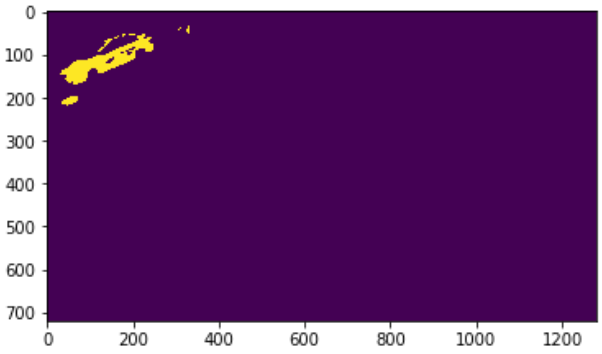
In [2]:
```
import sys
print(sys.executable)
from jupyter_core.paths import jupyter_data_dir
import cv2
import numpy as np
import matplotlib.pyplot as plt
```

```
/usr/bin/python3
```

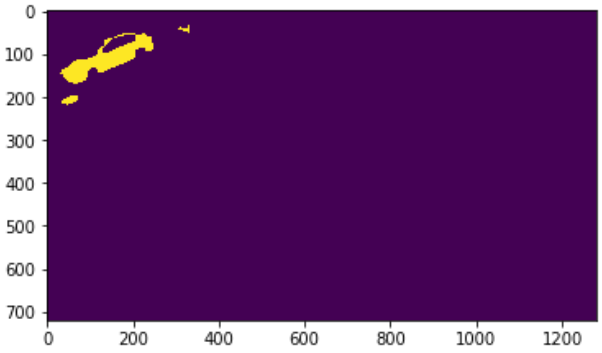
In [85]:
```
img = np.array(cv2.imread("/home/dongqxia/projects/bgsubtraction/submission/test/365.png", 0))
plt.imshow(img)
print(np.shape(img))
```

```
(720, 1280)
```



In [86]:
```
kernel = np.ones((11,11),np.uint8)
opening = cv2.morphologyEx(img, cv2.MORPH_CLOSE, kernel)

plt.imshow(opening)
```

Out[86]:
```
<matplotlib.image.AxesImage at 0x7f8da7fccb38>
```

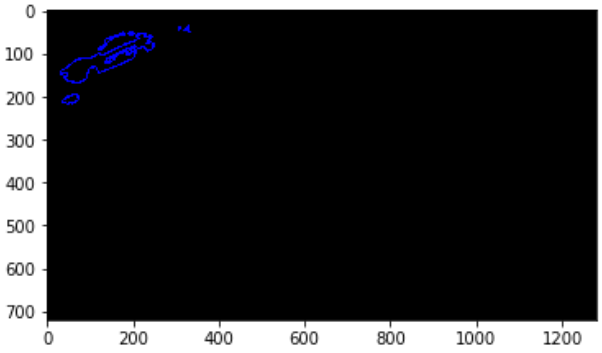


In [90]:
```
new_img, contours, hir = cv2.findContours(img, cv2.RETR_TREE, cv2.CHAIN_APPROX_
SIMPLE)
print(contours)
new_img = np.zeros((np.shape(opening)[0], np.shape(opening)[1], 3))
cv2.drawContours(new_img, contours, -1,(0,0,255), 3)
plt.imshow(new_img)
```

```
Clipping input data to the valid range for imshow with RGB data ([0..1] for flo
ats or [0..255] for integers).
```

```
[array([[[ 67, 196]],

       [[ 66, 197]],

       [[ 61, 197]],

       [[ 60, 198]],

       [[ 57, 198]],

       [[ 56, 199]],

       [[ 55, 199]],

       [[ 54, 200]],

       [[ 53, 200]],

       [[ 52, 201]],

       [[ 50, 201]],

       [[ 49, 202]],

       [[ 46, 202]],

       [[ 46, 203]],

       [[ 44, 205]],

       [[ 43, 205]],

       [[ 42, 206]],

       [[ 41, 206]],

       [[ 40, 207]],

       [[ 40, 208]],

       [[ 37, 211]],

       [[ 36, 211]],

       [[ 34, 213]],

       [[ 34, 214]],

       [[ 35, 215]],

       [[ 38, 215]],

       [[ 39, 216]],

       [[ 44, 216]],

       [[ 45, 217]],

       [[ 46, 217]],

       [[ 47, 218]],

       [[ 47, 219]],
```

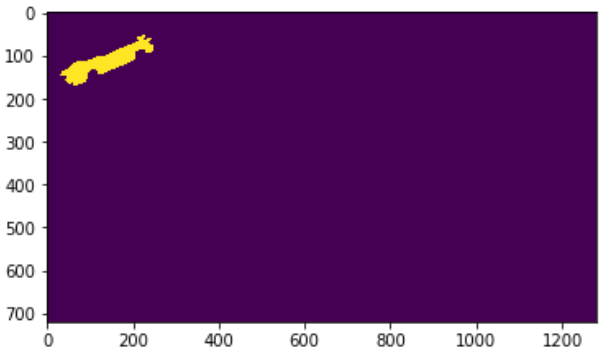
Out[90]: <matplotlib.image.AxesImage at 0x7f8da7e50ef0>



In [97]:
```
new_img1 = np.zeros((np.shape(opening)[0], np.shape(opening)[1]))
for cnt in contours:
    (x,y),r = cv2.minEnclosingCircle(cnt)
    area = cv2.contourArea(cnt)
    if area > 1000 and area/(3.1415926*r*r) > 0.1:
        print(x, y, area)
        print(area/(3.1415926*r*r))
        cv2.fillPoly(new_img1, pts =[cnt], color=(255, 255, 255))

plt.imshow(new_img1)
```

```
138.0 104.0 7706.0
0.1844556896465044
```

Out[97]: <matplotlib.image.AxesImage at 0x7f8da644e8d0>



In [94]:
```
init_img = cv2.imread("/home/dongqxia/projects/bgsubtraction/submission/test/init_365.png")
plt.imshow(init_img)
```

Out[94]: <matplotlib.image.AxesImage at 0x7f8da6506160>

In [105]:
```
init_img[new_img1==255, :] = (255, 0, 0)
plt.imshow(init_img)
```

Out[105]: <matplotlib.image.AxesImage at 0x7f8da643a748>