



Good luck in
the year of the tiger

壬寅虎年大吉



ISP-DEMOSAICKING (上)



食鱼者



202202



目 录

CONTENTS

01. CMOS成像基础

02. 算法原理精讲

03. 算法代码实现

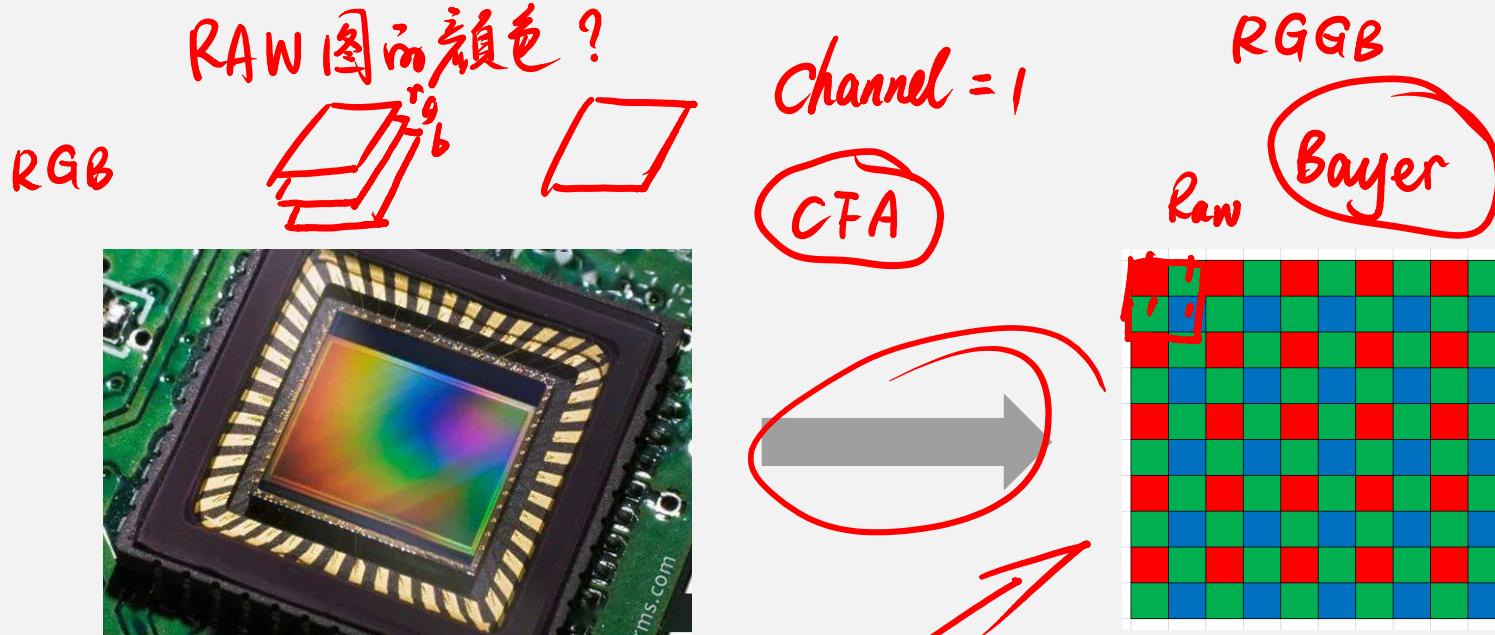


CMOS成像基础





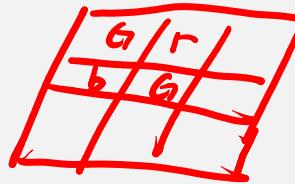
