树莓派驱动低成本双目VR摄像头

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闲鱼觅得一款低价的双目VR摄像头，如图，该摄像头的输出图像格式是yuyv格式

官方的上位机如图，只能在windows下使用，USB口插入摄像头可以读取到单目图像、VR图像和双目图像，下面有4个切换模式的按键

该摄像头支持UVC协议，在linux下默认只能读取单目的图像，因此需要模拟上位机的切换模式按键给双目摄像头发送数据。
树莓派中可以通过uvcdynctrl命令给发送数据来切换摄像头的模式。

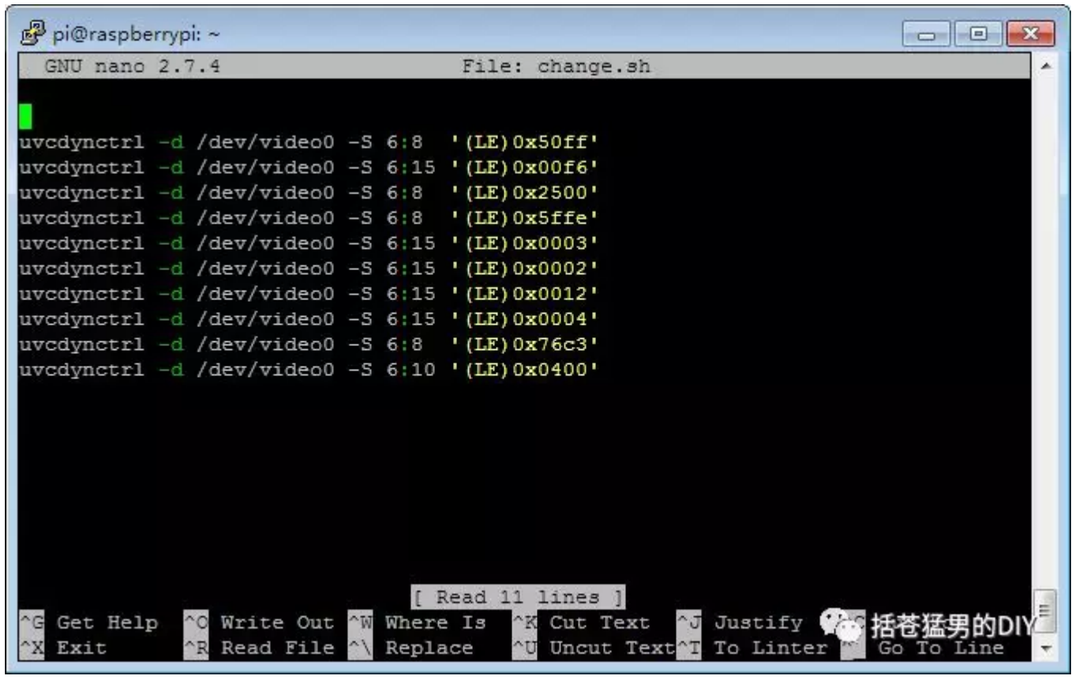
树莓派中需要安装uvcdynctrl，执行如下命令
sudo apt-get install uvcdynctrl

安装完成后并把uvcdynctrl命令写成shell脚本来实现四个模式的切换。切换成双目模式的脚本内容如下,video0为摄像头，可根据实际改动。最后一行中用0x0100,0x0200,0x0300,0x0400指令分别可以切换到左单目，右单目，红蓝模式，双目模式。

```
uvcdynctrl -d /dev/video0 -S 6:8  '(LE)0x50ff'
uvcdynctrl -d /dev/video0 -S 6:15 '(LE)0x00f6'
uvcdynctrl -d /dev/video0 -S 6:8  '(LE)0x2500'
uvcdynctrl -d /dev/video0 -S 6:8  '(LE)0x5ffe'
```

```
uvcdynctrl -d /dev/video0 -S 6:15 '(LE)0x0003'
uvcdynctrl -d /dev/video0 -S 6:15 '(LE)0x0002'
uvcdynctrl -d /dev/video0 -S 6:15 '(LE)0x0012'
uvcdynctrl -d /dev/video0 -S 6:15 '(LE)0x0004'
uvcdynctrl -d /dev/video0 -S 6:8  '(LE)0x76c3'
uvcdynctrl -d /dev/video0 -S 6:10 '(LE)0x0400'
```

