Insper

# Robótica Computacional

# Semana 3 – detecção de retas e circunferências

#### **Avisos**

- Exemplo da APS 2
  - Vídeo
  - Autograding
- Centro do contorno
  - Média das coordenadas dos contornos

```
xc = contorno[:,:,0]yc = contorno[:,:,1]
```

- Centro de massa (usar este!!)
  - M = cv2.moments(contorno)
  - xc = M["m10"]/M["m00"]
  - yc = M["m01"]/M["m00"]
  - Ver: <u>OpenCV: cv::Moments Class Reference</u>
  - Ver: <a href="https://learnopencv.com/shape-matching-using-hu-moments-c-python/">https://learnopencv.com/shape-matching-using-hu-moments-c-python/</a>

#### Avisos - Introduction to ROS

https://cse.sc.edu/~jokane/agitr/ - Capítulos 1 a 3

```
A Gentle Introduction to ROS
                                                                                                A Gentle Introduction to ROS
ROS (Robot Operating System) is rapidly becoming a de facto
standard for writing interoperable and reusable robot software. This
book supplements ROS's own documentation, explaining how to interact with existing ROS systems and how to create new ROS
                                                                                                                                           Jason M. O'Kane
programs using C++, with special attention to common mistakes are
misunderstandings. The intended audience includes new and potentia
            ★ Installing ROS ★ Writing ROS programs ★
                   * Publishing and subscribing *
          ★ Generating log messages ★ Using launch files ★
              ★ Setting parameters ★ Calling services ★
                       * Recording messages *
Jason M. O'Kane is Associate Professor of Computer Science and
Engineering at the University of South Carolina. He works in robotics
```

Linux funcional – ver alternativas

#### Avisos – instalando o Scikit-Learn

Win: conda install -c conda-forge scikit-learn Linux: pip3 install scikit-learn

Linux - gravando a tela Ctrl Alt Shift R

#### Permitindo gravar indefinidamente

gsettings set org.gnome.settings-daemon.plugins.mediakeys max-screencast-length 0

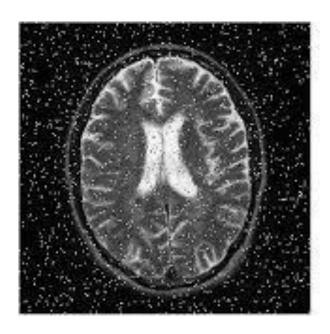
# Filtro de Convolução

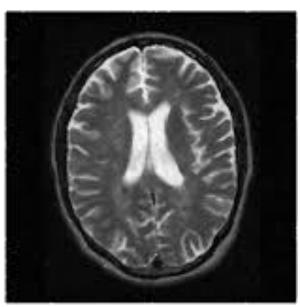
Convolução 1D

## Aplicações – Efeitos especiais

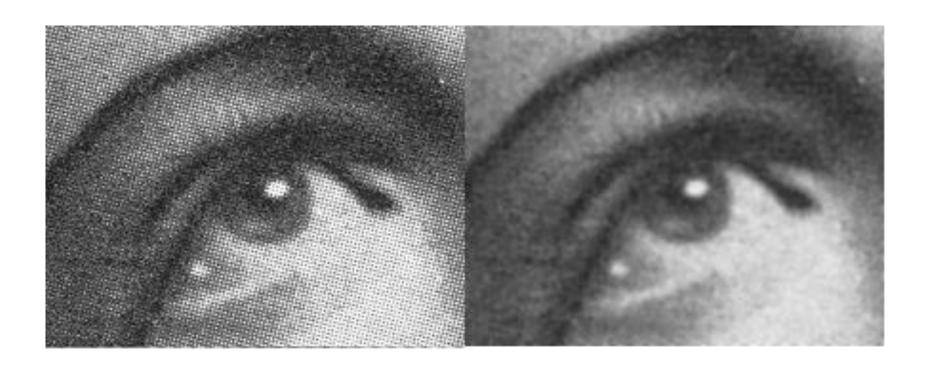


#### Aplicações - redução ou remoção de ruído

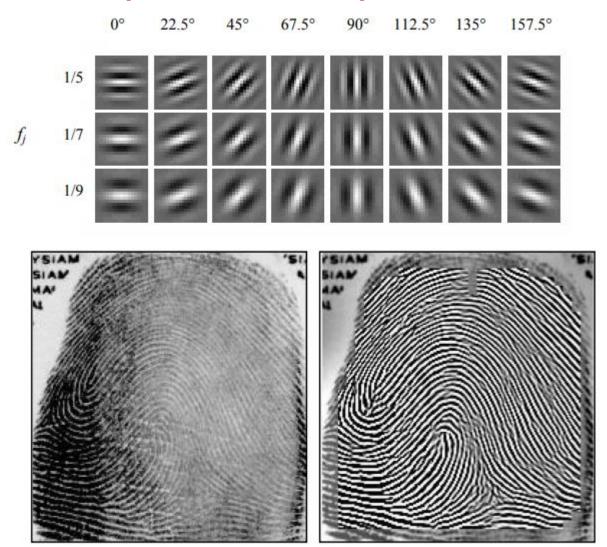




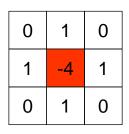
# Aplicações - Recuperação da imagem



#### Realce de padrões específicos



#### Convolução em imagem



h(x,y)