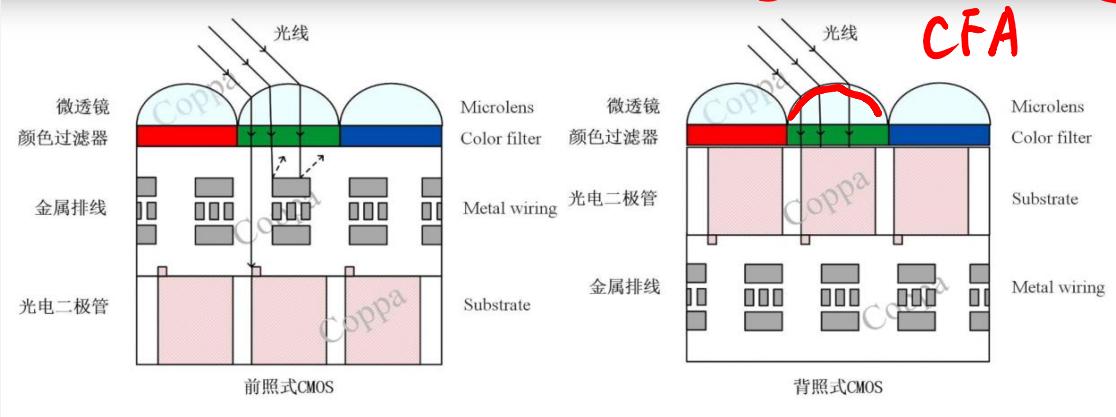
CMOS成像基础





CMOS成像基础

RGB
RG B
7色



raw →

伪彩色

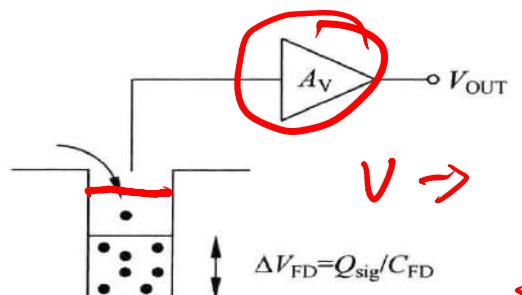
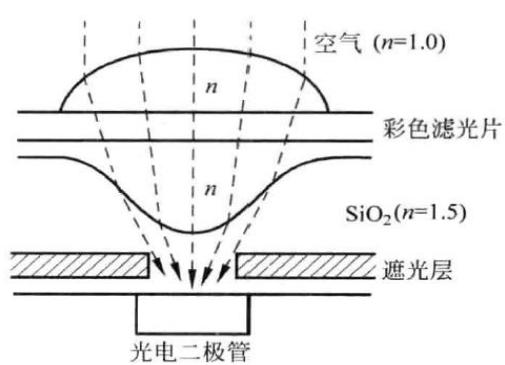
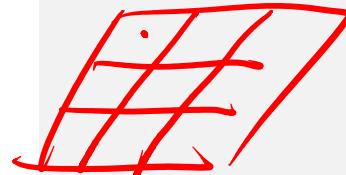
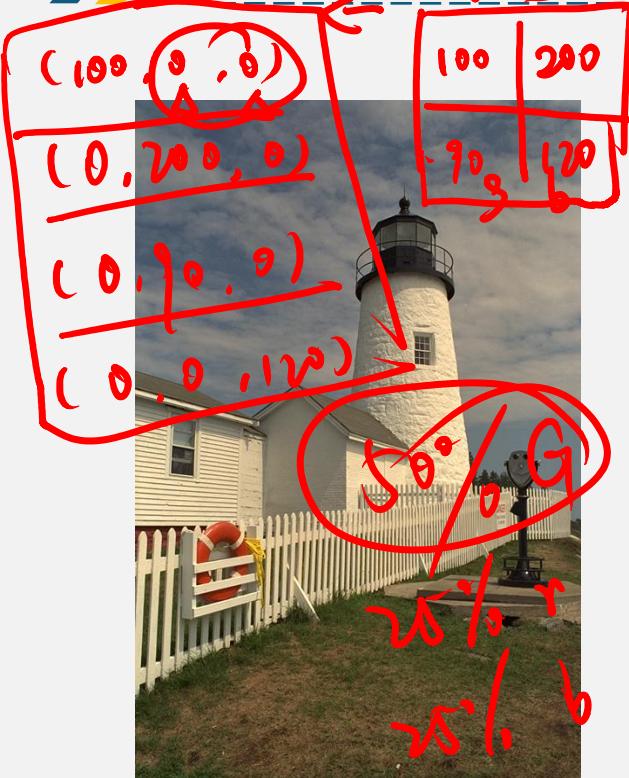


