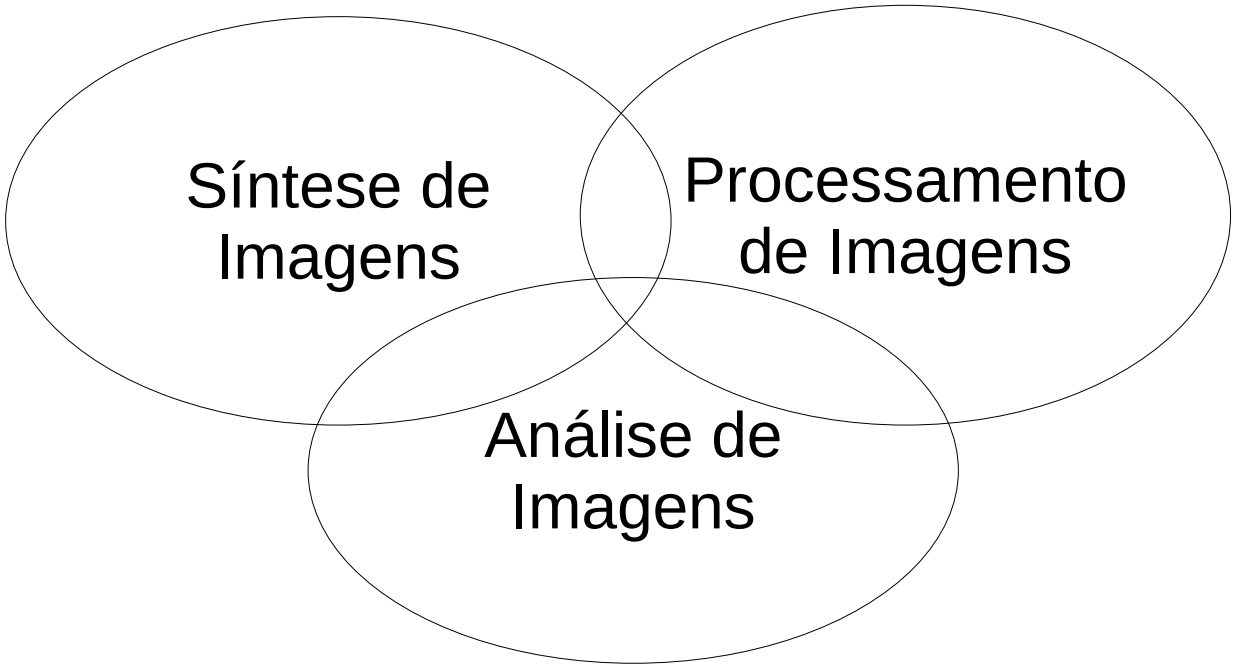
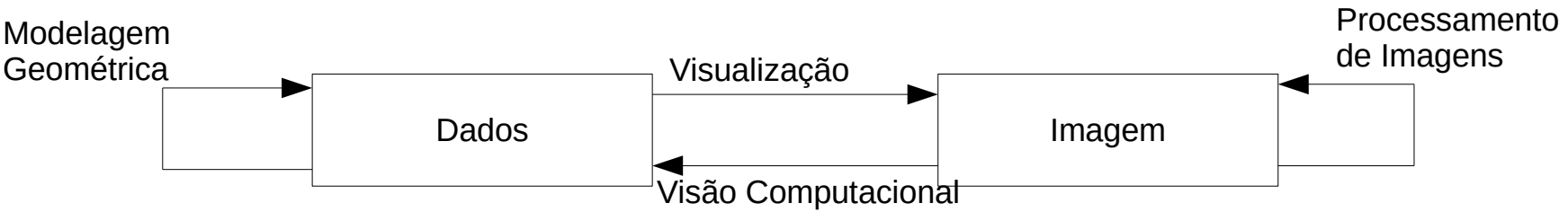
Computação Gráfica

Introdução

- 3 grandes áreas



Introdução

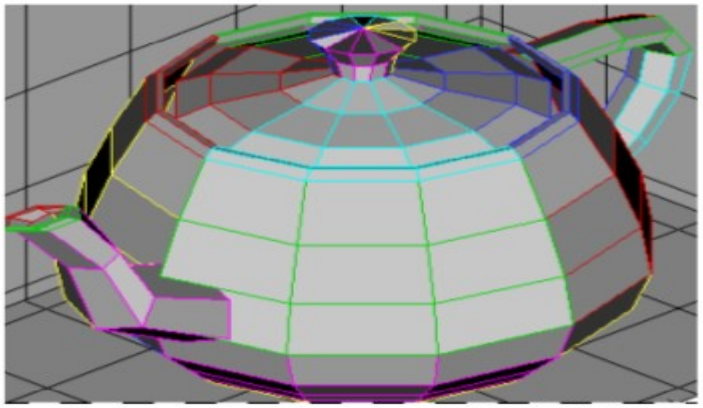

Modelagem
Geométrica
Dados
Visualização
Visão Computacional
Imagem
Processamento
de Imagens

