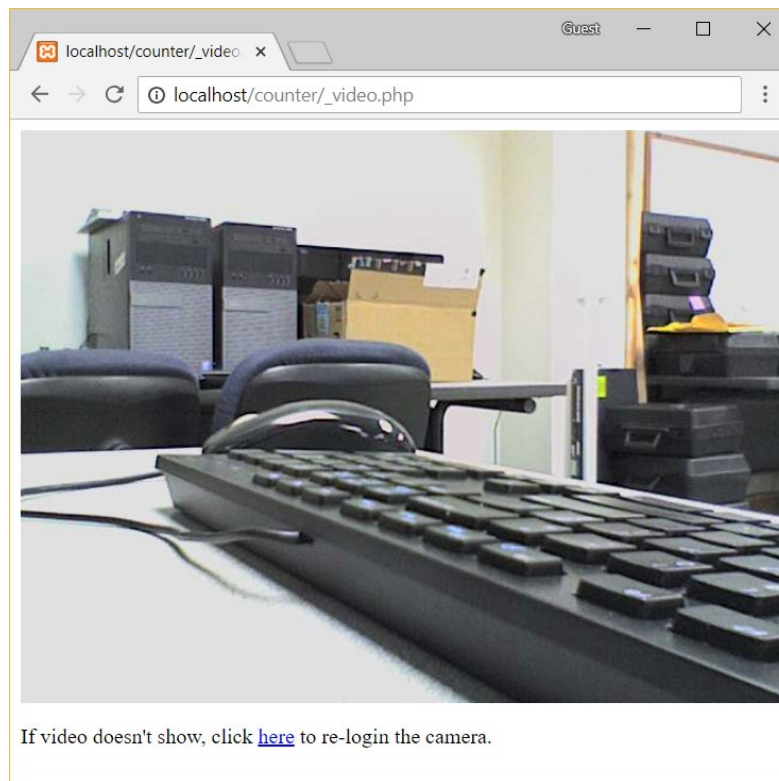


Figure 2 Video webpage result

Step 3: writing a frame to incorporate the manual control and video

1. Copy the following content to construct the page for manual control and save it as `_control.php`:

```
<?php
include 'connect_db.php';
checkLoggedIn(basename(__FILE__));
```

```
?>

<!DOCTYPE html>
<html>

<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1,
shrink-to-fit=no">
  <meta name="description" content="">
  <meta name="author" content="">
  <link rel="icon" href="images/favicon.ico">
  <link rel="stylesheet" href="css/main.css" />
  <link rel="stylesheet" href="css/bootstrap.css">
  <script src="js/jquery-3.2.1.js"></script>
  <script src="js/popper.min.js"></script>
  <script src="js/bootstrap.min.js"></script>
</head>

<body>

  <div>
    <!-- Insert _video.php here -->

    <!-- Insert _video.php above -->

    <h1 class="display-4" style="display:inline-block;vertical-
align:middle;">Manual Mode</h1>

    <div class="btn-group" data-toggle="buttons">
      <button class="btn btn-primary btn-lg" onclick="connect()">
        <input type="radio" name="options" id="option1"
autocomplete="on" onclick="connect()"> Connect &raquo;
      </button>
      <label class="btn btn-primary btn-lg" onclick="disconnect()">
        <input type="radio" name="options" id="option2"
autocomplete="off"> Disconnect &raquo;
      </label>
      <label class="btn btn-primary btn-lg" onclick="exit()">
        <input type="radio" name="options" id="option3"
autocomplete="off"> Exit &raquo;
      </label>
    </div>

    <div id="did">
      
      
    </div>

    
    
    <div id="left">
```

```

        <div id="control_img1">
            
            <button type="button" onclick="x_y_0_1()"
id="x_y_0_1"></button>
            <button type="button" onclick="x_y_1_0()"
id="x_y_1_0"></button>
            <button type="button" onclick="x_y_10_0()"
id="x_y_10_0"></button>
            <button type="button" onclick="x_y_100_0()"
id="x_y_100_0"></button>
            <button type="button" onclick="x_m()" id="x_m"></button>
            <button type="button" onclick="x_p()" id="x_p"></button>
            <button type="button" onclick="y_m()" id="y_m"></button>
            <button type="button" onclick="y_p()" id="y_p"></button>
        </div>
        <div id="control_img2">
            <button type="button" onclick="z_0_1()" id="z_0_1"></button>
            <button type="button" onclick="z_1_0()" id="z_1_0"></button>
            <button type="button" onclick="z_10_0()"
id="z_10_0"></button>

            <button type="button" onclick="z_p()" id="z_p"></button>
            <button type="button" onclick="z_m()" id="z_m"></button>
            
        </div>
    </div>
</div>

<script type="text/javascript">
    var step = 1;
    var step_ = 1;
    var mid = document.getElementById("mid");
    var mid_ = document.getElementById("z2");
    window.document.onkeydown = function (ent) {
        var event = ent || window.event;
        switch (event.keyCode) {
            case 37: //left
                mid.style.left = Math.max(0, mid.offsetLeft - step) +
"px";
                break;
            case 38: //up
                mid.style.top = Math.max(0, mid.offsetTop - step) + "px";
                break;
            case 39: //right
                mid.style.left = Math.min(580, mid.offsetLeft + step) +
"px";
                break;
            case 40: //down
                mid.style.top = Math.min(580, mid.offsetTop + step) +
"px";
                break;

