CONFIDENTIAL B

P40 CA-LTM Introduction & Usage

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Outline

1. Function Overview
2. Feature特點
3. 調整與算法說明
4. Tool 使用說明

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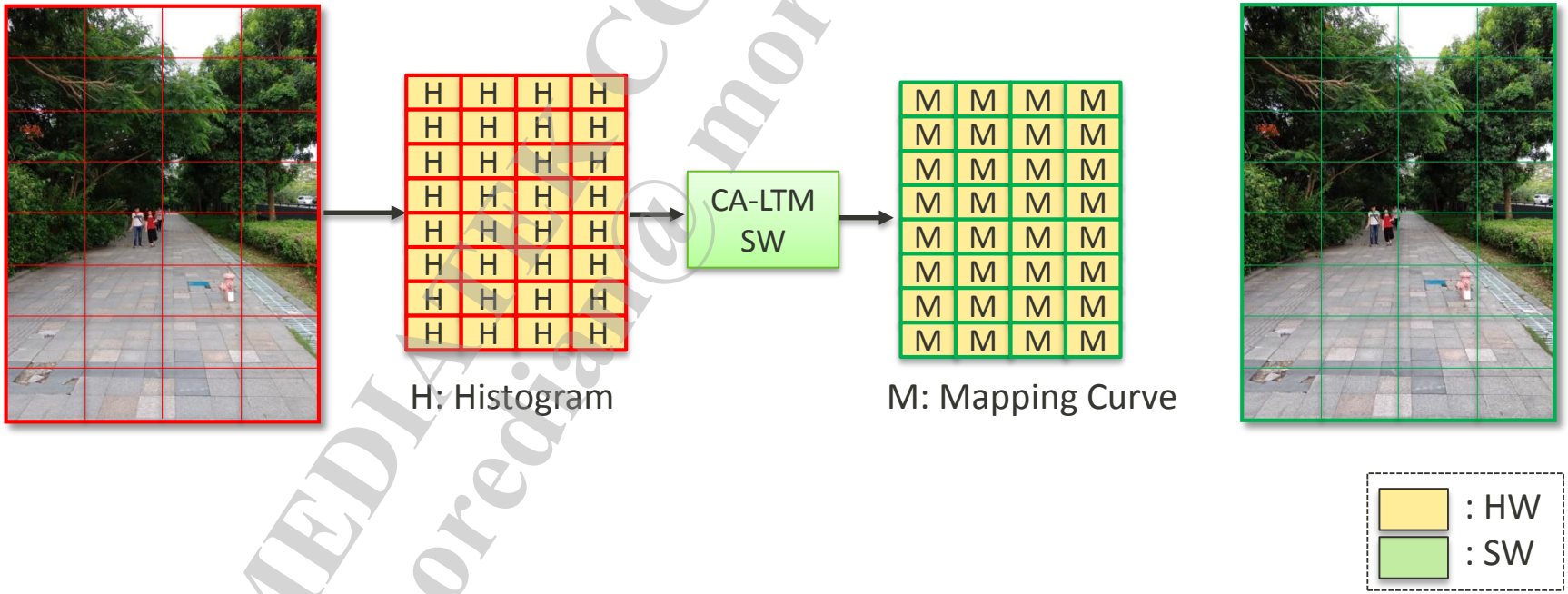
CA-LTM: Content-Aware Local Tone Mapping

- Block-based approach to local contrast enhancement
- Content-aware algorithm making details stand out