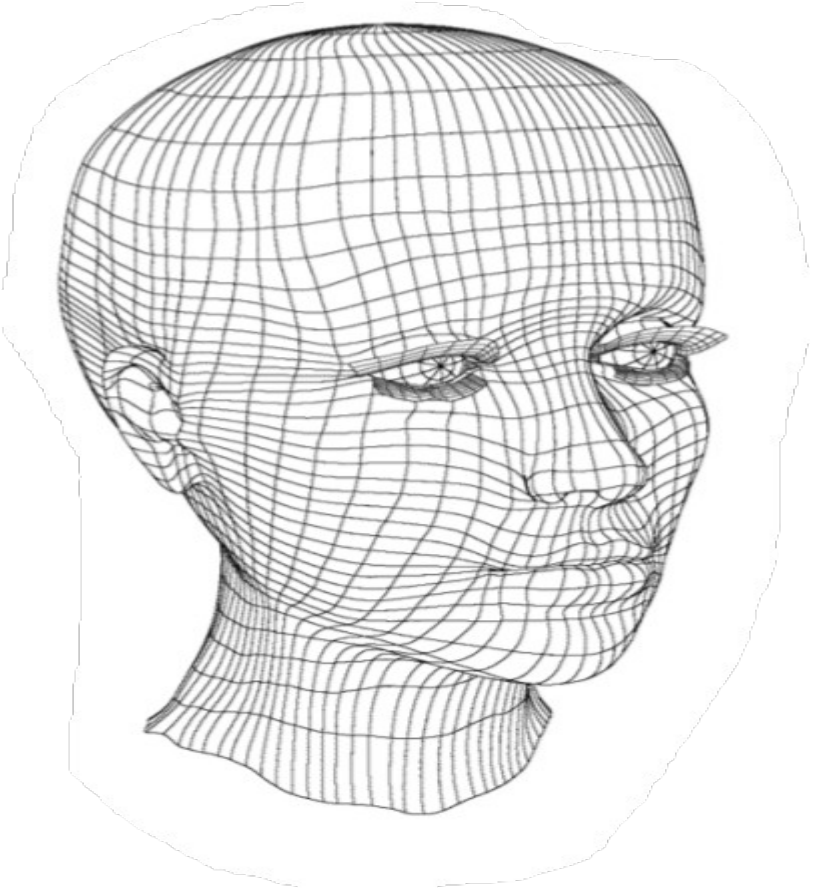
Modelagem Geométrica

- Representação da realidade
  - Geometria
  - Fotometria
- Como?
  - Interativo
  - Algorítmico
  - Scanning

Modelagem Geométrica

- Interativa



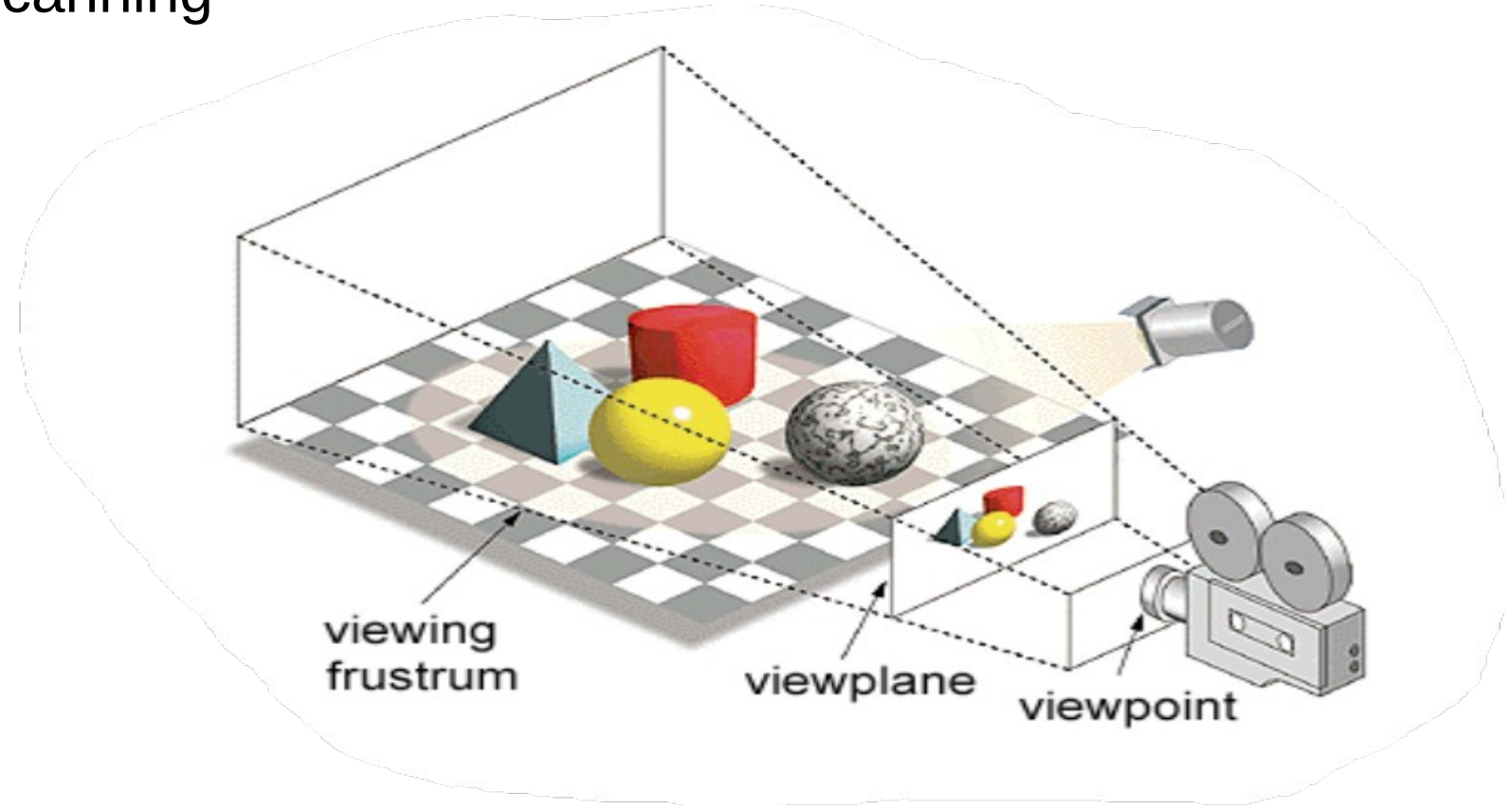


Modelagem Geométrica

- 3DS MAX
  - http://www.autodesk.com/products/3ds-max/overview
- SketchUp
  - http://www.sketchup.com/
- Blender
  - https://www.blender.org/
- POV-Ray
  - http://www.povray.org/

