Detecção de Faces Usando Classificadores Haar (Parte 2)

ES235 - Aula 18
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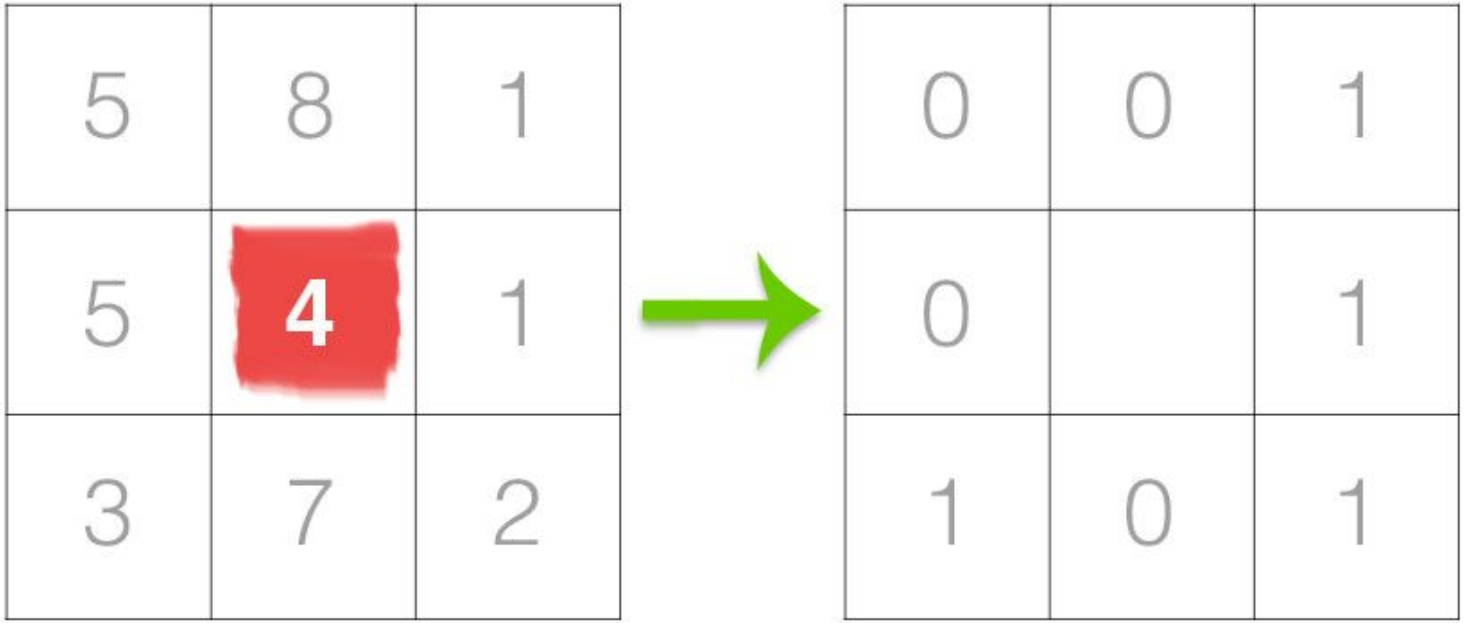
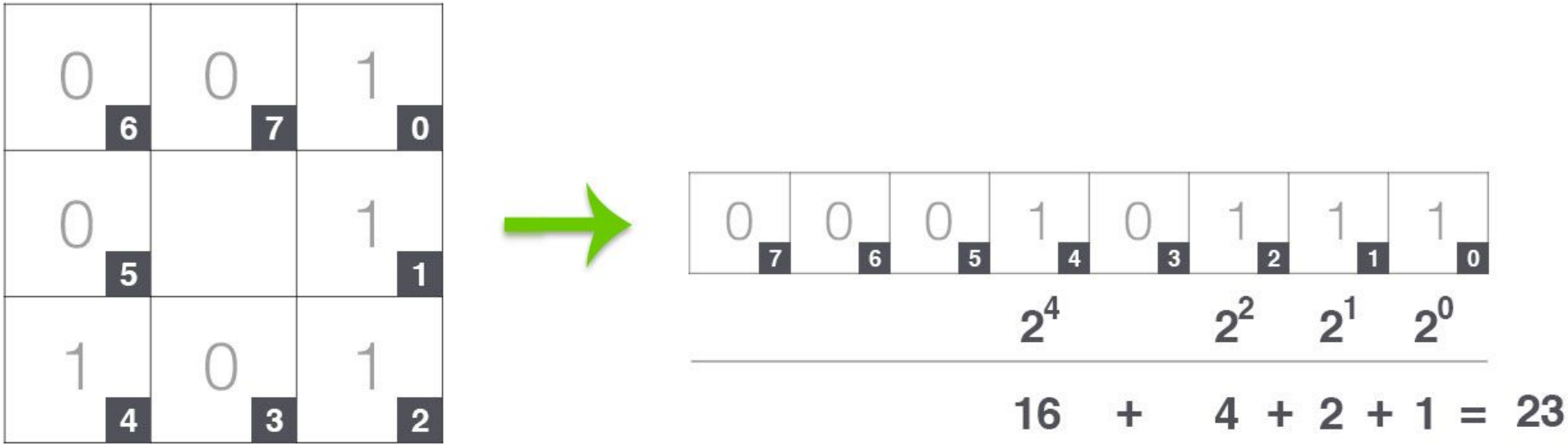
LBP (Local Binary Patterns)

