



# ICC Color Symposium

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## Soft Proofing Revisit and Reborn 軟打樣的重生

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Organizers



# Overview 概覽

- What is Soft Proofing?
- What is needed for Soft Proofing?
- Why monitor is important?
- How to choose a good monitor?
- 什麼是軟打樣?
- 軟打樣需要什麼?
- 為何螢光幕是這麼重要?
- 如何選擇良好的螢光幕?

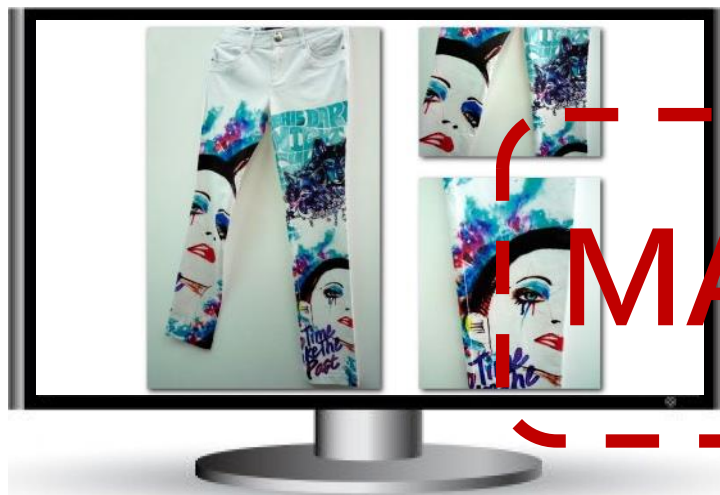


# What is Soft Proofing?

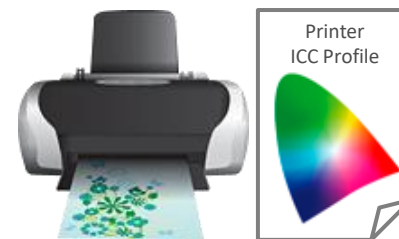
## 什麼是軟打樣？







**MATCH**



# What is the Advantage of Soft Proofing?

## 軟打樣的優點是什麼？

No **Guesswork** Anymore!

- You can get a good estimation of what will come out from the printer.
- Avoid unexpected result from mass production.
- Save time and consumables.
- Good solution for global collaboration.

無需再**猜測**！

- 您可以容易預測印刷效果
- 避免大規模生產的意外結果
- 省時及省物料
- 全球協作的良好解決方案





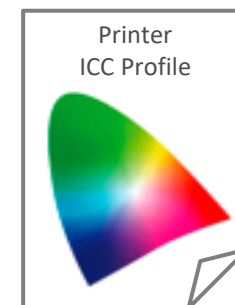
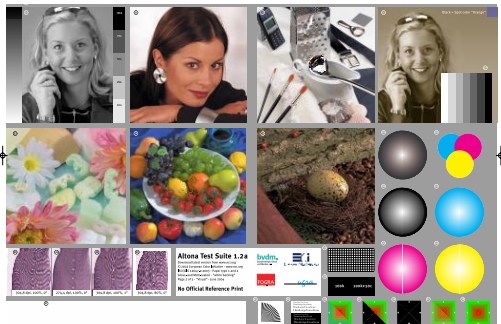


What is Needed for  
Soft Proofing?  
軟打樣需要什麼？



# Checklist 清單:

1. Have an electronic version of the artwork ready.
  2. Have a **stable printer** to print out the artwork.
  3. Have the **ICC profile** for the correct **printer, ink set, and paper combination**.
1. 準備好電子版的稿件
  2. 有一個**穩定的打印機**打印稿件
  3. 需要有正確的**打印機、墨水**和**紙張組合**的**ICC特性檔**。





# Checklist 清單:

4. Have a **standard viewing condition** ready.
  - Viewing booth with **D50** is preferred.
5. Have a **calibrated monitor** ready.
  - Calibrated to the light source in the viewing booth.