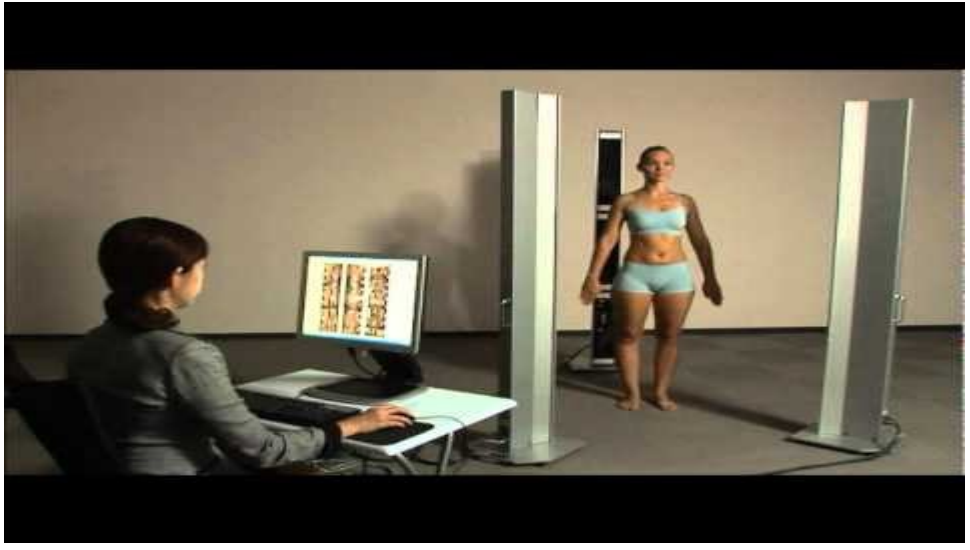
Modelagem Geométrica

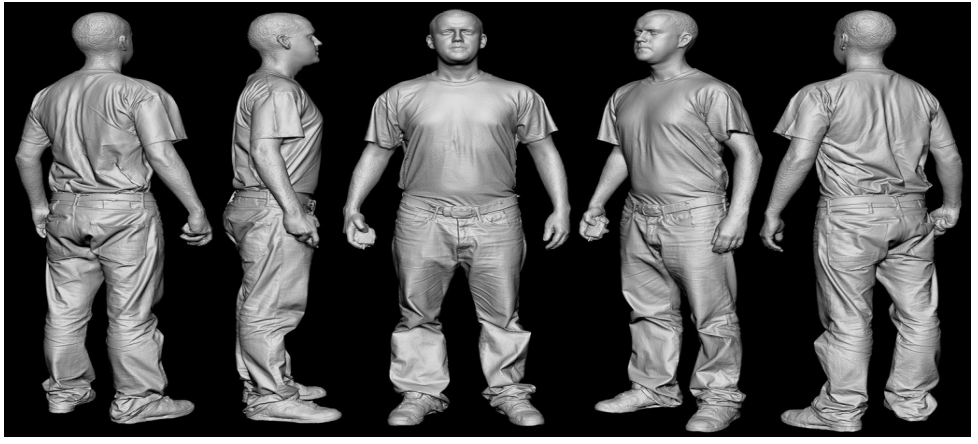
- Scanning



Modelagem Geométrica

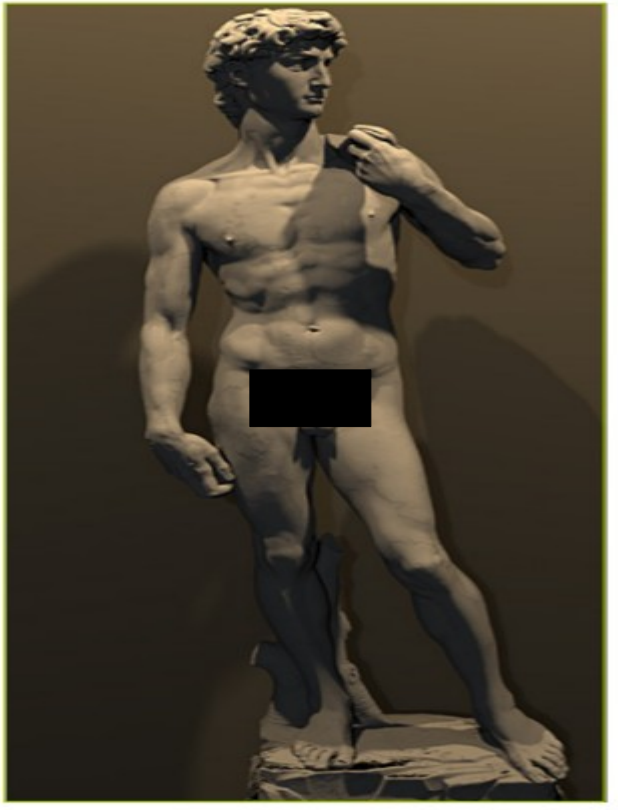
- Scanning





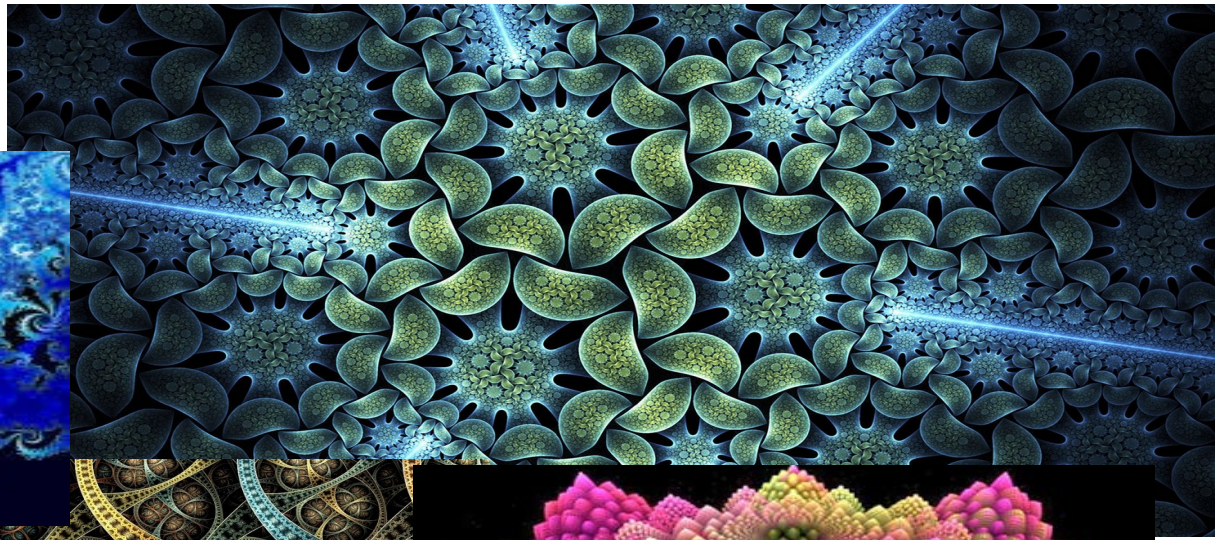
Modelagem Geométrica

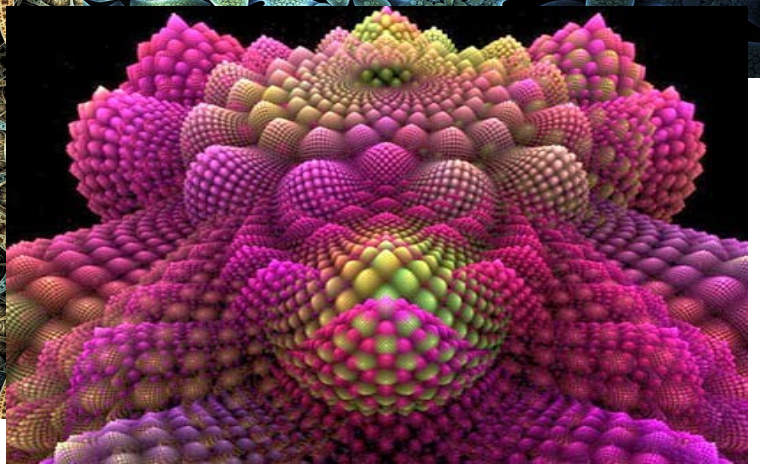
- 480 câmeras
- 2 bilhões de polígonos
- 7000 imagens coloridas
- 32 Gigabytes