```

```
    }  
  }  
  
  function sleep(numberMillis) {  
    var now = new Date();  
    var exitTime = now.getTime() + numberMillis;  
    while (true) {  
      now = new Date();  
      if (now.getTime() > exitTime)  
        return;  
    }  
  }  
  
  function sethome() {  
    sleep(1000);  
    command('G28 X0 Y0 Z0')  
  }  
  
  function drawmode() {  
    window.open('3dprinter_linemode.php', 'Draw Mode',  
      'height=700, width=1050, top=0, left=0, toolbar=no,  
menubar=no, scrollbars=no, resizable=no,location=no, status=no'  
    )  
  }  
  
  function lettermode() {  
    window.open('3dprinter_lettermode.php', 'Letter Mode',  
      'height=700, width=1050, top=0, left=0, toolbar=no,  
menubar=no, scrollbars=no, resizable=no,location=no, status=no'  
    )  
  }  
  
  function disconnect() {  
    sleep(1000);  
    command('disconnect');  
  }  
  
  function command(cmd, cb) {  
    $.get('command.php', {  
      command: cmd  
    }, function (data) {  
      if (data == 0) {  
        cb && cb()  
      }  
    })  
  }  
  
  function exit() {  
    $.get('exit.php', function () {  
      window.location.href = 'lab_index.php';  
    });  
  }  
}
```

```
}

function connect() {
    command('connect')
    sleep(4000)
    command('G28 X0 Y0 Z0')
    alert('Connected and initialized successfully!')
}

function x_y_0_1() {
    step = 0.1;
}

function x_y_1_0() {
    step = 1;
}

function x_y_10_0() {
    step = 10;
}

function x_y_100_0() {
    step = 100;
}

function x_m() // x-
{
    console.log(mid.offsetLeft - step)
    if (mid.offsetLeft - step <= -100) return;
    sleep(1000)
    command('move x -' + step, function () {
        mid.style.left = Math.max(-6, mid.offsetLeft - step) + "px";
    });
}

function x_p() // x+
{
    if (mid.offsetLeft + step >= 594) return;
    sleep(1000)
    command('move x ' + step, function () {
        mid.style.left = Math.min(594, mid.offsetLeft + step) + "px";
    });
}

function y_m() // y+
{
    if (mid.offsetTop - step <= -100) return;
    sleep(1000)
    command('move y ' + step, function () {
        mid.style.top = Math.max(-6, mid.offsetTop - step) + "px";
    });
}
```

```
function y_p() // y-
{
    if (mid.offsetTop + step >= 594) return;
    sleep(1000)
    command('move y -' + step, function () {
        mid.style.top = Math.min(594, mid.offsetTop + step) + "px";
    });
}

function z_p() // z-
{
    if (mid_.offsetTop + step_ >= 550) return;
    sleep(1000)
    command('move z -' + step_, function () {
        mid_.style.top = Math.min(900, mid_.offsetTop + step_) +
"px";
    });
}

function z_m() // z+
{
    if (mid_.offsetTop - step_ <= 110) return;
    sleep(1000)
    command('move z +' + step_, function () {
        mid_.style.top = Math.max(110, mid_.offsetTop - step_) +
"px";
    });
}

function z_0_1() {
    step_ = 0.1;
}

function z_1_0() {
    step_ = 1;
}

function z_10_0() {
    step_ = 10;
}
var maxTime = 600; // seconds
var time = maxTime;
$('body').on('mousemove mousedown', function (e) {
    time = maxTime; // reset
});
var intervalId = setInterval(function () {
    time--;
    if (time <= 0) {
        ShowInvalidLoginMessage();
        //clearInterval(intervalId);
    }
}
```

```
    }, 1000)

    function ShowInvalidLoginMessage() {
        var logout = window.confirm(
            "We detected that you have not operated for 10 minutes. Do
you want to log out?(You will log out in 10 seconds)"
        );
        if (logout) {
            clearInterval(intervalId);
            top.location = 'logout.php';
        } else {
            time = maxTime;
            //location.reload();
        }
    }
</script>

</body>

</html>
```