- Descritor baseado em padrões de textura
- “Multiresolution Grayscale and Rotation Invariant Texture Classification with Local Binary Patterns”, 2002
- Representação local ao invés de global
- Baseado na vizinhança 3x3 do pixel

LBP (Local Binary Patterns)



LBP (Local Binary Patterns)



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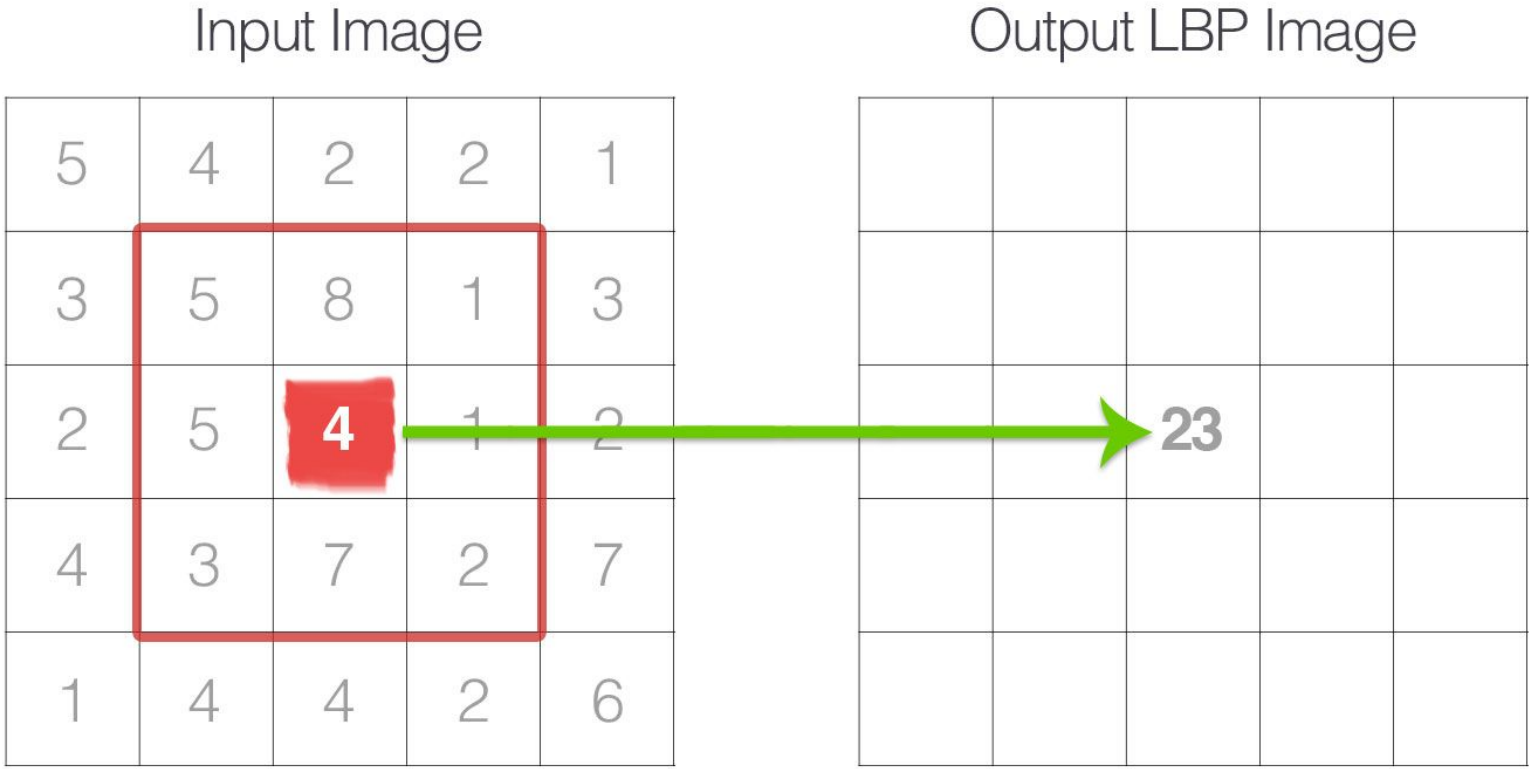