- 30 noites de escaneamento
- 22 pessoas envolvidas



Modelagem Geométrica

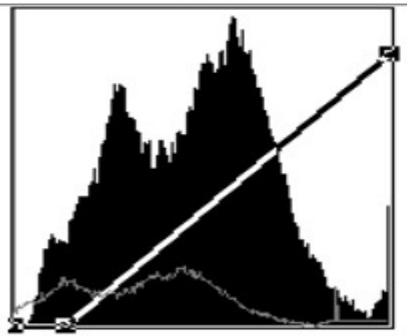
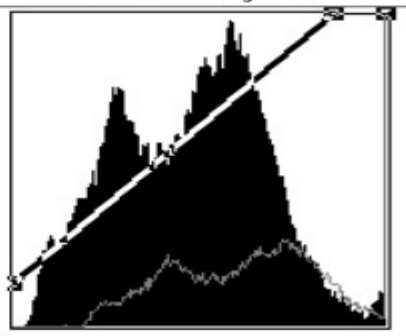
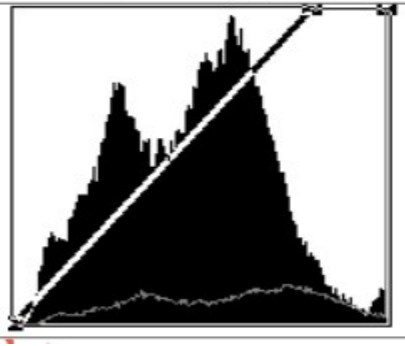
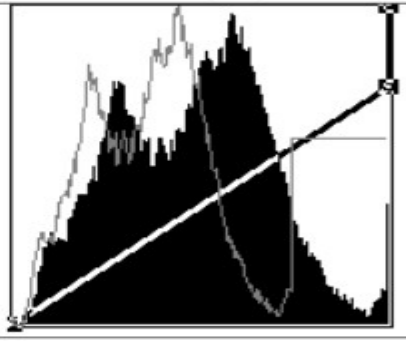
- Algorítmico





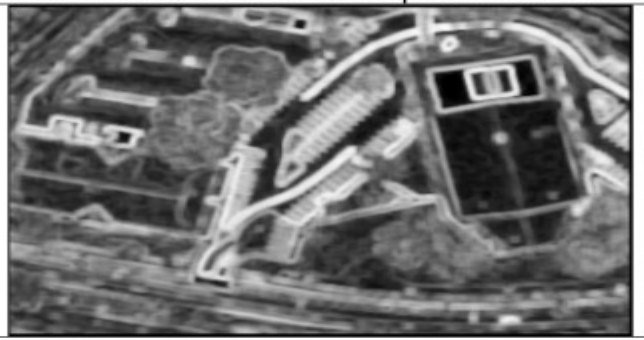
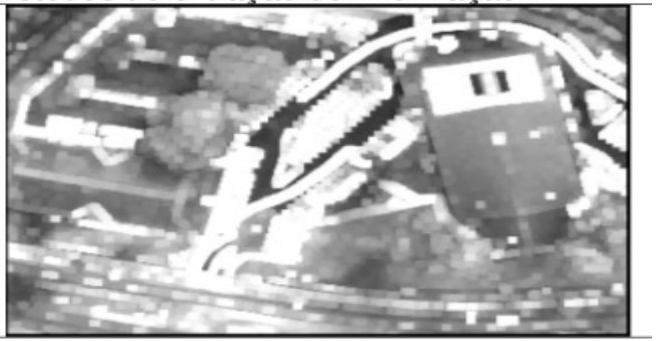
Processamento de Imagens