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Feature 特點

1. 不影響整體平均亮度
2. 局部對比/細節強化
3. 膚色/平坦區 保護機制
4. 雜訊影響小

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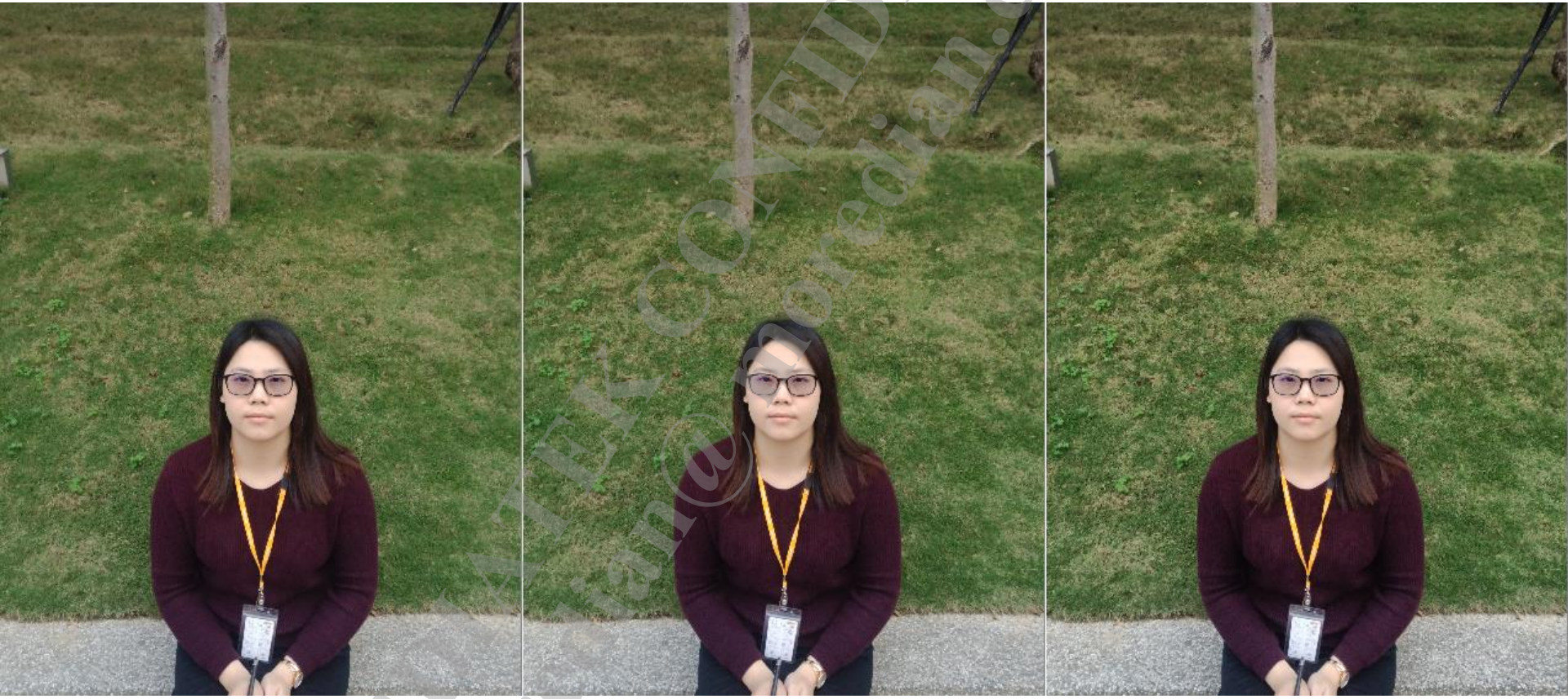
不影響整體平均亮度

- 即使強度不同，整體平均亮度皆一致



OFF　　DEFAULT　　STRONG

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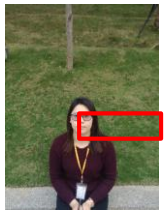

局部對比/細節強化

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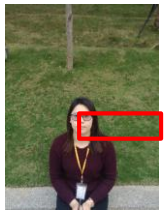
CA-LTM OFF



局部對比/細節強化

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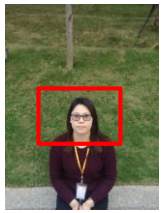

膚色/平坦區 保護機制

- 可針對膚色/平坦區保護，降低強化效果

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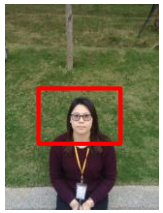
CA-LTM OFF