4. 需要準備**標準的觀色狀態**
  - 建議**D50**的燈箱
5. 需要準備一個**已校準的螢光幕**
  - 校準至燈箱的光源







## Checklist 清單:

6. Open soft proofing application with printer ICC profile applied.

- Acrobat
- Photoshop
- Other soft proofing software

6. 開啟具有打印機 ICC特性檔的軟打樣軟件

- Acrobat
- Photoshop
- 其他軟打樣軟件

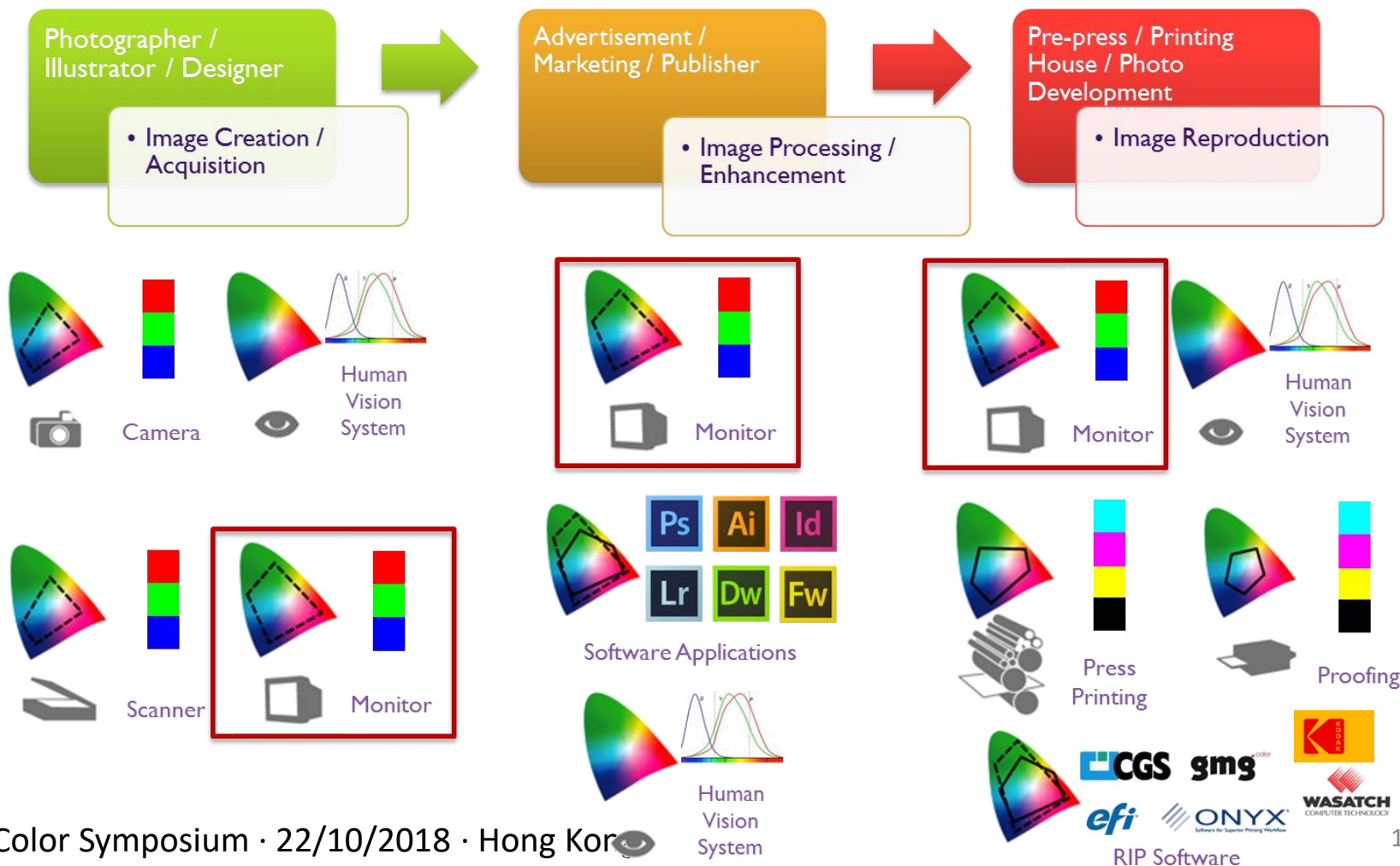
# Importance of the Monitor 螢光幕的重要性





# Color Management Workflow

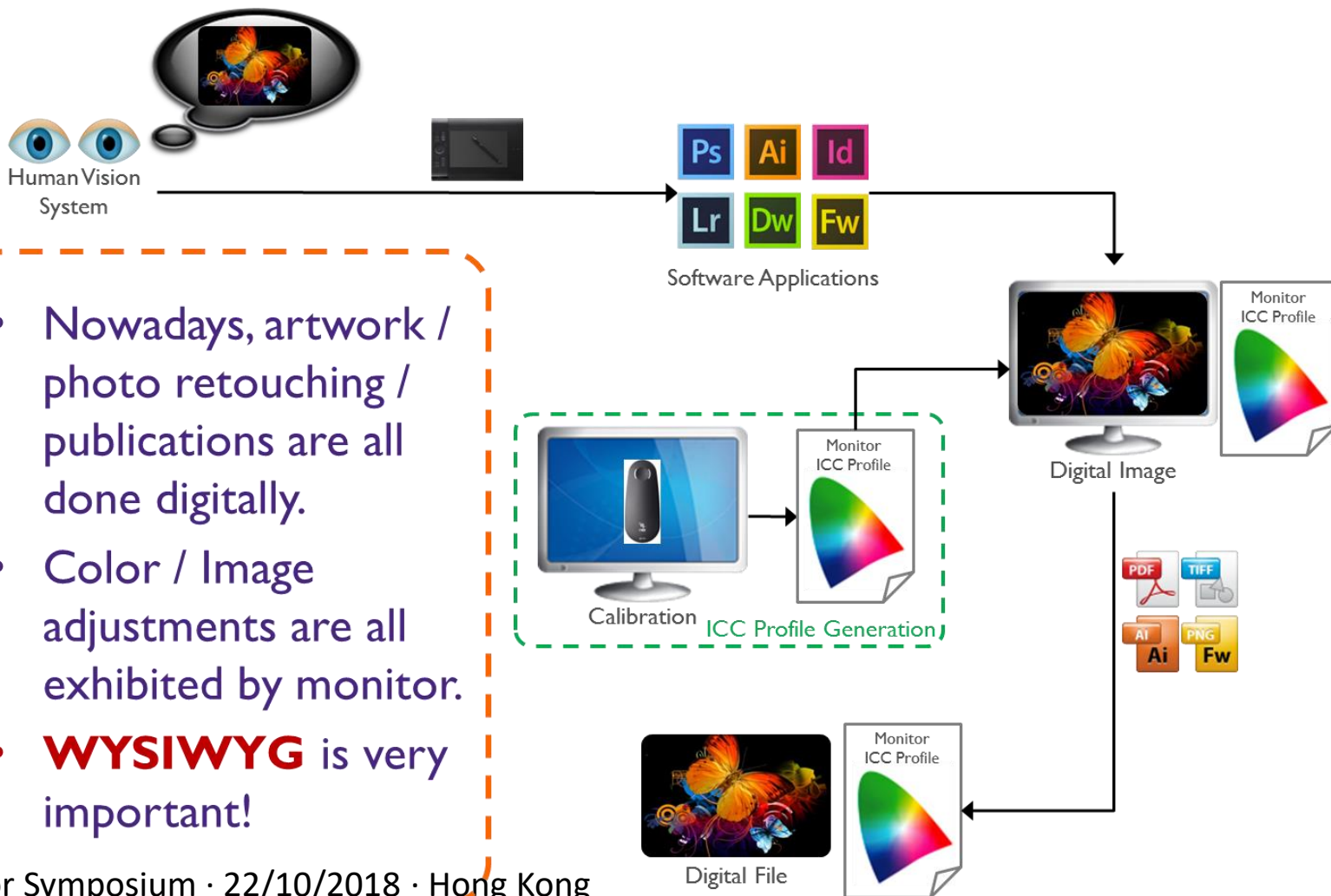
## 色彩管理流程





# Why do We Need an Accurate Monitor?

## 為何我們需要一個準確的螢光幕？





# Expectations...

## 預期 ...

Same Photo on  
Different Monitors  
在不同螢光幕的同一  
張相



Which one is  
correct?  
哪個是正確？



# Why are Colors Different on Monitors?

## 為何在螢光幕上的顏色會不同？

- Colors appeared differently not only for human eyes, but also on monitors, printed papers, camera images, and all sort of imaging display / capture / reproduction systems.

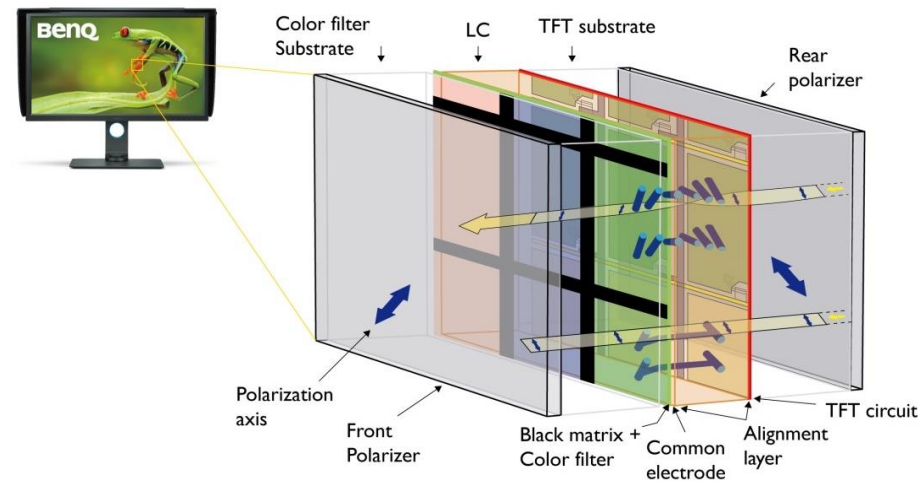
顏色不僅對人眼而且在顯示器、印刷紙、相機圖像以及各種成像顯示/獲取/重現系統上都有所不同

- Components affecting color for monitors 影響螢光幕顏色的原素：

- Backlight 背光
- Color Filter 顏色過濾器
- LC Layer
- Glare type or Non-Glare 閃或不閃
- Polarizer 偏光鏡

- Mass production variation contributes the most variation in color performance.