- Ponto a ponto

SOMA	$g(x, y) = f(x, y) + 20$	SUBTRAÇÃO	$g(x, y) = f(x, y) + (-20)$
			
MULTIPLICAÇÃO	$g(x, y) = f(x, y) * 1.25$	DIVISÃO	$g(x, y) = f(x, y) * 0.75$
			

Processamento de Imagens

- Filtros

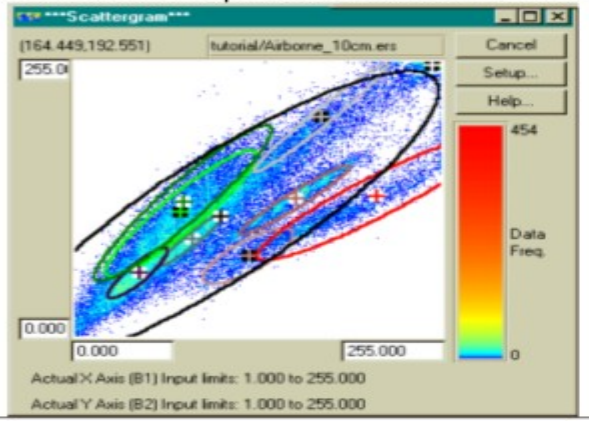
Mediana: filtro útil para remoção de ruído sem alterar muito a definição das bordas	Variância: operador focal útil para caracterizar de maneira simples a textura.	Moda: filtro útil para remover pixels isolados numa classificação.
		
Realce local: filtro de realce local da textura; esse filtro reduz as freqüências baixas.	Passa banda: filtro que deixa passar apenas algumas freqüências; de 3 a 5 pixels neste caso.	Máximo: operador focal usado em conjunção com o mínimo para certos métodos de extração de informação.
		

Análise de Imagens

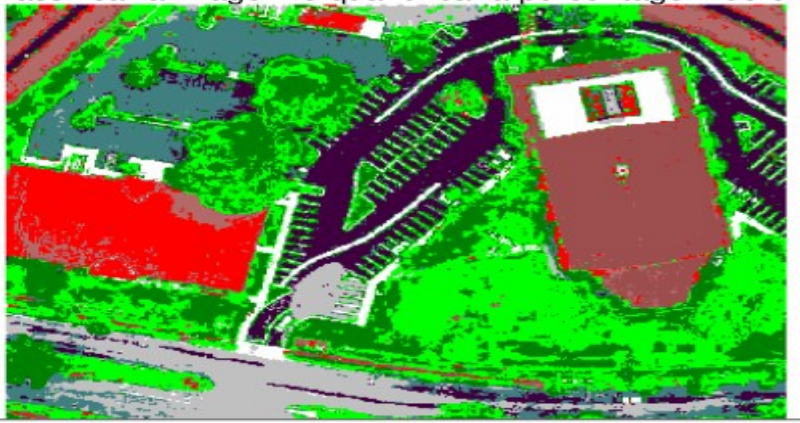
1. Adquirir uma intimidade com a imagem

2. Criar as áreas de trenamento

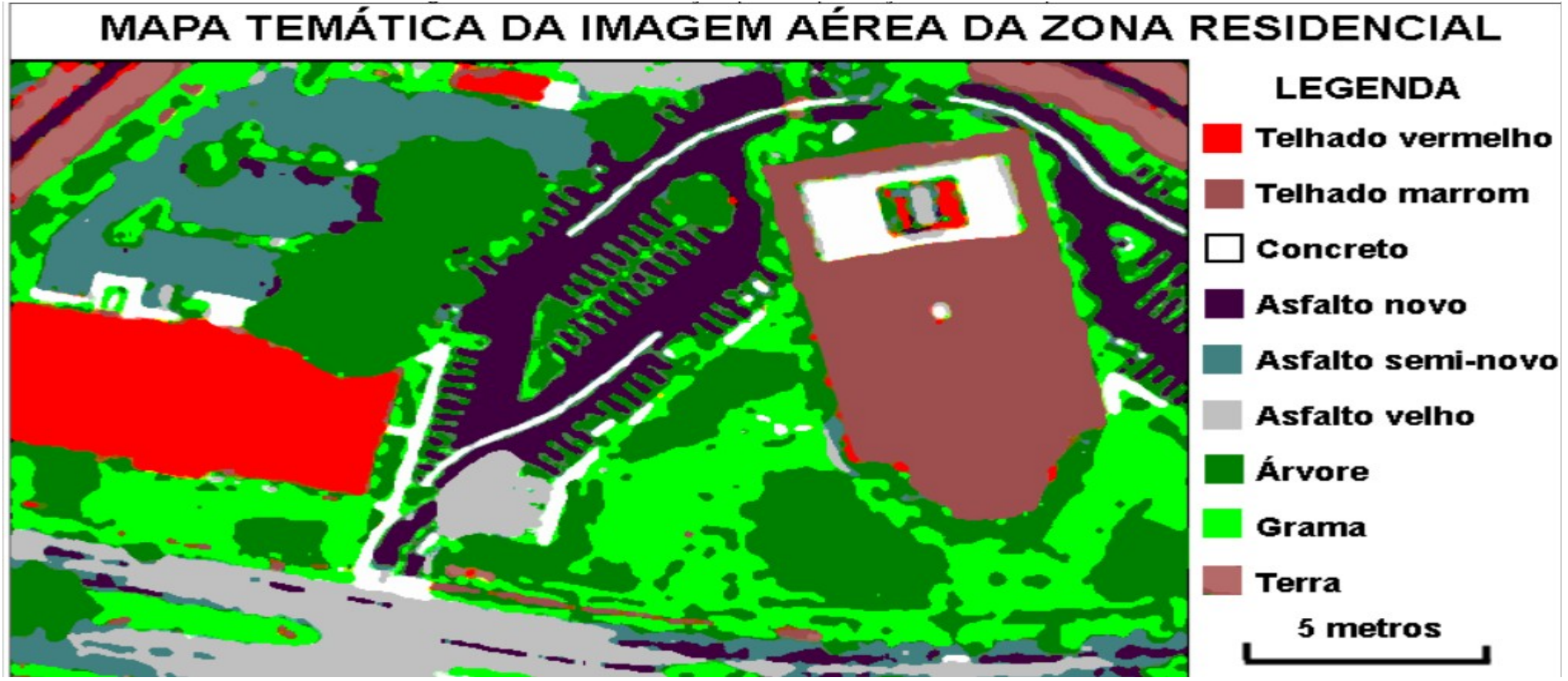
3. Conferir a separabilidade das classes