Exemplo de realização de convolução:

https://www.youtube.com/watch?v= iZ3Q7VXiGI

	186	167	150	154	152	182
	210	190	186	162	150	145
	222	201	186	179	140	133
	215	199	190	188	186	150

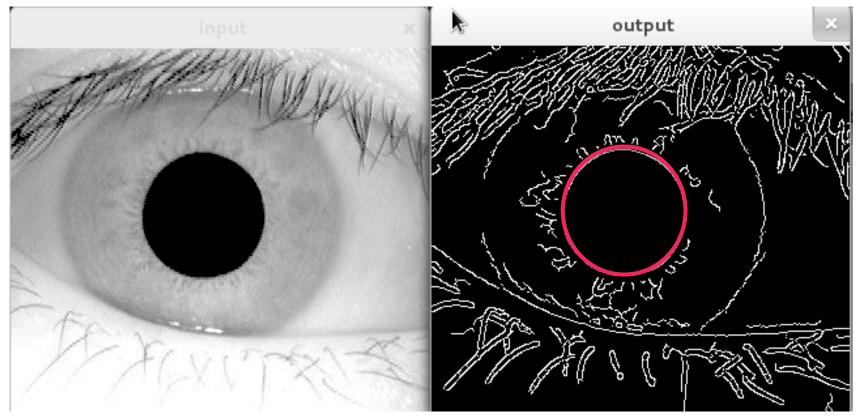
 $I_1(x,y)$ 

## Encontrando retas com a Transformada de Hough

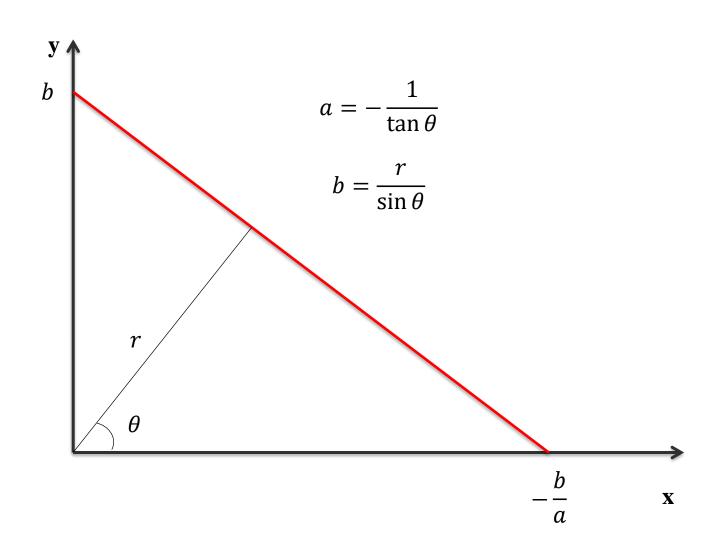
#### Exemplo de aplicação da detecção de retas



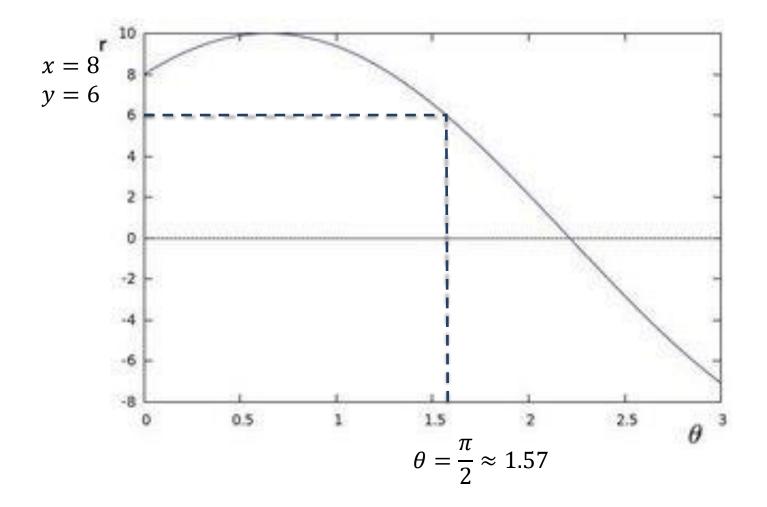
#### Exemplo de detecção de circunferências



http://stackoverflow.com/questions/10716464/what-are-the-correct-usage-parameter-values-for-houghcircles-in-opency-for-iris



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http://docs.opencv.org/2.4.13/doc/tutorials/imgproc/imgtrans/hough\_lines/hough