树莓派新建 change.sh
文件命令行输入 nano change.sh，内容如下图



修改文件权限，增加可执行权限
chmod+x change.sh
执行脚本
./change.sh

运行后如下图

```
pi@raspberrypi:~ $ ./change.sh
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0xffff  (BE)0xffff
query step size of    : (LE)0x0100  (BE)0x0001
set value of          : (LE)0x50ff  (BE)0xff50
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0x0000  (BE)0x0000
query step size of    : (LE)0x0100  (BE)0x0001
set value of          : (LE)0x00f6  (BE)0xf600
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0xffff  (BE)0xffff
query step size of    : (LE)0x0100  (BE)0x0001
set value of          : (LE)0x2500  (BE)0x0025
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0xffff  (BE)0xffff
query step size of    : (LE)0x0100  (BE)0x0001
set value of          : (LE)0x5ffe  (BE)0xfe5f
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0x0000  (BE)0x0000
query step size of    : (LE)0x0100  (BE)0x0001
set value of          : (LE)0x0003  (BE)0x0300
query control size of : 2
query control flags of: 0x3
query minimum value of: (LE)0x0000  (BE)0x0000
query maximum value of: (LE)0xffff  (BE)0xffff
query default value of: (LE)0x0000  (BE)0x0000
query step size of    : (LE)0x0100  (BE)0x0001
```


至此，已经完成了通过脚本切换摄像头的四种模式。

下面介绍通过mjpg-streamer视频服务器采集摄像头图像，并通过Chrome浏览器采集摄像头图像

1.下载开源mjpg-streamer代码
git clone https://github.com/codewithpassion/mjpg-streamer.git

2.安装mjpg-streamer
进入子目录

cd /mjpg-streamer-experimental

编译安装

make all

sudo make install

步骤截图如下

```
pi@raspberrypi:~/test/mjpg-streamer/mjpg-streamer-experimental $ make all
gcc -D'SVN_REV="Unversioned directory"' -DLINUX -D_GNU_SOURCE -Wall  -g -Wuninitialized   -c -o mjpg_streamer.o mjpg_streamer.c
mjpg_streamer.c: In function 'signal_handler':
mjpg_streamer.c:95:12: warning: unused variable 'j' [-Wunused-variable]
     int i, j;
            ^
gcc -D'SVN_REV="Unversioned directory"' -DLINUX -D_GNU_SOURCE -Wall  -g -Wuninitialized   -c -o utils.o utils.c
gcc -D'SVN_REV="Unversioned directory"' -DLINUX -D_GNU_SOURCE -Wall  -g -Wuninitialized mjpg_streamer.o utils.o -lpthread -ldl -o mjpg_strea
mer
chmod 755 mjpg_streamer
make -C plugins/input_uvc all
make[1]: Entering directory '/home/pi/test/mjpg-streamer/mjpg-streamer-experimental/plugins/input_uvc'
gcc -c -O1  -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -o v4l2uvc.lo v4l2uvc.c
gcc -c -O1  -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -o jpeg_utils.lo jpeg_utils.c
gcc -c -O1  -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -o dynctrl.lo dynctrl.c
gcc -O1  -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -o input_uvc.so input_uvc.c v4l2uvc.lo jpeg_utils.lo dynctrl.lo -ljpeg
make[1]: Leaving directory '/home/pi/test/mjpg-streamer/mjpg-streamer-experimental/plugins/input_uvc'
cp plugins/input_uvc/input_uvc.so .
make -C plugins/output_http all
make[1]: Entering directory '/home/pi/test/mjpg-streamer/mjpg-streamer-experimental/plugins/output_http'
gcc -c -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -Wuninitialized -o httpd.lo httpd.c
gcc -DLINUX -D_GNU_SOURCE -Wall -shared -fPIC -Wuninitialized -o output_http.so output_http.c httpd.lo
make[1]: Leaving directory '/home/pi/test/mjpg-streamer/mjpg-streamer-experimental/plugins/output_http'
cp plugins/output_http/output_http.so .
pi@raspberrypi:~/test/mjpg-streamer/mjpg-streamer-experimental $ sudo make install
install --mode=755 mjpg_streamer /usr/local/bin
install --mode=644 input_uvc.so output_http.so /usr/local/lib/
install --mode=755 -d /usr/local/www
install --mode=644 -D www/* /usr/local/www
```