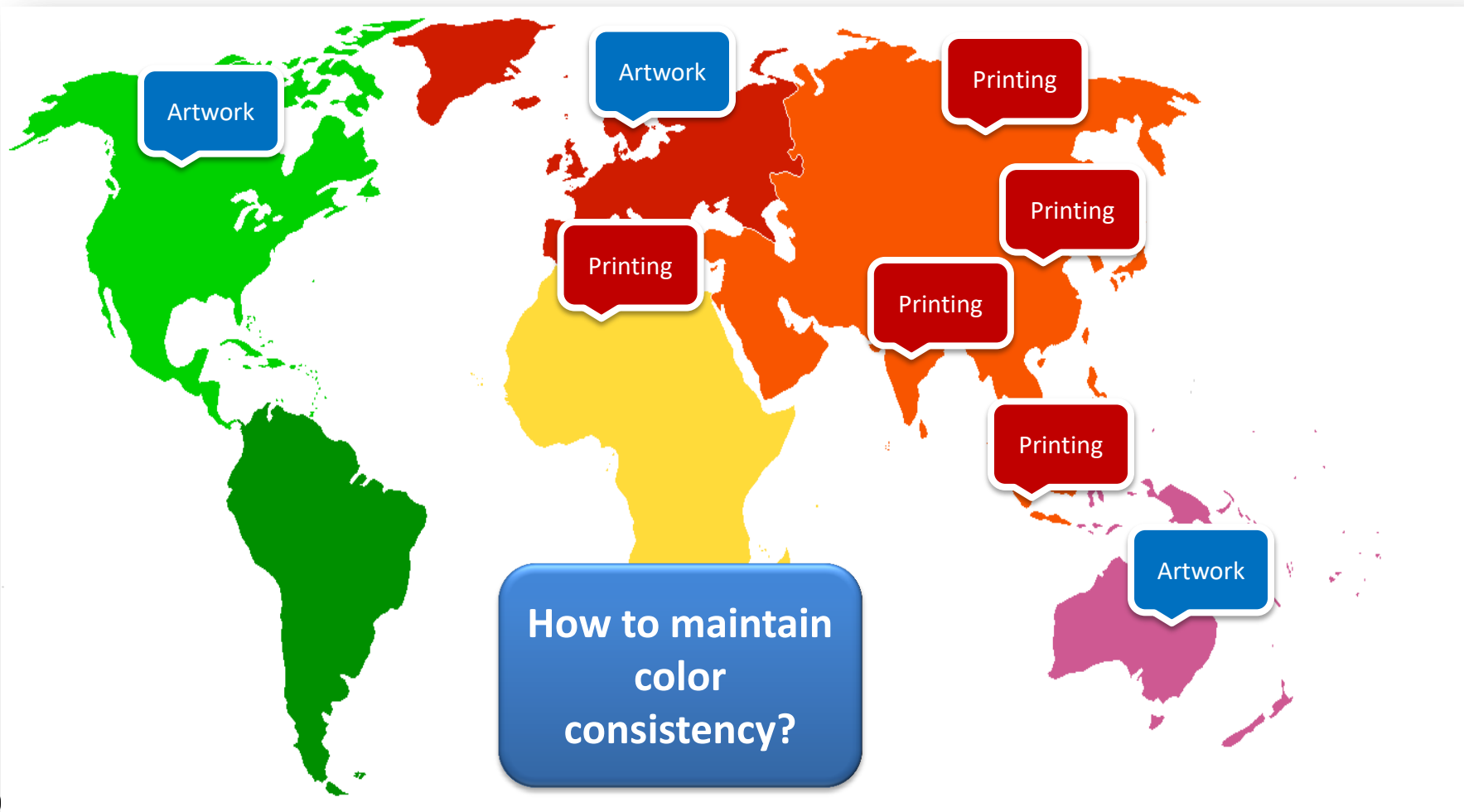
大量生產變化對顏色表現的影響最大





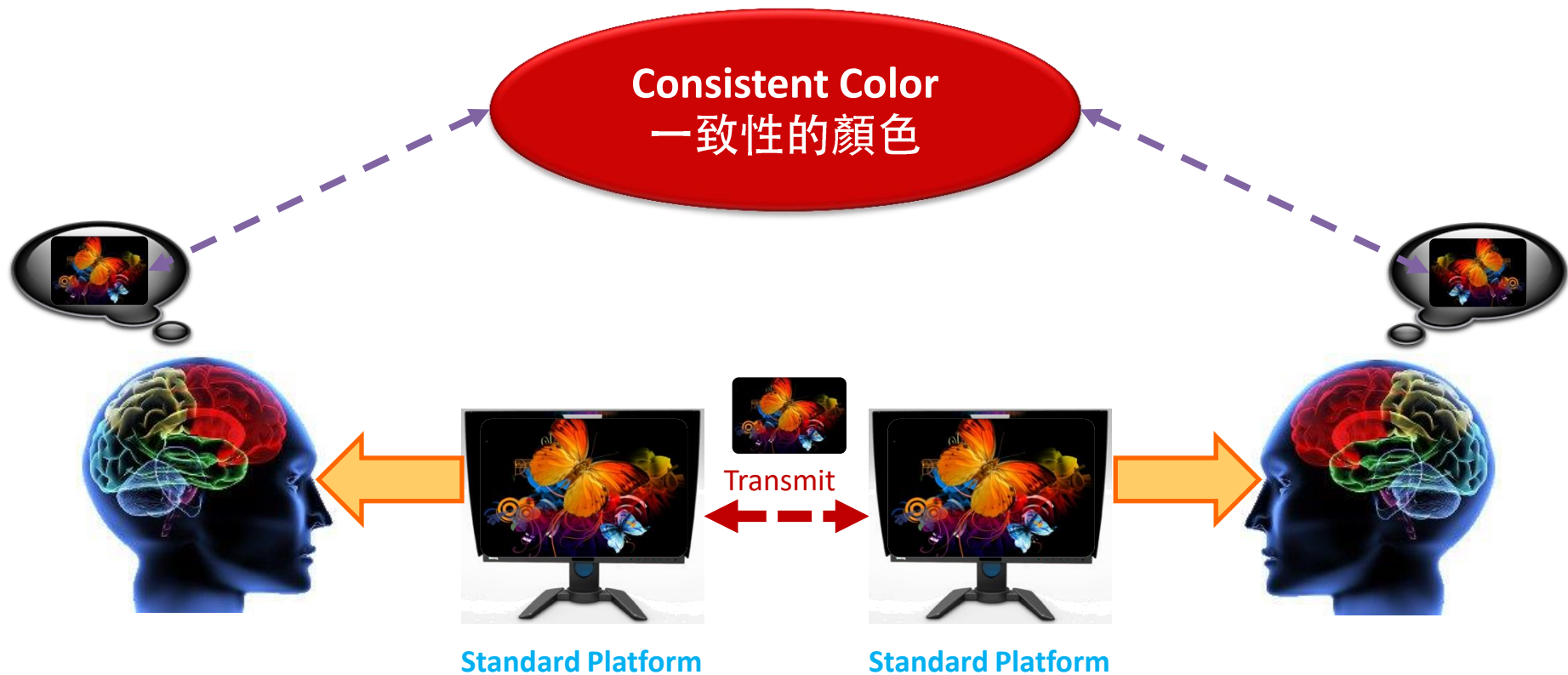
# Global Collaboration

## 全球的合作





# Standard Platform 標準平台



# What is Monitor Calibration?

## 什麼是螢幕校準

- Monitor Calibration associated with 與螢幕校準相關:
  1. To define a set of targets for the monitor to achieve.  
為螢光幕定義一系列的目標
  2. To adjust the monitor to match the set targets.  
調整螢光幕以達至已設定之目標
- For example, we would like to match the images viewed under the viewing booth, then we need to:  
例如，我們希望在燈箱下匹配觀看的圖像，我們就需要：
  1. Know the **color of the light (color temperature, luminance, etc.,...)** from the viewing booth.  
從燈箱中了解**光的顏色（色溫、亮度等）**
    - 5000K, 160 cd/m<sup>2</sup>
  2. Adjust the monitor to the specified color light.  
將螢光幕調整到指定的顏色光源







