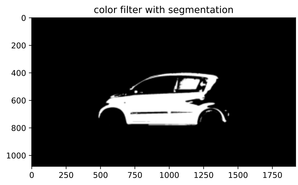
Vermessung der Autolänge

Importierung und Aufbereiten der Bilder

In [11]:
```
import matplotlib.pyplot as plt
import numpy as np
import cv2
# Import Opel zur Skalierung

#color filter with segmentation

img = cv2.imread('test.jpg')

blur = cv2.blur(img,(5,5))
blur0=cv2.medianBlur(blur,5)
blur1= cv2.GaussianBlur(blur0,(5,5),0)
blur2= cv2.bilateralFilter(blur1,9,75,75)

hsv = cv2.cvtColor(blur2, cv2.COLOR_BGR2HSV)

low = np.array([60, 40, 50])
high = np.array([255, 255, 255])
mask = cv2.inRange(hsv, low, high)

res = cv2.bitwise_and(img,img, mask= mask)

gray = cv2.cvtColor(res, cv2.COLOR_BGR2GRAY)

_, img_thresh = cv2.threshold(gray, 50, 255, cv2.THRESH_BINARY)

plt.imshow(img_thresh, cmap = 'gray')
plt.title('color filter with segmentation')
```

Out[11]:
```
Text(0.5, 1.0, 'color filter with segmentation')
```



Skalierung des Bilds

In [12]:
```
img_cutted = img_thresh[200:1000, 150:1750]
```

Äußerste weißen Punkte im Array finden

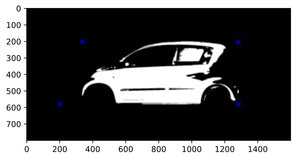
In [13]:
```
indexes = np.where(img_cutted>0)

min_y_opel = min(indexes[0])
max_y_opel = max(indexes[0])

min_x_opel = min(indexes[1])
max_x_opel = max(indexes[1])


print('The minimum x coordinate is', min_x_opel)
print('The maximum x coordinate is', max_x_opel)
print('The minimum y coordinate is', min_y_opel)
print('The maximum y coordinate is', max_y_opel)
```

```
The minimum x coordinate is 336
The maximum x coordinate is 1283
The minimum y coordinate is 202
The maximum y coordinate is 581
```

Überprüfung der Werte

In [62]:
```
plt.imshow(img_cutted, cmap = 'gray')
plt.plot(min_x_opel, min_y_opel, 'bx')
plt.plot(min_y_opel, max_y_opel, 'bx')
plt.plot(max_x_opel, min_y_opel, 'bx')
plt.plot(max_x_opel, max_y_opel, 'bx')
```

Out[62]:
```
[<matplotlib.lines.Line2D at 0x7f8fd5620250>]
```



Länge und Höhe Berechnen

In [18]:
```
height_px2 = max_y_opel - min_y_opel
width_px2 = max_x_opel - min_x_opel
```

In [66]:
```
height_px2, width_px2
```

Out[66]:
```
(379, 947)
```

Pixel-in-Milimeter-Faktor ermitteln

Reale Länge des Blauen Auto sind 3630 mm

Reale Höhe des Blauen Auto sind 1550 mm

In [34]:
```
Faktor_Länge= 3630/947
```

In [27]:
```
Faktor
```

Out[27]:
```
3.833157338965153
```

In [35]:
```
Faktor_Höhe= 1550/379
```

In [36]:
```
Faktor_Höhe
```

Out[36]:
```
4.089709762532982
```

Funktion erstellen

In [57]:
```
import matplotlib.pyplot as plt
import numpy as np
import cv2
# Import Opel zur Skalierung

#color filter with segmentation

img = cv2.imread('test.jpg')

blur = cv2.blur(img,(5,5))
blur0=cv2.medianBlur(blur,5)
blur1= cv2.GaussianBlur(blur0,(5,5),0)
blur2= cv2.bilateralFilter(blur1,9,75,75)

hsv = cv2.cvtColor(blur2, cv2.COLOR_BGR2HSV)

low = np.array([60, 40, 50])
high = np.array([255, 255, 255])
mask = cv2.inRange(hsv, low, high)

res = cv2.bitwise_and(img,img, mask= mask)

gray = cv2.cvtColor(res, cv2.COLOR_BGR2GRAY)

_, img_thresh = cv2.threshold(gray, 50, 255, cv2.THRESH_BINARY)

Werte_Auto= Vermessung(img_thresh)

def Vermessung(x):

    #Array übergeben und in img variable einfügen
    img=x
    img_copy = img[200:1000, 250:1600]       #Bild Scalieren


    indexes = np.where(img_copy>0)         #minimales und maximale Punkte finden

    min_y = min(indexes[0])
    max_y = max(indexes[0])

    min_x = min(indexes[1])
    max_x = max(indexes[1])

    height_pi = max_y - min_y           #Länge und Höhe in Pixel berechnen
    width_pi = max_x - min_x

    Länge = width_pi*(3.8)                #Länge und Höhe von Pixel in mm berechnen
    Höhe = height_pi*(4)


    return(Länge, Höhe)
```

In [58]:
```
Werte_Auto
```

Out[58]:
```
(3598.6, 1516)
```

Finaler Testlauf

In [61]:
```
import matplotlib.pyplot as plt
import numpy as np
import cv2
# Import Opel zur Skalierung

#color filter with segmentation

img = cv2.imread('bus.jpg')

blur = cv2.blur(img,(5,5))
blur0=cv2.medianBlur(blur,5)
blur1= cv2.GaussianBlur(blur0,(5,5),0)
blur2= cv2.bilateralFilter(blur1,9,75,75)

hsv = cv2.cvtColor(blur2, cv2.COLOR_BGR2HSV)

low = np.array([60, 40, 50])
high = np.array([255, 255, 255])
mask = cv2.inRange(hsv, low, high)

res = cv2.bitwise_and(img,img, mask= mask)

gray = cv2.cvtColor(res, cv2.COLOR_BGR2GRAY)

_, img_thresh = cv2.threshold(gray, 50, 255, cv2.THRESH_BINARY)

Werte_Auto= Vermessung(img_thresh)

Werte_Auto
```

Out[61]:
```
(5046.4, 2220)
```

In [60]:
```
```

Out[60]:
```
(5046.4, 2220)
```

In [ ]:
```
```