膚色/平坦區 保護機制

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雜訊影響小

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CA-LTM OFF

雜訊影響小

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CA-LTM Software Flow

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Histogram Equalization (HE) (1/5)

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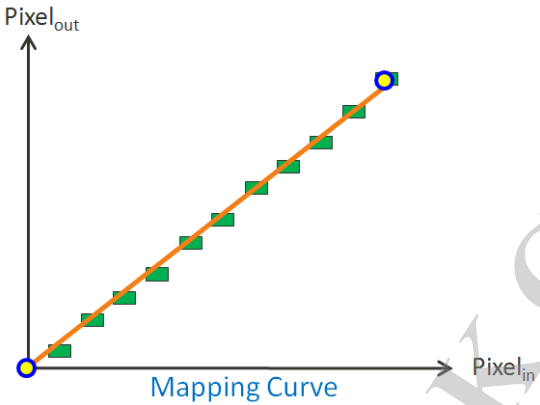
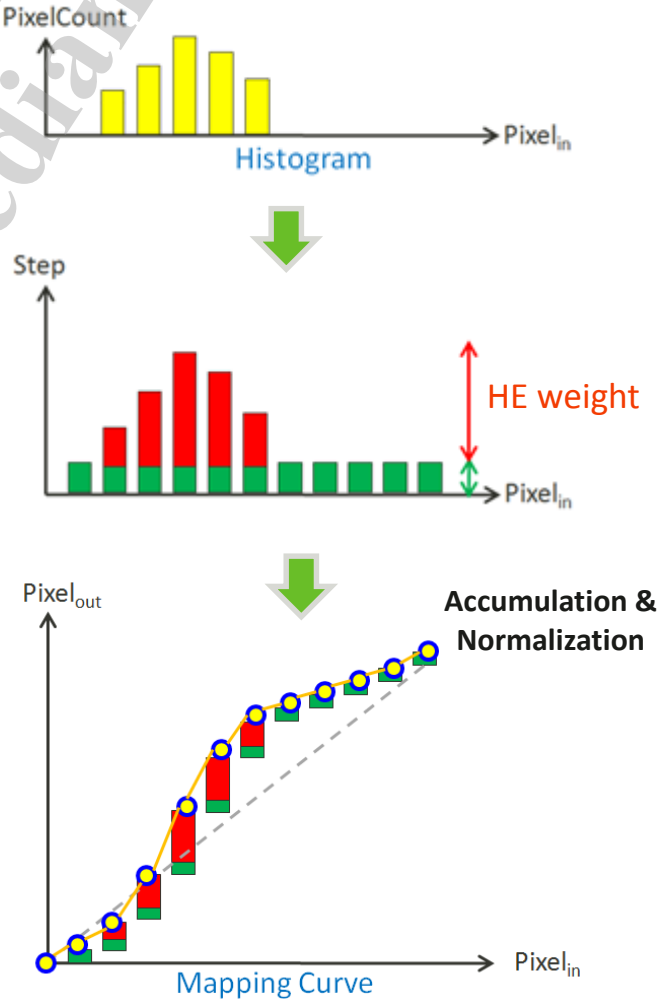
Histogram Equalization (HE) (2/5)

- Strength = 0 **NO HE weight**



- Larger Strength **Larger HE weight**



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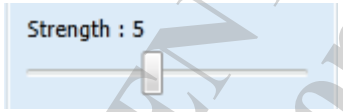
Histogram Equalization (HE) (3/5)

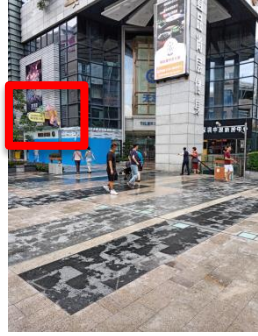
Strength = 0, (CA-LTM OFF)

Histogram Equalization (HE) (4/5)

Strength = 5 (recommend)