# What do We Need? 我們需要什麼？



BenQ PV270 &  
Palette Master Software



Datacolor  
Spyder 5



X-Rite i1 Pro 2



X-Rite  
i1 Display Pro



# Before Calibration 校準前







# After Calibration 校準後

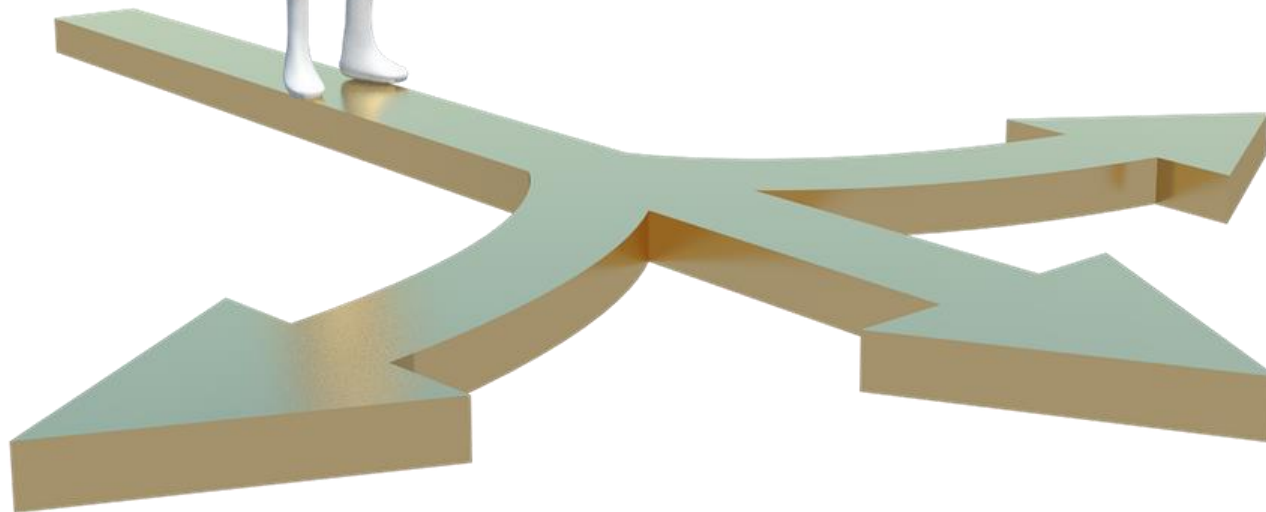






# Choosing a Good Monitor

## 選擇一個良好的螢光幕

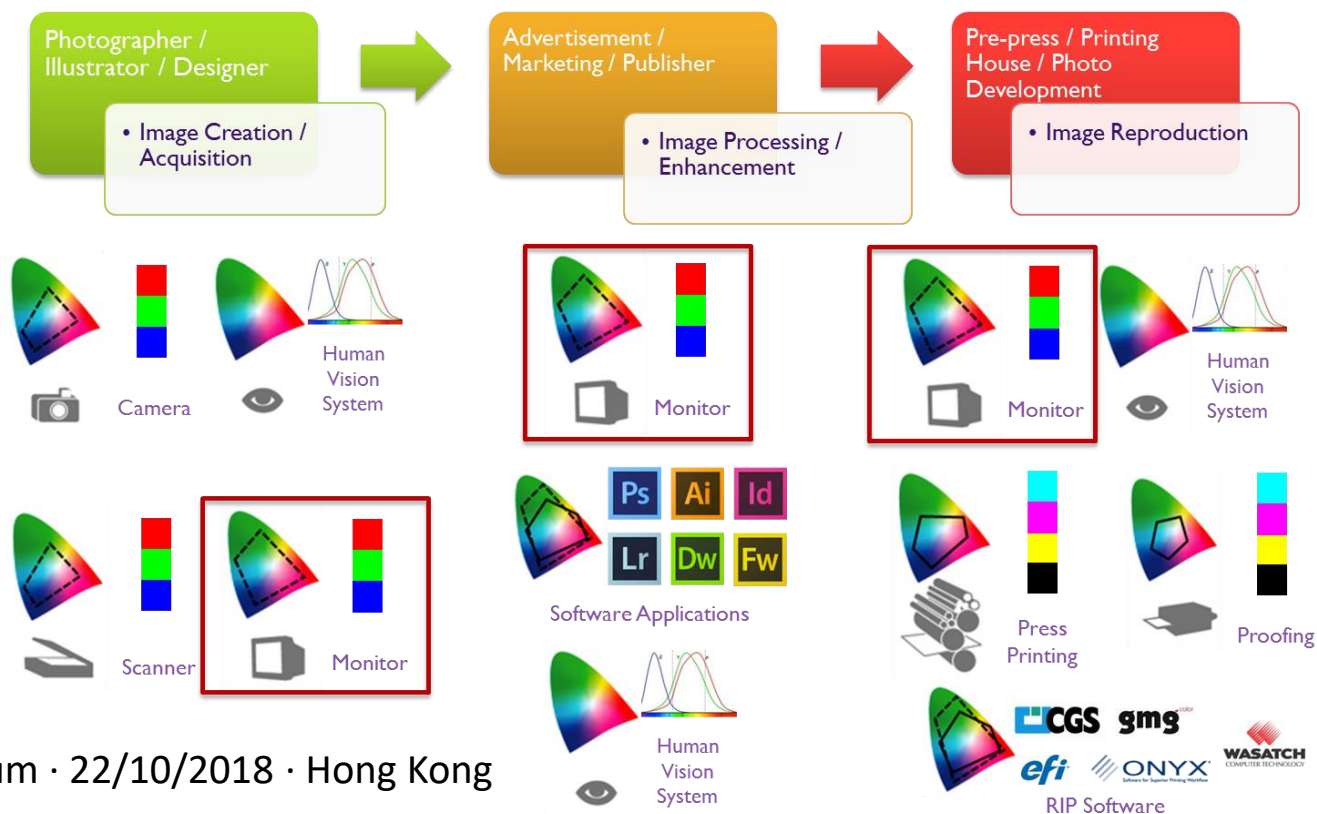


# What Monitor to Look for?

## 選擇什麼螢光幕？

Color Management Monitor should be utilized where color critical work is conducted.