4. Classificar a imagem e quantificar a porcentagem de erros

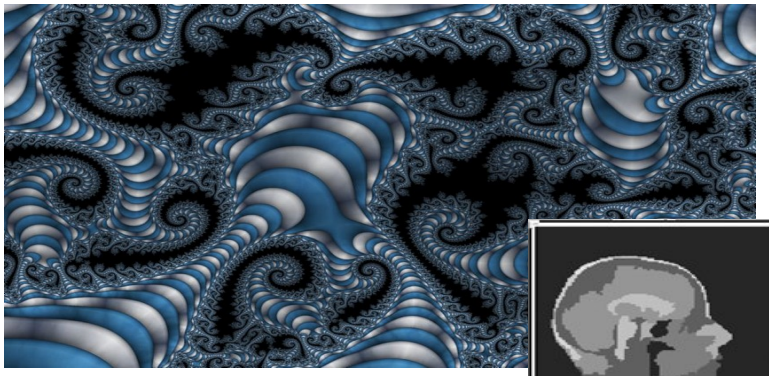


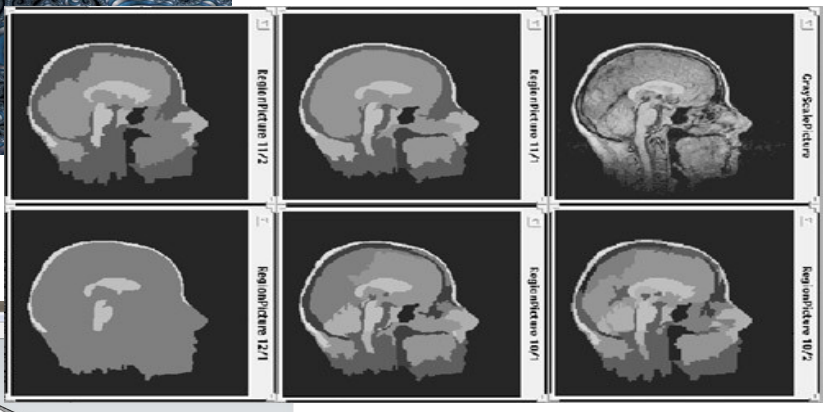
Análise de Imagens

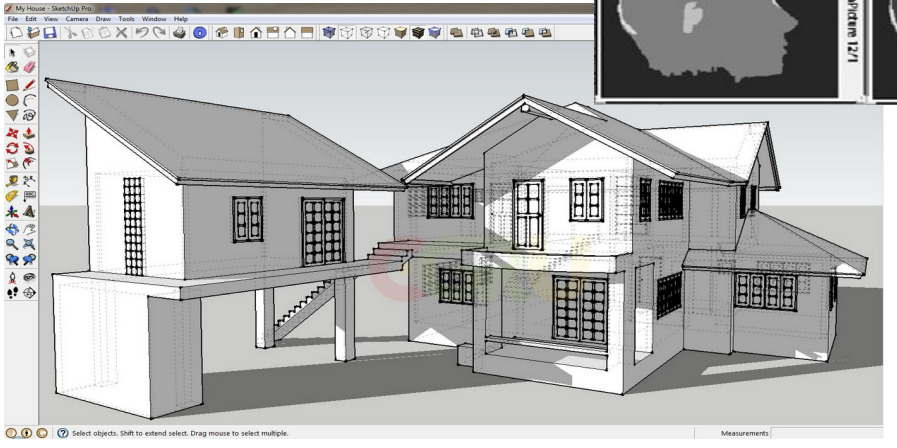


Aplicações

- Arte
- Medicina
- Arquitetura

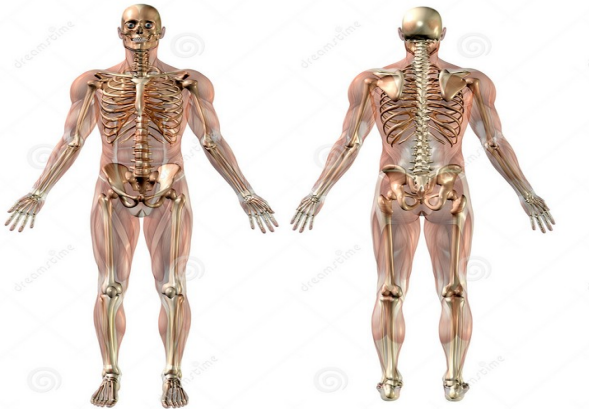






Aplicações

- Astronomia
- Marketing
- Moda
- Lazer
- Psicologia
- Educação

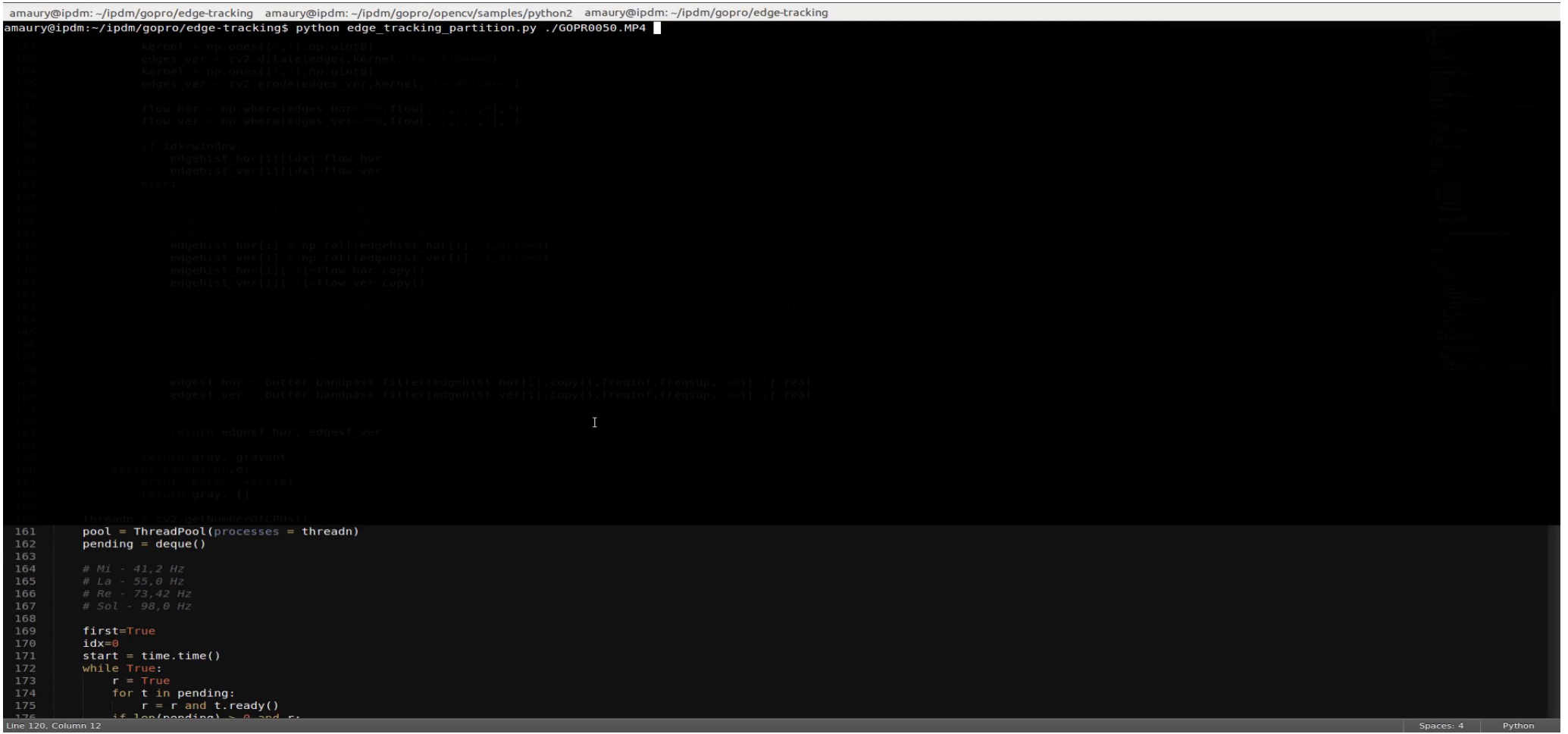


Aplicações

Augmented Reality

Charizard

Aplicações


amaury@ipdm: ~/ipdm/gopro/edge-tracking
amaury@ipdm: ~/ipdm/gopro/opencv/samples/python2
amaury@ipdm: ~/ipdm/gopro/edge-tracking
amaury@ipdm:~/ipdm/gopro/edge-tracking$ python edge_tracking_partition.py ./GOPR0050.MP4
pool = ThreadPool(processes = threadn)
pending = deque()
# Mi - 41,2 Hz
# La - 55,0 Hz
# Re - 73,42 Hz
# Sol - 98,0 Hz
first=True
idx=0
start = time.time()
while True:
r = True
for t in pending:
r = r and t.ready()
Line 120, Column 12
Spaces: 4
Python