2. Visit http://localhost/counter/_control.php to see the manual control panel web page. However, it lacks video camera monitoring functionality.
3. By combining two pages together, we can control and monitor the 3D printer remotely at the same time. Modify the file by adding the following line inside the outer `<div>` (at the hinted location):

```
<div style="width: 200px;position: absolute;left:550px;top:200px;">
    <?php include "_video.php"; ?>
</div>
```

This includes the `_video.php` page we created before into this page to show the video.

4. Visit http://localhost/counter/_control.php again and see the difference. The users now can see the video and the control panel at the same place.

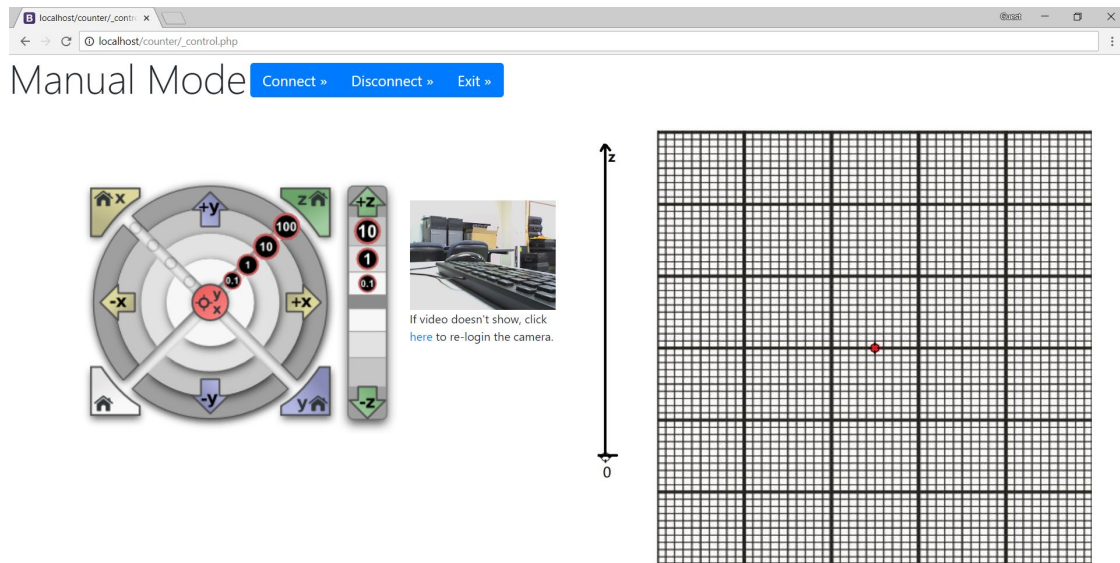


Figure 3 Final result of the combined webpage

Download links

[1] <https://www.apachefriends.org/xampp-files/7.2.6/xampp-win32-7.2.6-0-VC15-installer.exe>