在進行顏色關鍵工作的時候應使用色彩管理螢光幕。



# What Monitor to Look for?

## 選擇什麼螢光幕？

### Color Management Monitor 色彩管理螢光幕：

- Able to be calibrated accurately by instrument (measuring devices).  
能夠通過儀器（測量設備）精確校準
- Conforms to industrial standards so the monitor fits easily into the workflow.  
符合工業標準，因此螢光幕可容易地適合工作流程
- Stable over useful time periods.  
在有用的時段內保持穩定

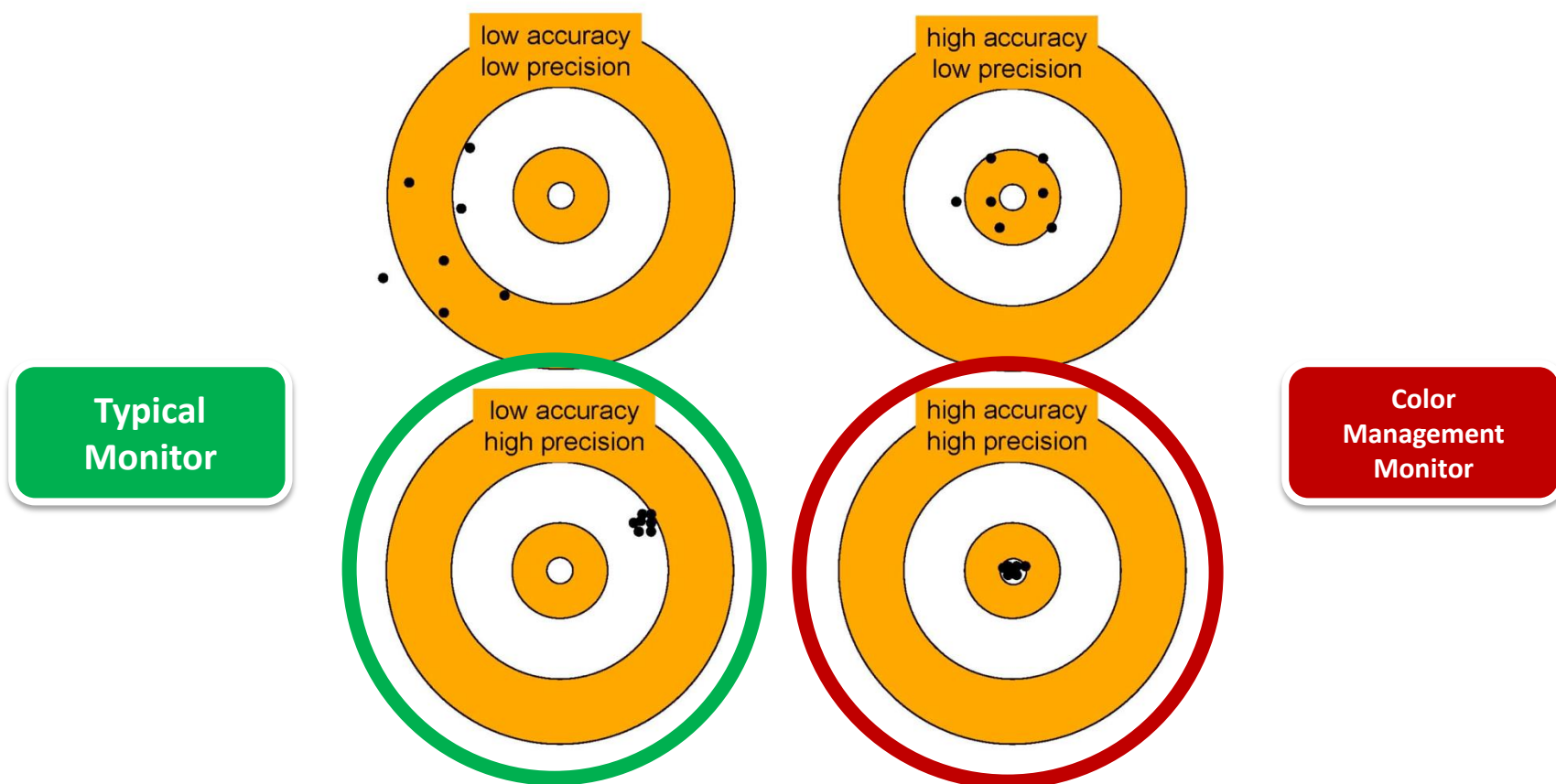






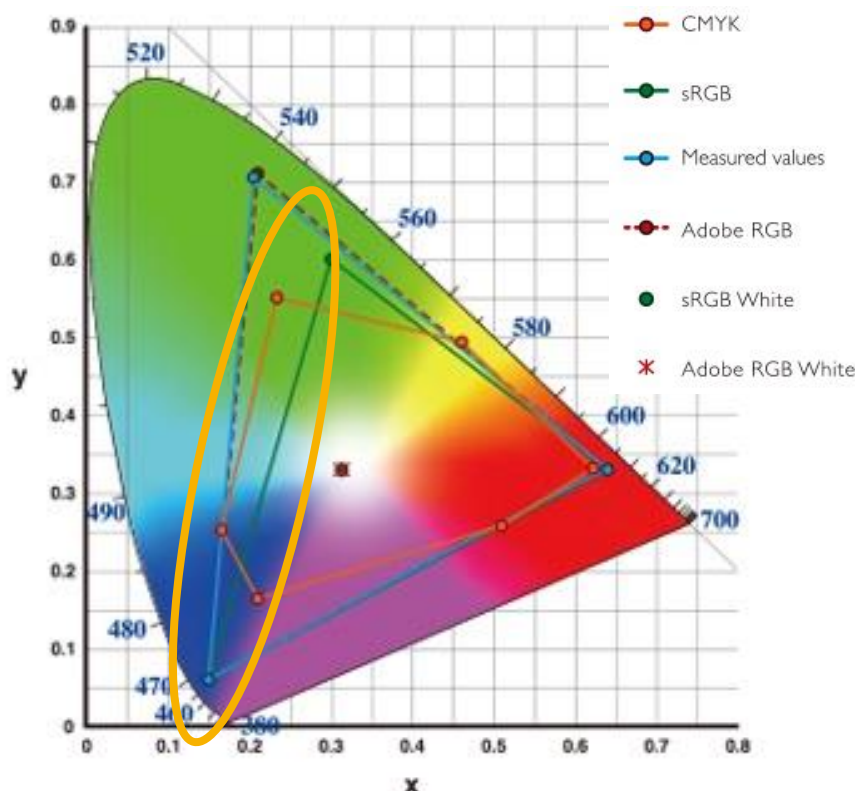
# What are We Looking for?

## 我們找尋什麼？



# Must Have's... 一定需要...

## 1. Adobe RGB Color Gamut:



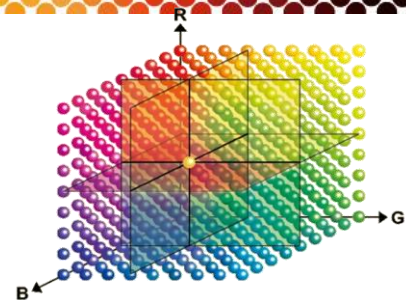
sRGB is a standard for **monitors**, digital camera, scanners. However, most monitors in the market today **DOES NOT** cover 100% sRGB.

sRGB是**螢光幕**、數碼相機、掃描儀的標準。但是，目前市場上的大多數螢光幕都**不能**覆蓋100% sRGB

Adobe RGB is designed to cover **CMYK press** colour gamut, and extending into green and cyan area. Best for press printing.

Adobe RGB旨在覆蓋**CMYK印刷**色域，並擴展到綠色和青色區域，最適合印刷。

# Must Have's... 一定需要...



## 2. Hardware Calibration Capability:

- Two types of calibration are available for displays:

### 1. S/W calibration is heavily depended on graphics card.

- Using a **high-end graphics card** delivers good performance.
- On-board graphics card delivers only mediocre performance.
- Do **NOT** have consistent performance across different units.

