用轮廓线制作手绘图

In[∘]:=
```
contourFourierDescriptors[Line[contour_], n_] :=
                                      线段
 Module[{z, k}, z = Fourier[Complex @@@ contour];
 模块                 傅立叶     复数
  k = Max[Ceiling[1 / 2 Min[Length[contour] / 2, n]], 1];
      ⋯   向上取整          ⋯   长度
  z[[k ;; -k]] = 0;
  z]
```

In[∘]:=
```
reconstructContour[descriptors_] :=
 Module[{rc}, rc = ReIm[InverseFourier[descriptors]];
 模块                ⋯   离散傅立叶逆变换
  Line[Append[rc, rc[[1]]]]]
  线段  追加
```

In[∘]:=
```
smoothContour[contour_, n_] :=
 reconstructContour[contourFourierDescriptors[contour, n]]
```

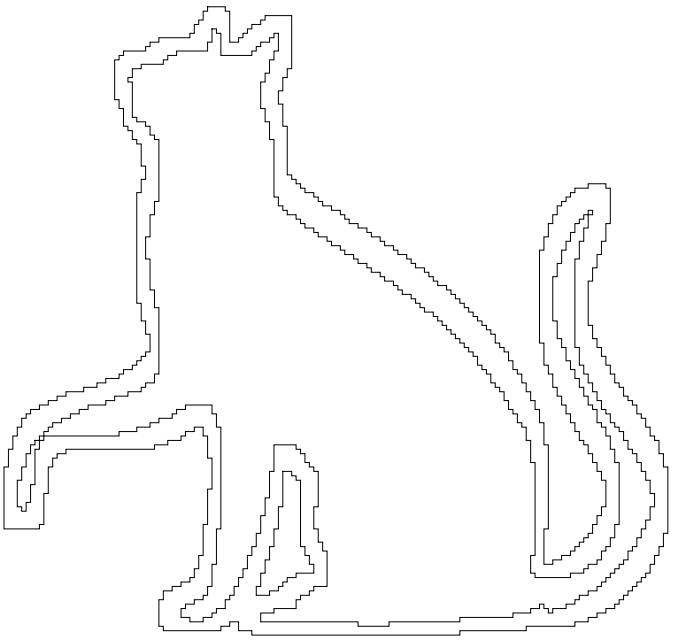
In[∘]:= img =  ;

In[∘]:=
```
(cs = Join @@ Values[ComponentMeasurements[Binarize[ColorNegate[img]], "Contours"]]) //
     连接    获取值   分量度量                   二值化     图像|彩色负片          等高线
 RandomChoice
 随机选择
```

Out[∘]=
```
Line[{{132, 96}, {132, 96}, {133, 96},
  {133, 96}, {133, 95}, {133, 95}, {132, 95}, {132, 95}, {132, 96}}]
```

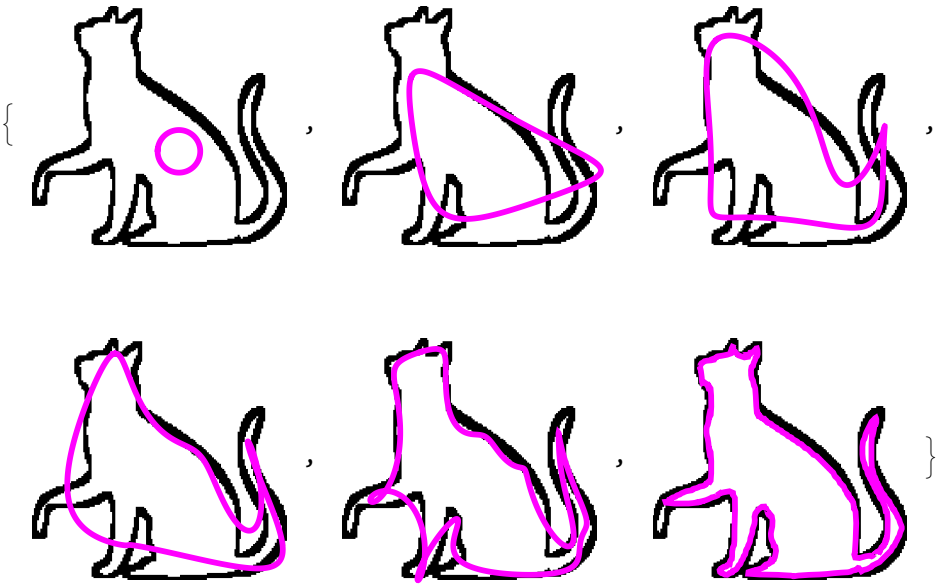
In[ ]:=
```
Graphics[cs]
```
图形

Out[ ]=

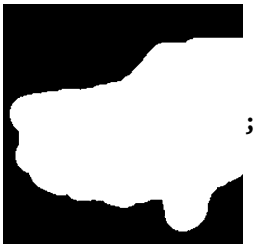


In[ ]:=
```
Table[HighlightImage[img, {AbsoluteThickness[3], smoothContour[cs[[2]], n]},
 PlotRangePadding → 10], {n, {3, 5, 9, 11, 21, ∞}}]
```
表格 突出显示图像 绝对粗细 填充绘制范围