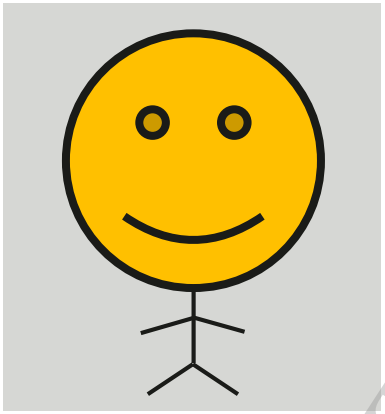


Histogram Equalization (HE) (5/5)



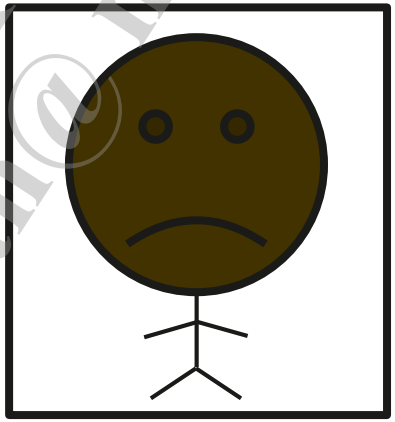
Strength = 8 (Strong)

Skin Protection (1/5)



Input

Dark scene
→ Skin luma enhanced



Bright scene
→ Skin luma reduced

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Skin Protection (2/5)

- Concept
  1. Detect skin color by HSY of each pixel.
  2. Set weighting of skin protection for blocks.

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Skin Protection (3/5)

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Skin Protection (4/5)

CA-LTM ON, w/o Skin Protection

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Skin Protection (5/5)

SkinWeight : 10

CA-LTM ON, w/ Skin Protection

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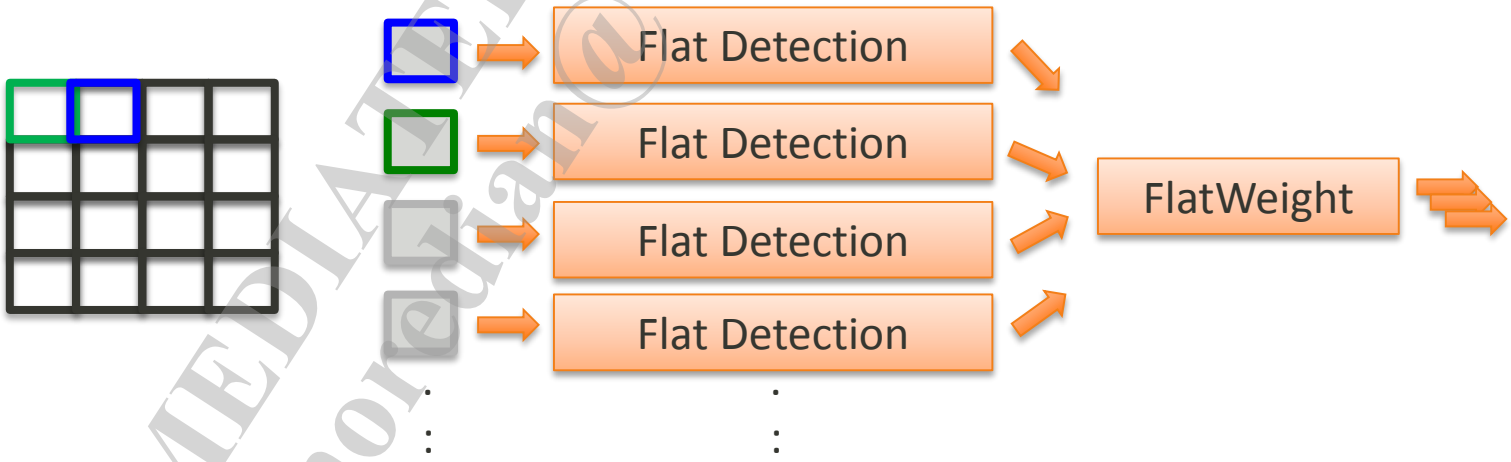
Flat Region Protection (1/4)

- Concept
  1. Detect small difference of neighboring pixel as “flat region”.
  2. Set weighting of flat region protection for blocks.