### 2. H/W calibration performance is not limited by graphics card.

- More parameters could be adjusted.
- Finer adjustments could achieve more accurate result.

## 2. 硬件校準能力：

- 有兩種螢光幕校準可供使用

### 1. 軟件校準在很大程度上取決於圖像顯示咭

- 使用**高端顯示咭**可提供良好的表現
- 板載顯示咭只提供平庸的表現
- 在不同螢光幕之間**不能**保持一致的表現

### 2. 硬件校準表現不受圖像顯示咭限制

- 可以調整更多參數
- 更精細的調整可以獲得更準確的結果

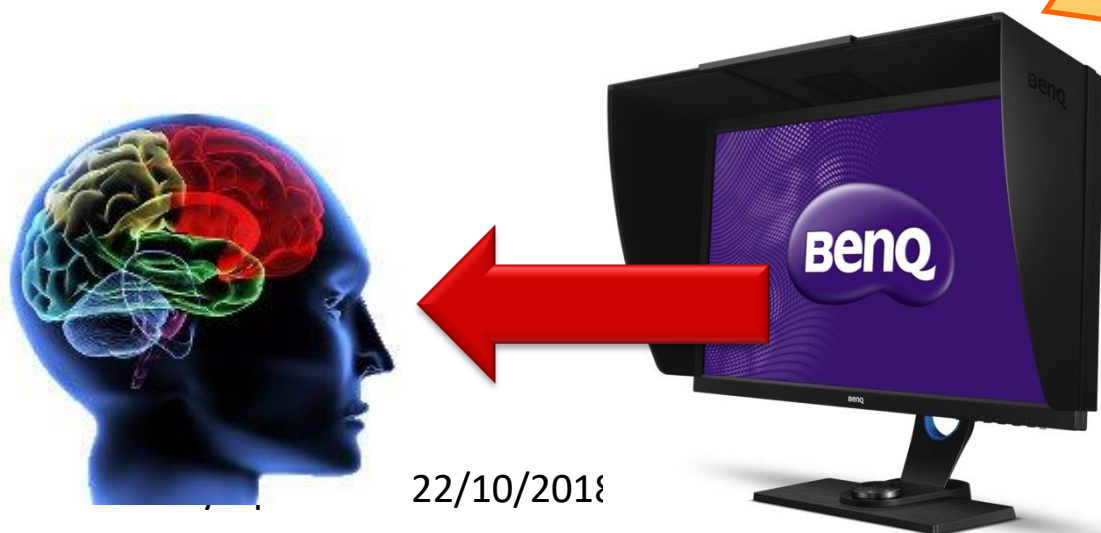


# Must Have's... 一定需要 …

## 3. Shading Hood 遮蓋罩：

- Minimize the effect from ambient light which impacts the color reproduction.

將環境光對色彩重現的影響減至最低



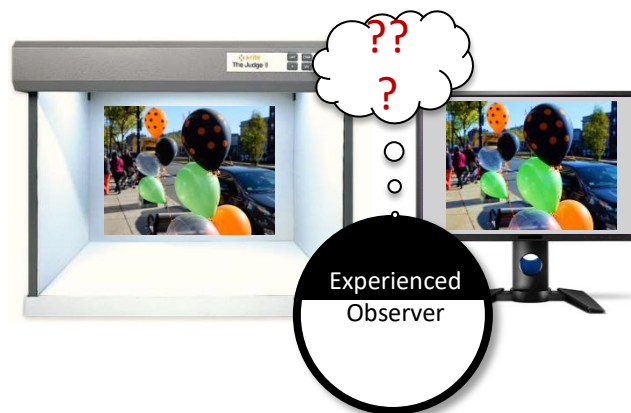
# Beyond the Standard

## 超越標準

When BenQ 1<sup>st</sup> LED backlight color management monitor was announced.

當BenQ第一款LED背光色彩管理螢光幕發佈時

- Very exciting news!  
令人興奮的消息!
- Experienced users found out LED backlight monitor did not performed well in soft proofing scenario.  
有經驗之用家發覺LED背光螢光幕不能在軟打樣中有良好的表現



# Symptoms 徵兆

- Variations in blue, green and pale yellow tones, for example.

例如在藍、綠、淡黃色調的變化

- Difference in perceived saturation.

所見的飽和度不同

Overall  
saturation is  
different



Viewing Booth  
(Simulated)



LED Backlight Monitor  
(Simulated)

Slight hue  
shift in blue

Slight hue  
shift in green

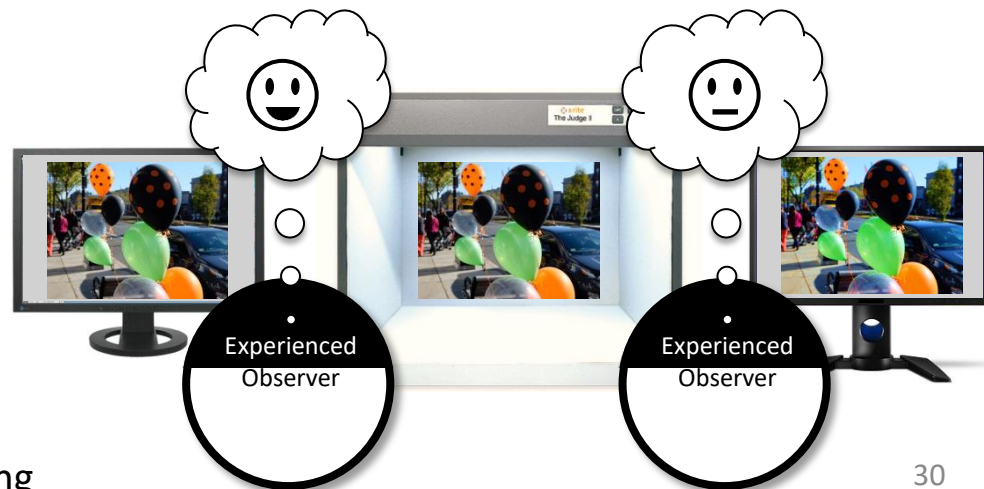
Slight hue shift  
in pale yellow



# Compared to CCFL 與CCFL之對比

- To clarify the problem presented, a CCFL reference monitor was used.  
要修正問題，需要使用一個CCFL參考螢光幕
- Sadly, experienced observers were happier about the match with CCFL monitor than LED monitor.  
可惜，有經驗的觀察員會比較喜歡使用CCFL螢光幕多於LED螢光幕