Out[ ]=

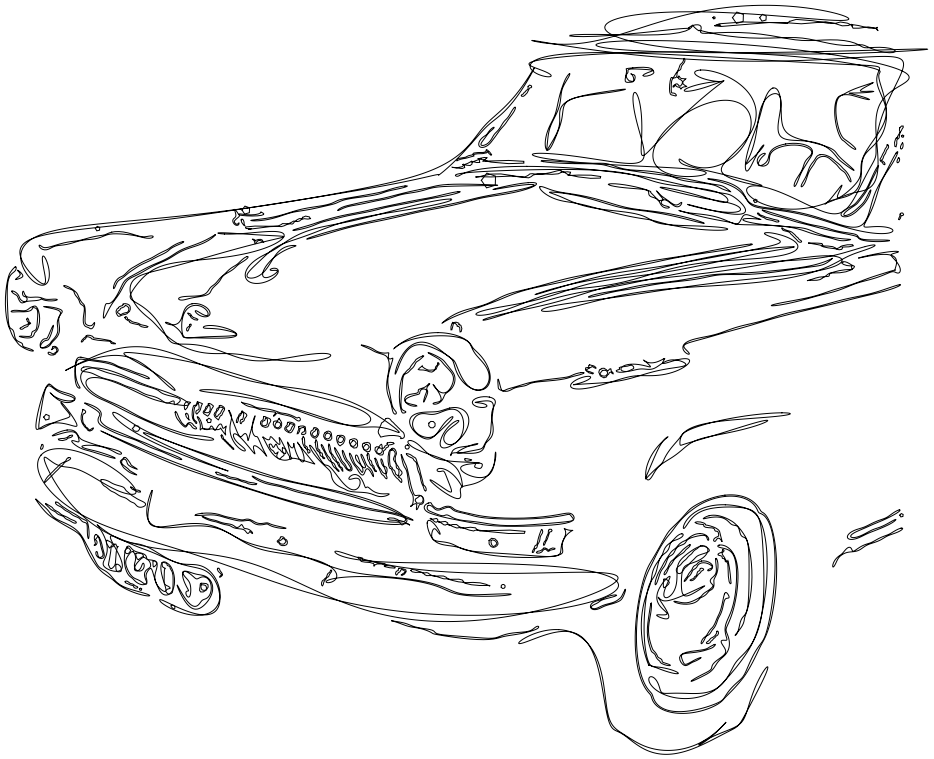


In[ ]:=
```
car =
```

```
; mask =
```

```
;
```

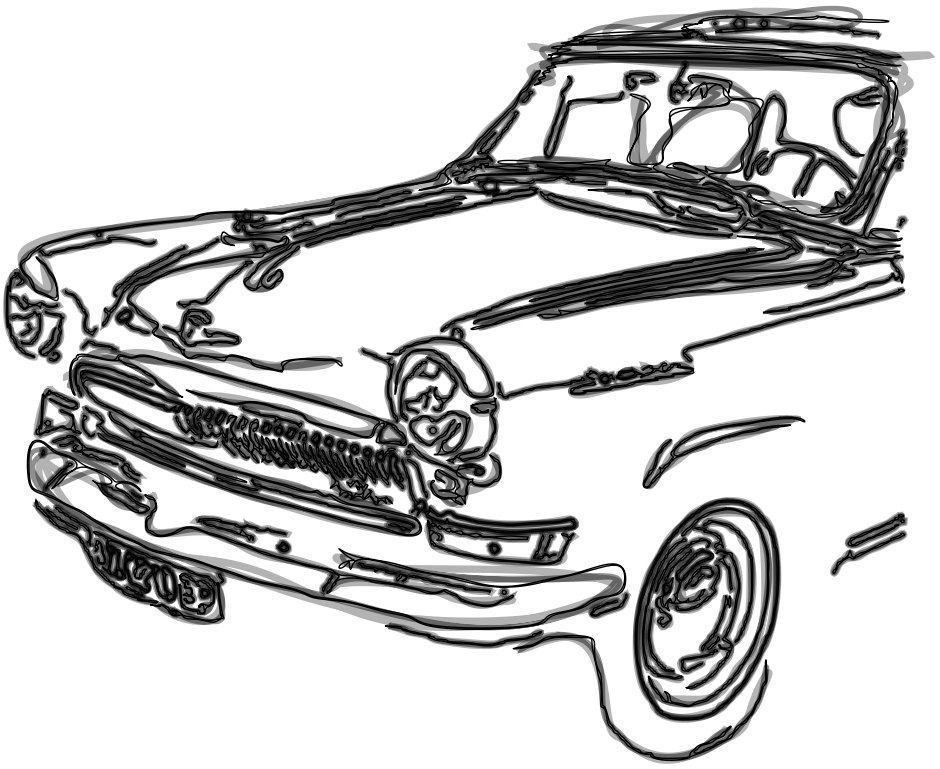
In[ ]:=
```
contours =
  ImageMeasurements[EdgeDetect[Blur[ImageMultiply[car, mask], 2], 1], "Contours"];
Graphics[smoothContour[#, 21] & /@ contours, ImageSize → 500]
```
图像度量 边缘检测 模糊 图像相乘 等高线
图形 图像尺寸

Out[ ]=



In[ ]:=
```
Graphics[Table[{GrayLevel[0, n / 70], AbsoluteThickness[80 / n],
  (reconstructContour[contourFourierDescriptors[#1, n]] &) /@ contours},
 {n, {21, 31, 111}}], ImageSize → 500]
```
图形 表格 灰度级 绝对粗细 图像尺寸

Out[ ]=



In[ ]:=
```
contours =
  ImageMeasurements[EdgeDetect[Blur[ImageMultiply[car, mask], 2], 1], "Contours"];
  图像度量          边缘检测    模糊  图像相乘                          等高线
Graphics[contours, ImageSize → 500]
图形               图像尺寸
```

Out[ ]=