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Flat Region Protection (2/4)

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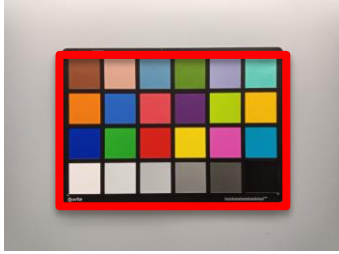
Flat Region Protection (3/4)



CA-LTM ON, w/o Flat Region Protection

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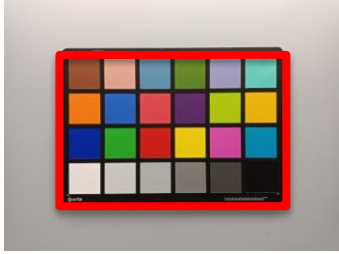
Flat Region Protection (4/4)



CA-LTM ON, w/ Flat Region Protection

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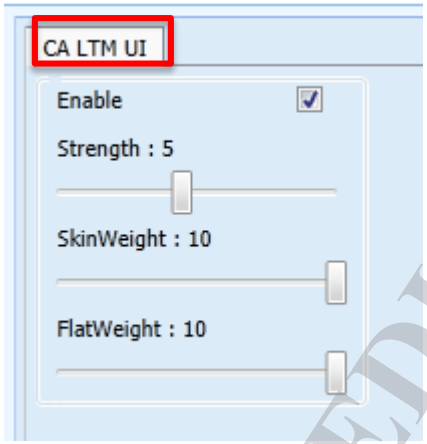
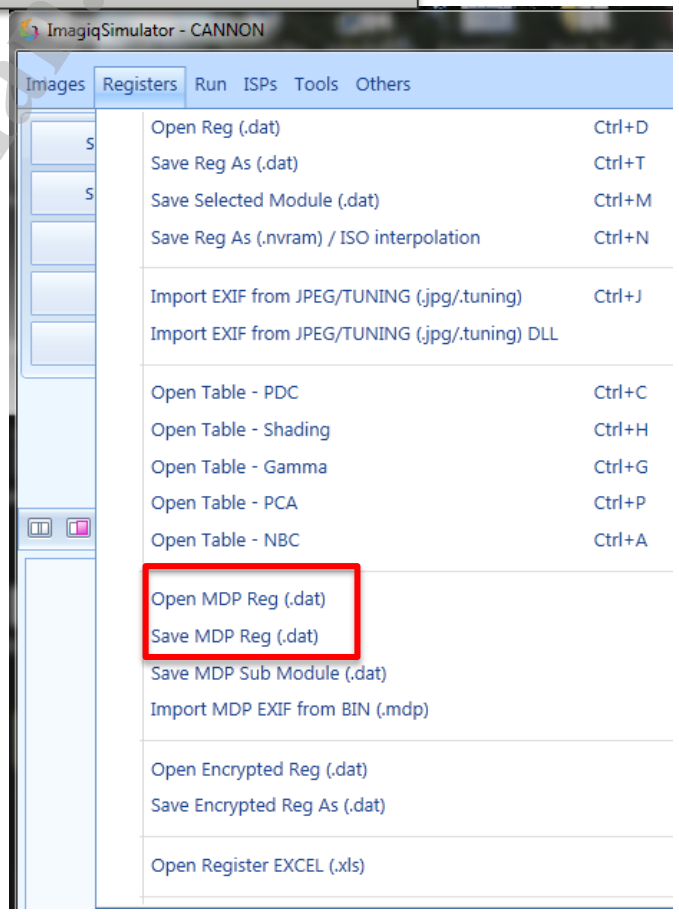
Imagiq Simulator

調整彈性
弱到強分成10組
1. Strength 0 ~10
2. Flat Weight 0~10
3. Skin Weight 0~10



儲存/載入MDP Reg



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