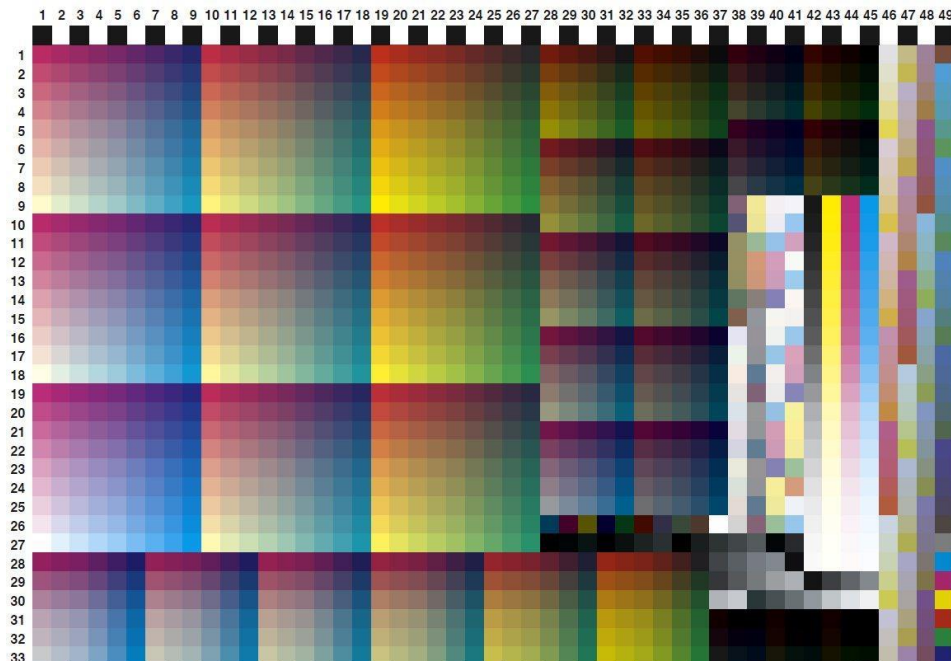
**\*\* CCFL: Cold cathode  
fluorescent lamp  
冷陰極螢光燈管**



# What Was Wrong? 有什麼問題?

$\Delta E_{00}^*$  is more or less the same...

$\Delta E_{00}^*$  是差不多相同 ...



Tested with IT8.7/4 1617 Patches:

- LED Monitor:
  - Avg.  $\Delta E_{00}^* = 1.25$
  - Max.  $\Delta E_{00}^* = 4.35$
- CCFL Monitor:
  - Avg.  $\Delta E_{00}^* = 1.20$
  - Max.  $\Delta E_{00}^* = 4.25$

Not much difference from the values alone.

# Observer Variations

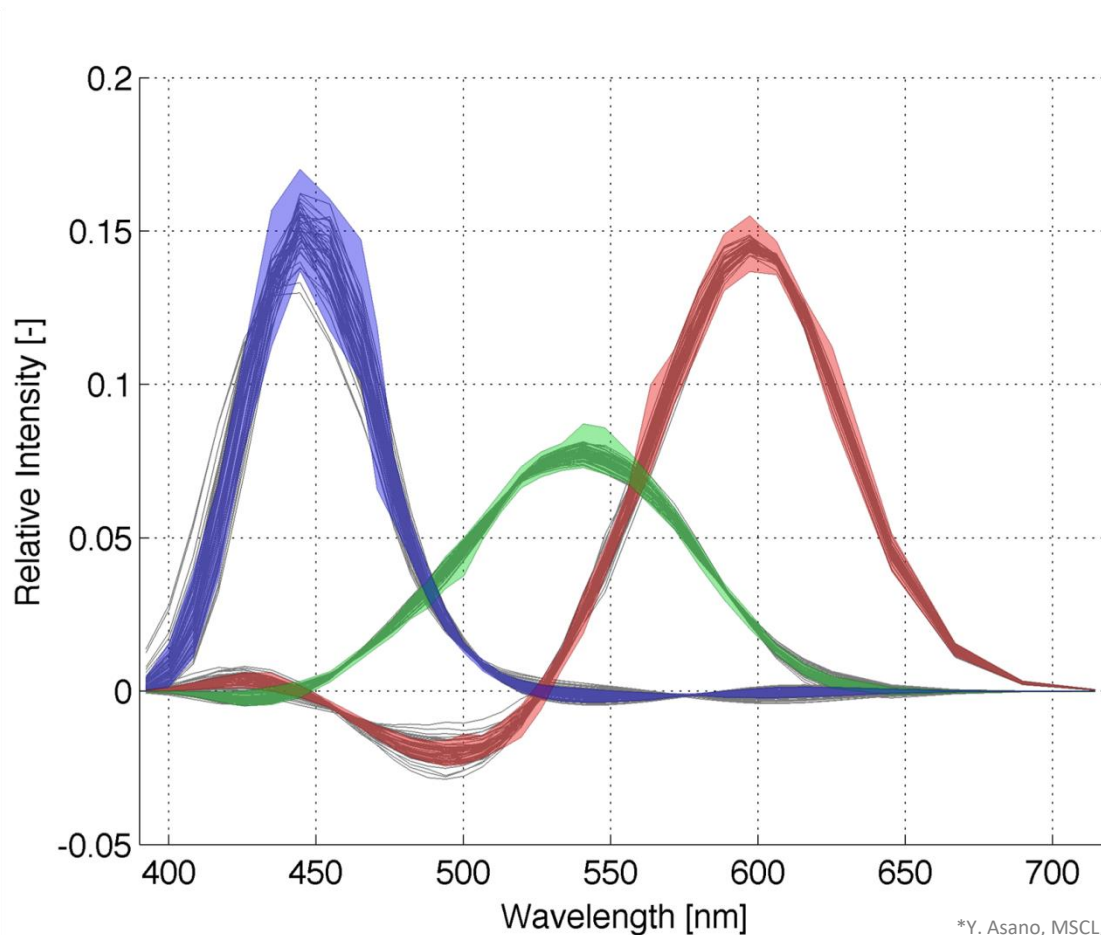
## 觀察員的變化

- CIE Report\* suggested:  
*“A potential practical solution is to implement an observer-dependent color imaging workflow at the device level. ... Conceptually this is similar to the device-dependent color imaging, a well-established color management concept.”*
  - But no spectral color management workflow was established at that time.
  - Only Standard Observer could be applied.
- CIE 報告\* 建議：  
*“一種潛在的實際解決方案是在設備上實踐依賴於觀察者的色彩成像工作流程。 .....從概念上說，這類似於依賴於設備的色彩成像，一種成熟的色彩管理概念。”*
  - 但當時沒有建立光譜色彩管理工作流程
  - 只能應用在標準觀察者