3 .运行mjpg-streamer

./mjpg_streamer -i "./input_uvc.so -y" -o "./output_http.so -w ./www"

```
pi@raspberrypi:~/test/mjpg-streamer/mjpg-streamer-experimental $ ./mjpg_streamer -i "./input_uvc.so -y" -o "./output_http.so -w ./www"
MJPG Streamer Version: svn rev: Unversioned directory
 i: Using V4L2 device.: /dev/video0
 i: Desired Resolution: 640 x 480
 i: Frames Per Second.: -1
 i: Format............: YUYV
 i: JPEG Quality......: 80
 i: TV-Norm...........: DEFAULT
UVCIOC_CTRL_ADD - Error at Pan (relative): Inappropriate ioctl for device (25)
UVCIOC_CTRL_ADD - Error at Tilt (relative): Inappropriate ioctl for device (25)
UVCIOC_CTRL_ADD - Error at Pan Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_ADD - Error at Tilt Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_ADD - Error at Pan/tilt Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_ADD - Error at Focus (absolute): Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Pan (relative): Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Tilt (relative): Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Pan Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Tilt Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Pan/tilt Reset: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Focus (absolute): Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at LED1 Mode: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at LED1 Frequency: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Disable video processing: Inappropriate ioctl for device (25)
UVCIOC_CTRL_MAP - Error at Raw bits per pixel: Inappropriate ioctl for device (25)
 o: www-folder-path...: ./www/
 o: HTTP TCP port.....: 8080
 o: username:password.: disabled
 o: commands..........: enabled
```