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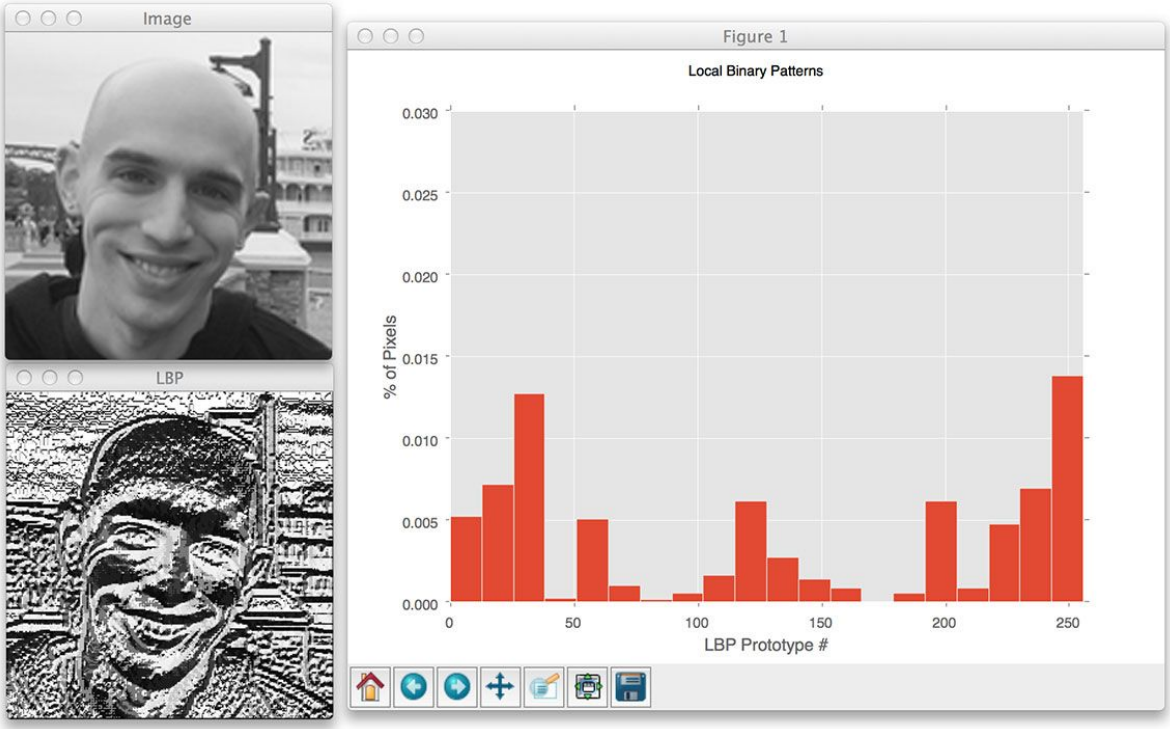
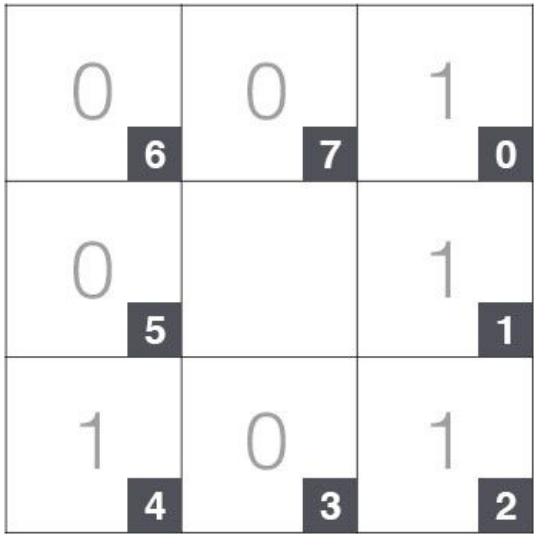


LBP (Local Binary Patterns)

Como tornar o LBP invariante à rotação?