# Observer Variations

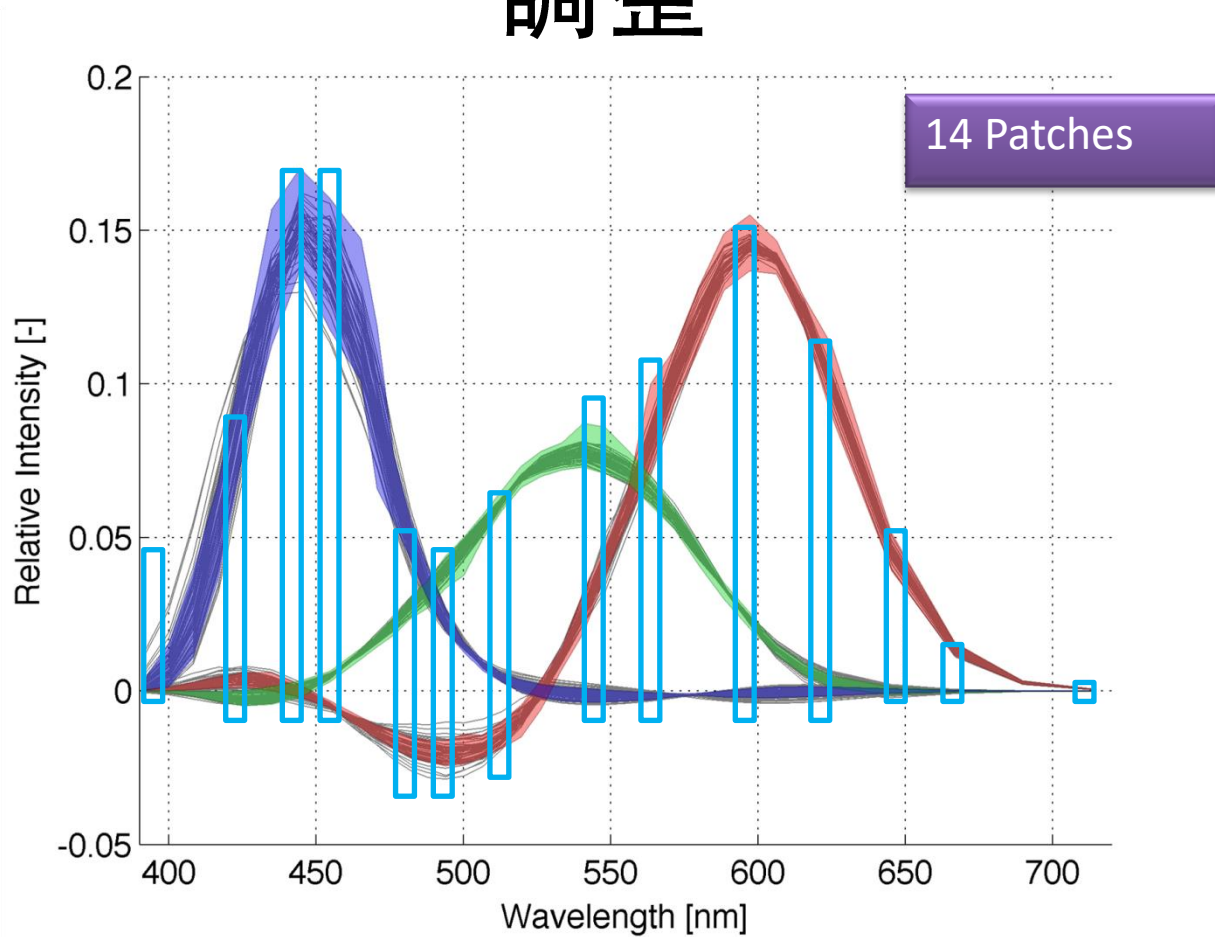
## 觀察員的變化



\*Y. Asano, MSCL, RIT, USA  
<http://www.cis.rit.edu/~yxa8513/Research.html>

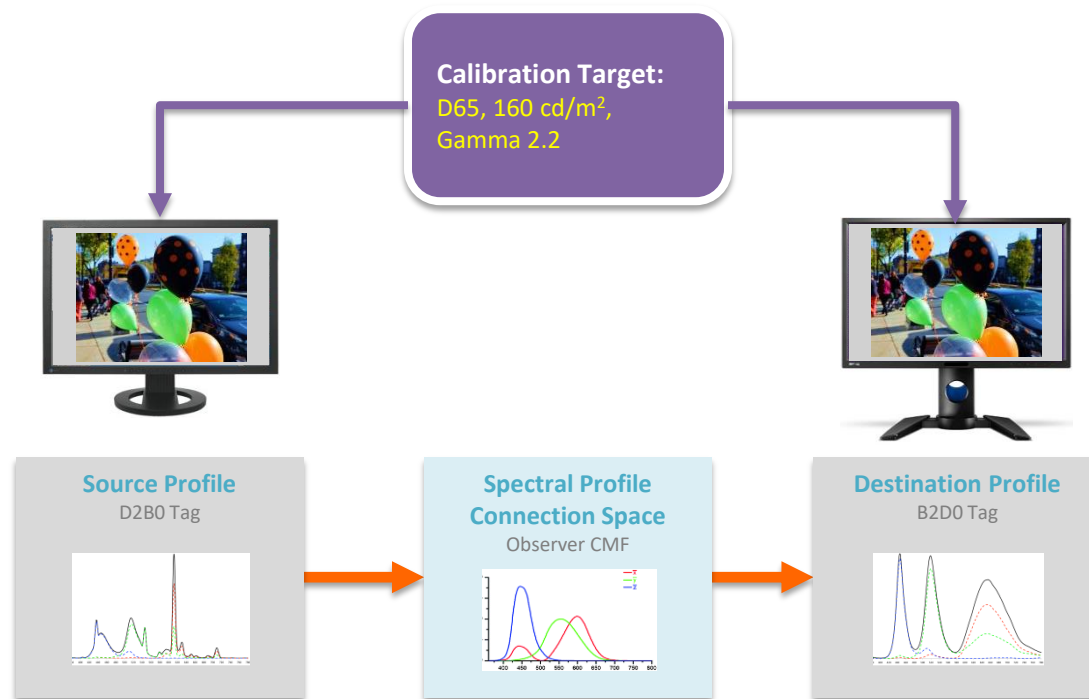


# Adjustment 調整



# iccMAX Workflow

## iccMAX 工作流程





# Test Images 測試圖



Test Image 1



Test Image 2



Test Image 3



Test Image 4



Test Image 5



Test Image 6



Test Image 7



Test Image 8



# Results 結果



Test Image 1



Test Image 2



Test Image 3



Test Image 4

BEFORE	No. of Acceptable	7	9	3	4
	No. of Unacceptable	5	3	9	8
	Rate of Acceptable	58.3%	75.0%	25.0%	33.3%
AFTER	No. of Acceptable	9	10	8	6
	No. of Unacceptable	3	2	4	6
	Rate of Acceptable	75.0%	83.3%	66.7%	50.0%
Improvement		+16.7%	+8.3%	+41.7%	+16.7%



# Images for One Observer

## 一位觀察員的圖像



Before



Before



Before



Before

Test Image 1



Original

Test Image 2



Original

Test Image 3

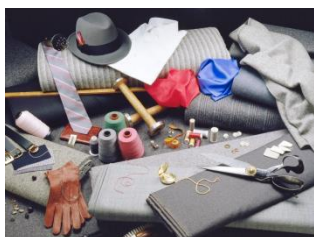


Original

Test Image 4



Original



After



After



After



After





# Conclusions

## 結論

- Improvement was shown after utilizing iccMAX workflow.
  - Blue and green tones
  - Saturated colors
- Some area still needs further investigation:
  - Pale and low brightness colors
  - Skin tone
  - Red tones
- Overall, with proper adjustment, iccMAX is the key to solve observer metamerism on narrow band emission devices.
- 使用iccMAX工作流程後，會顯示改變
  - 藍、綠色調
  - 飽和度高的顏色
- 有些地方仍然需要再跟進：
  - 淡及暗顏色
  - 膚色
  - 紅色調
- 總括而言，通過適當調整，iccMAX是解決窄頻傳播設備上觀察者同色異譜的關鍵。

# Conclusions

## 結論

- Explained soft proofing scenario and advantages.
- Explained what is needed for soft proofing.
- Explained why monitors are important, and how to choose a good one.
- Now is the age for soft proofing!
  - Technology is ready for soft proofing.
  - Graphic Arts industry has gone global.
- 解釋軟打樣方案和優點
- 解釋了軟打樣需要什麼
- 解釋了螢光幕重要的原因, 以及如何選擇一個良好的螢光幕
- 現在是軟打樣的時代!
  - 技術已準備好進行軟打樣
  - 印藝業已走向全球化

ICC is here to Help.

ICC 可以提供協助



Thanks for your attention!  
謝謝!

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