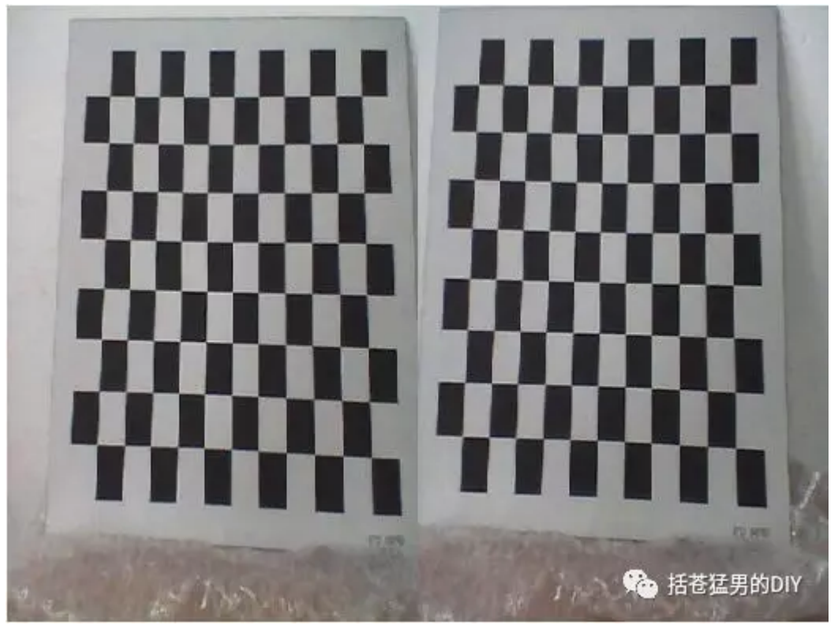

注意：有些修改版的mjpg-streamer无法读取yuyv格式，即-y参数无法使用，该摄像头的输出图像格式是yuyv格式。

使用谷歌浏览器访问

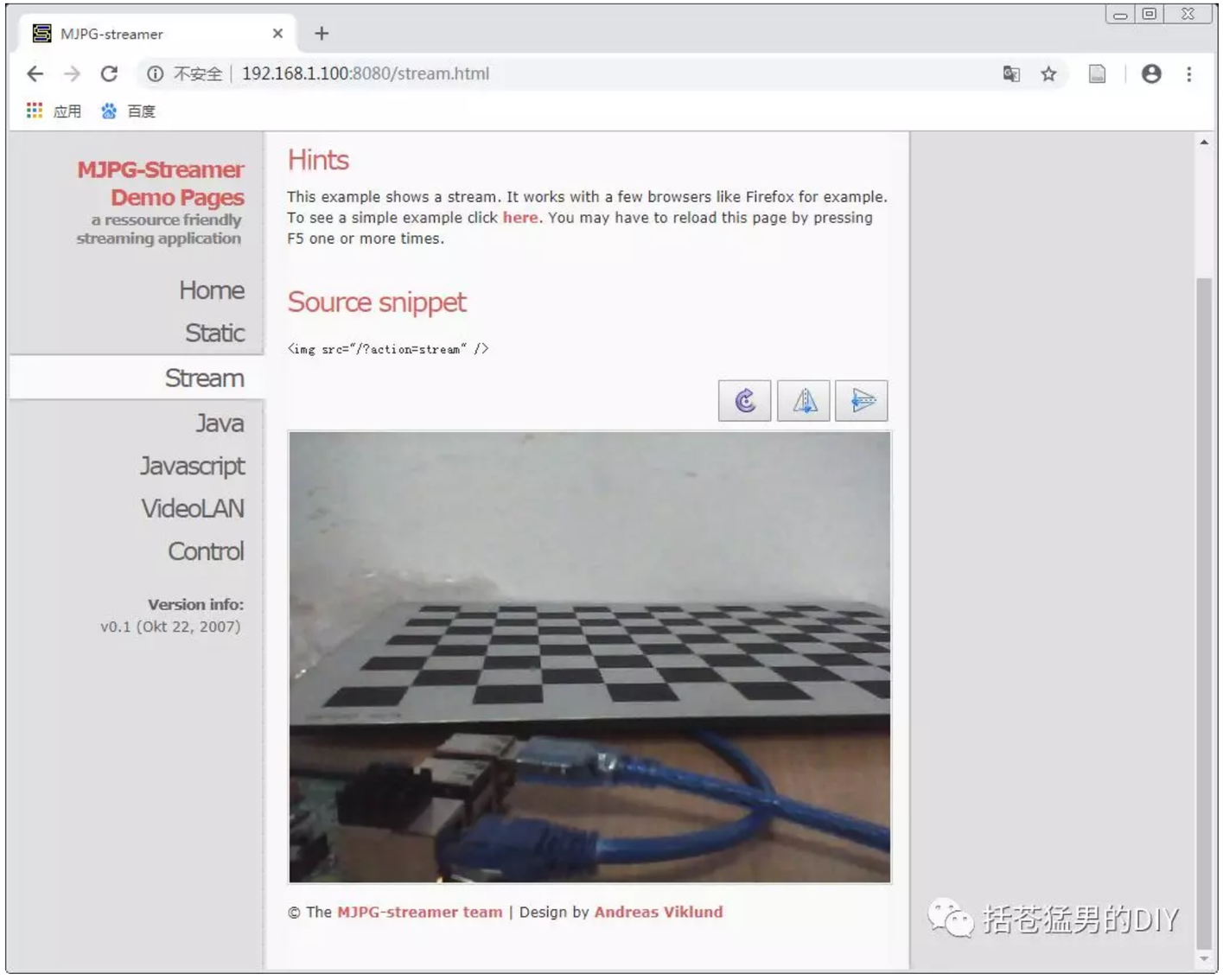
输入 http://192.168.1.100:8080 可以看到视频

192.168.1.100 为我的树莓派局域网内IP地址，改成你自己的即可

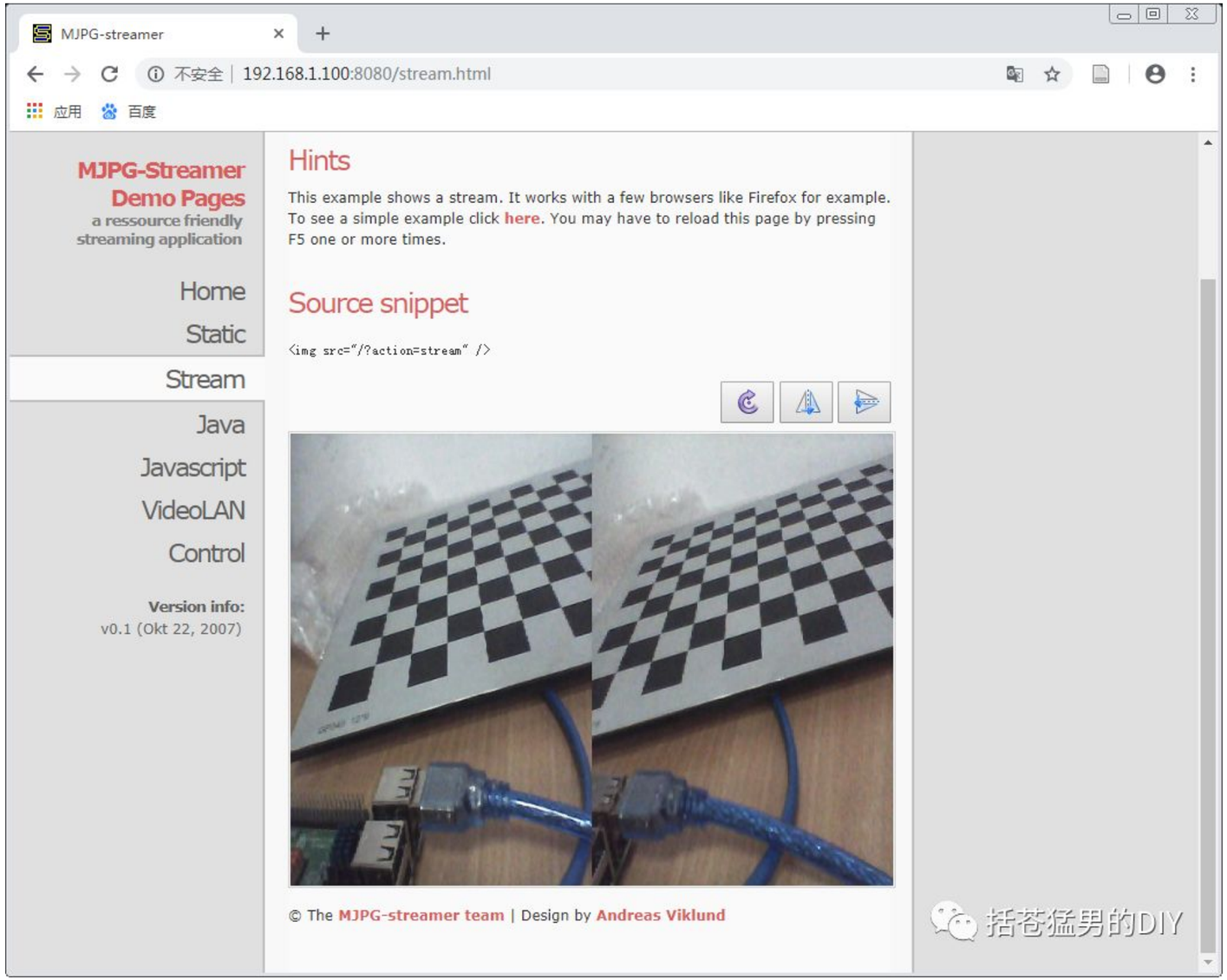
效果如图像素为320*240，是对左右相机的图像进行了压缩的结果。原左右相机图像为320*240



单目效果如下



通过脚本切换到双目效果如下


MJPG-streamer
不安全 | 192.168.1.100:8080/stream.html
应用
百度
MJPG-Streamer Demo Pages
a ressource friendly streaming application
Home
Static
Stream
Java
Javascript
VideoLAN
Control
Version info:
v0.1 (Okt 22, 2007)
Hints
This example shows a stream. It works with a few browsers like Firefox for example. To see a simple example click here. You may have to reload this page by pressing F5 one or more times.
Source snippet

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括苍猛男的DIY

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