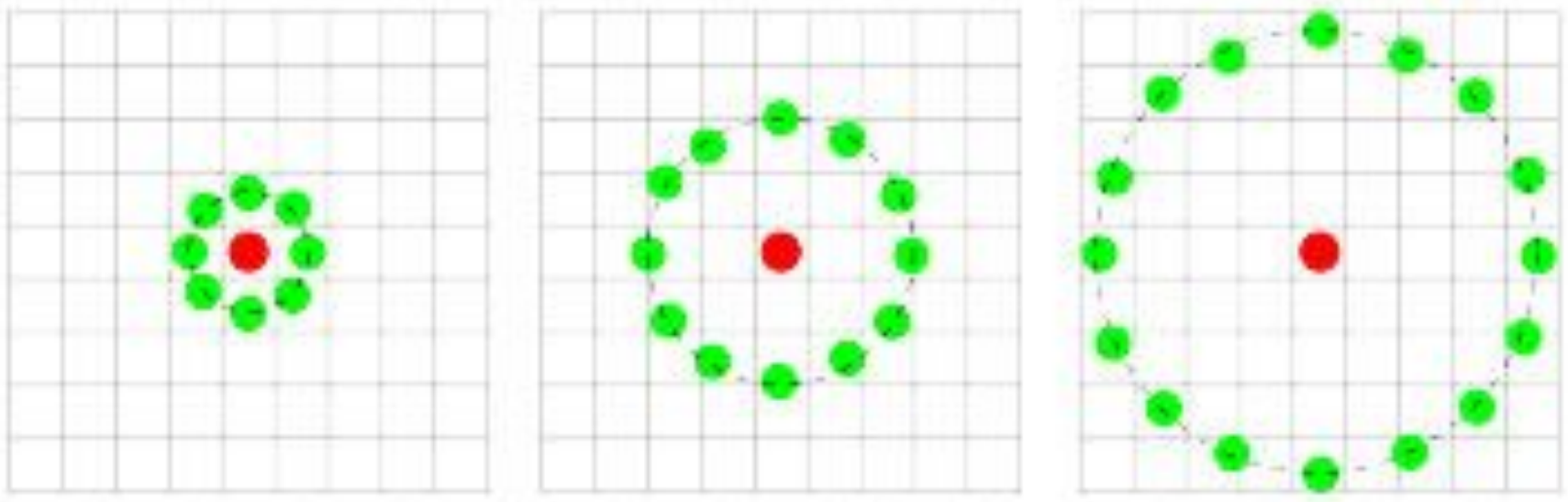
Escolher o menor/maior valor calculado a partir do LBP

00010111,
10001011,
11000101,
11100010...



LBP para Reconhecimento de Texturas

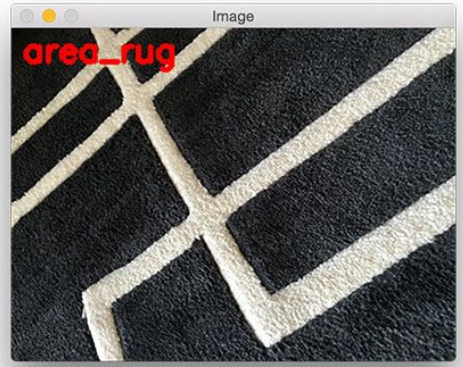
Variação dos parâmetros

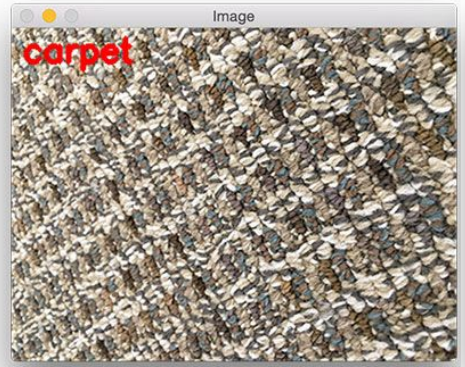


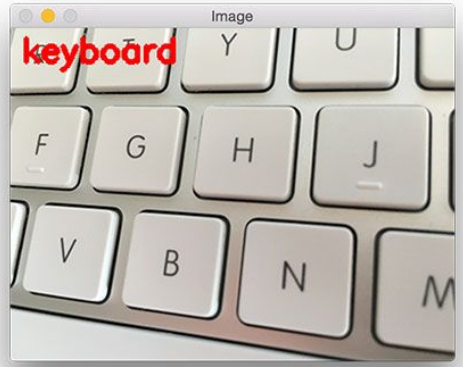
LBP para Reconhecimento de Texturas

LBP para Reconhecimento de Texturas

Usando Histograma dos LBPs calculados e SVM, tem-se como resultado:







Haar vs LBP

Algorithm	Advantages	Disadvantages
Haar	1. High detection accuracy 2. Low false positive rate	1. Computationally complex and slow 2. Longer training time 3. Less accurate on black faces 4. Limitations in difficult lightening conditions 5. Less robust to occlusion
LBP	1. Computationally simple and fast 2. Shorter training time 3. Robust to local illumination changes 4. Robust to occlusion	1. Less accurate 2. High false positive rate

Conclusão

“In the game of AI, data is the King. The organization with the largest dataset and more representative dataset will always win.”

É possível construir um treinamento superior às bases padrão que acompanham o OpenCV.

Padrão: 89% (reconhecimento de olhos)

Objetivo: 97% (Haar) e 94% (LBP)

REFERÊNCIAS

Rafael C. Gonzalez and Richard E. Woods. 2006. Digital Image Processing (3rd Edition). Prentice-Hall, Inc., Upper Saddle River, NJ, USA.

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