Aplicações

amaury@ipdm: ~/IPL2 amaury@ipdm: ~/ipdm/gopro/edge-tracking

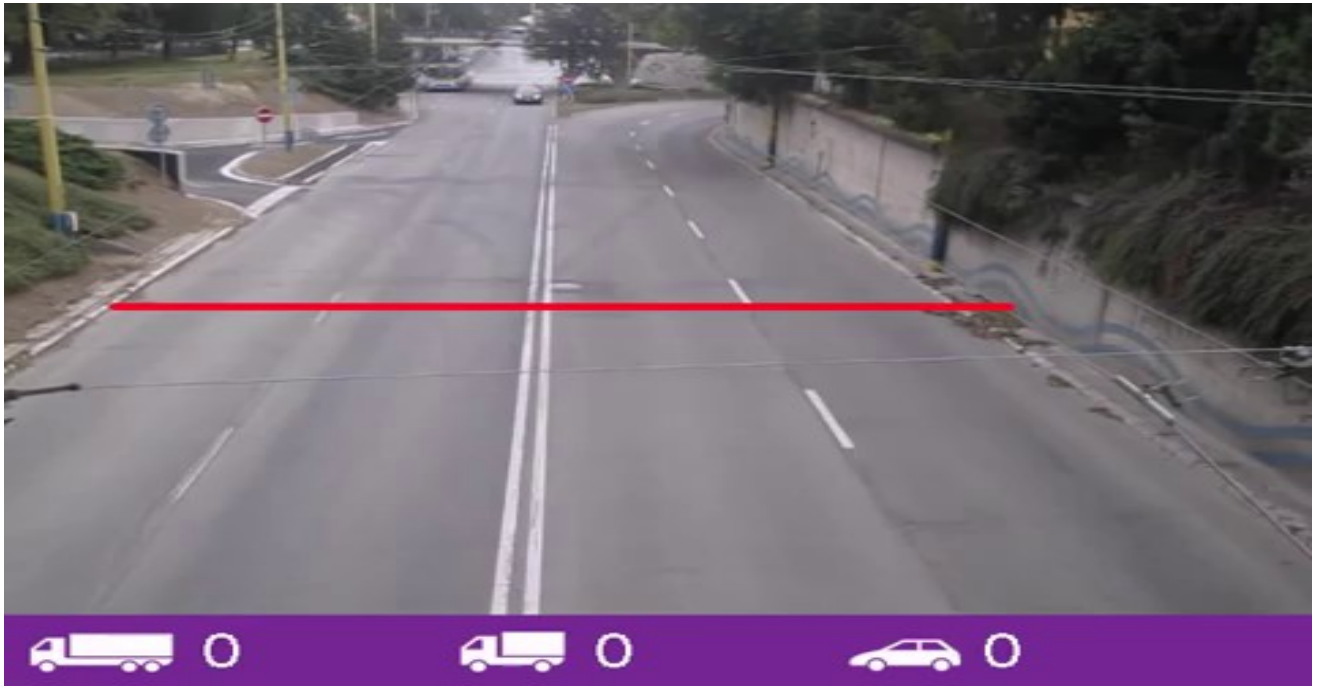
```
amaury@ipdm:~/ipdm/gopro/edge-tracking$ python edge_tracking_partition.py GOPR0045.MP4
```

```
122             kernel = np.ones((3,1),np.uint8)
123             edges_ver = cv2.dilate(edges,kernel,iterations=2)
124             kernel = np.ones((1,3),np.uint8)
125             edges_ver = cv2.erode(edges_ver,kernel,iterations=2)
126 
127             flow_hor = np.where(edges_hor>200,flow[...,...,0],0)
128             flow_ver = np.where(edges_ver>200,flow[...,...,1],0)
129 
130             if idx<window:
131                 edgehist_hor[i][idx]=flow_hor
132                 edgehist_ver[i][idx]=flow_ver
133             else:
134                 #edgehist_hor[i][0:-2] = edgehist_hor[i][1:-1].copy()
135                 #edgehist_hor[i][-1] = flow_hor.copy()
136                 #edgehist_ver[i][0:-2] = edgehist_ver[i][1:-1].copy()
```

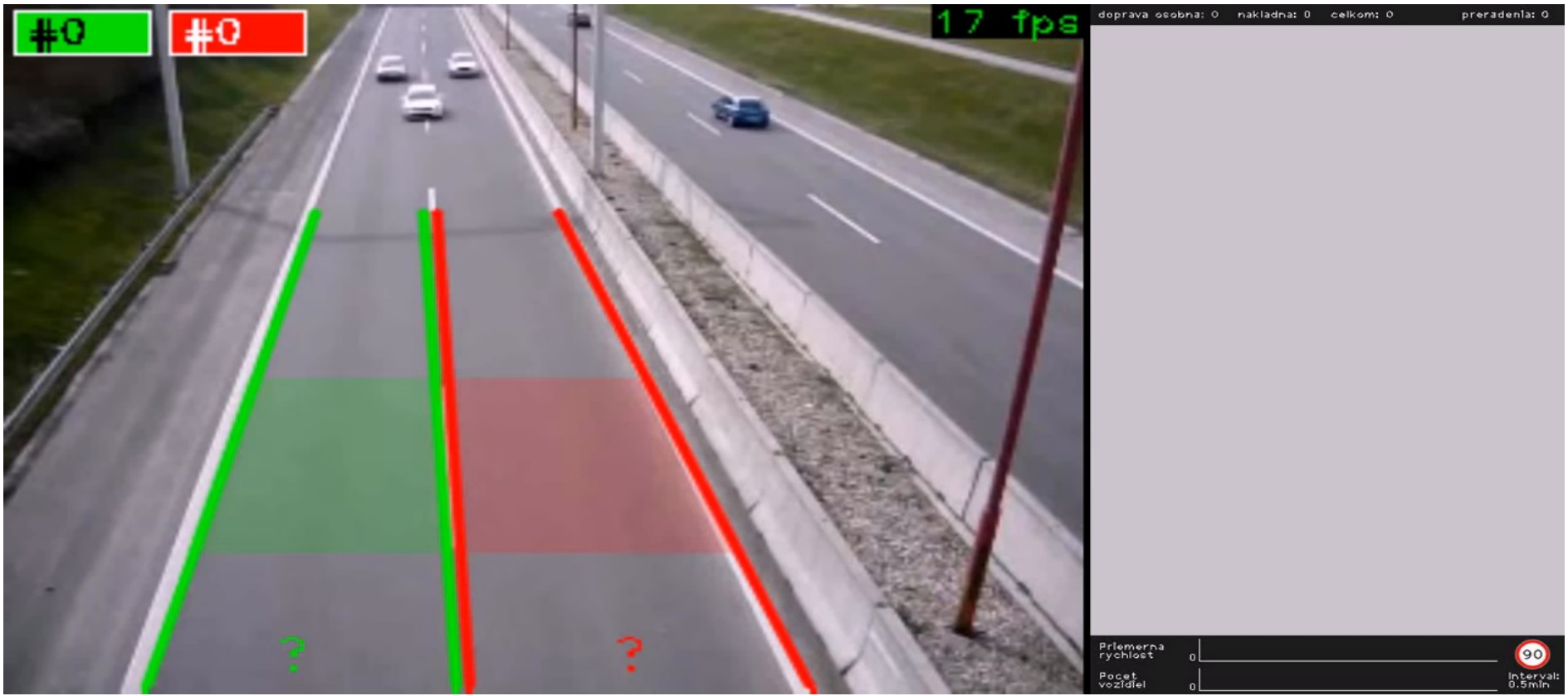
Line 102, Column 1 Tab Size: 4 Python

Aplicações

- Segurança
  - Detecção de movimento



Aplicações


#0
#0
17 fps
doprava osobna: 0
nakladna: 0
celkom: 0
preradenia: 0
Priemerna rychlost
0
90
Pocet vozidiel
0
Interval: 0.5min