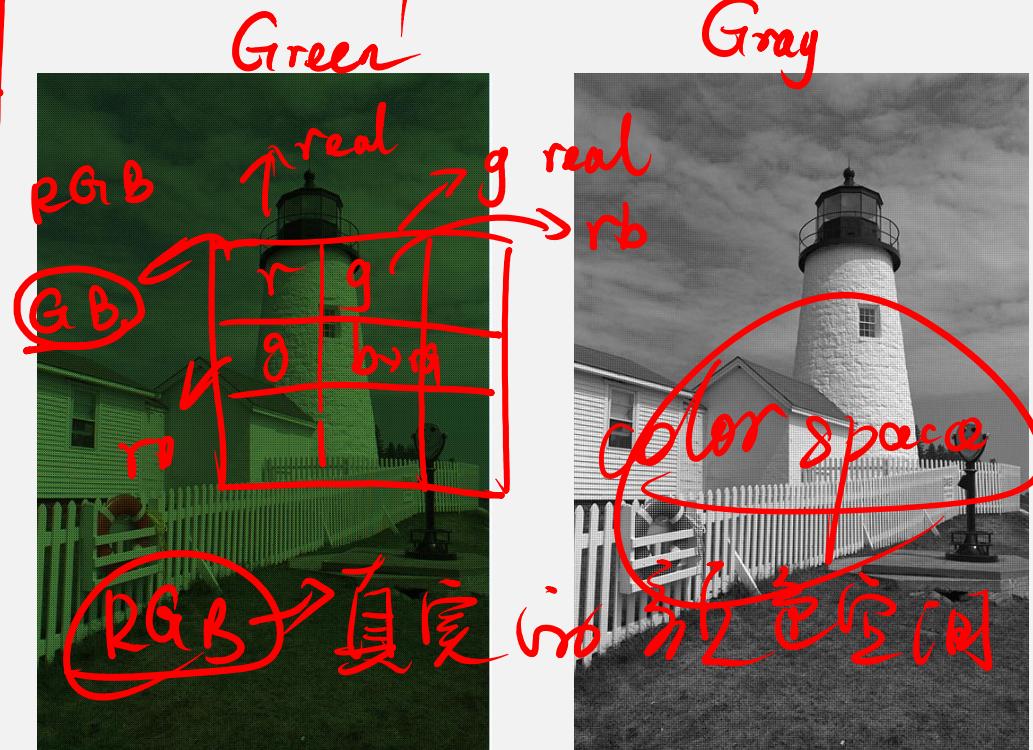
图 3.8 电荷检测电路



real g real b CMOS成像基础



close real
raw & TV



[RGB YUV] Y Y



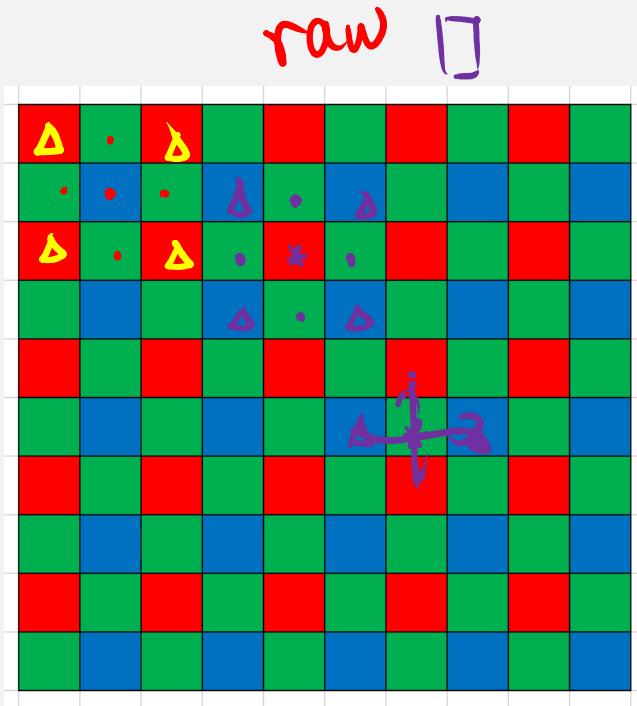
02

算法原理精讲



Bayer 格式

$$\text{pixel} = \begin{matrix} R \\ G \\ B \end{matrix}$$



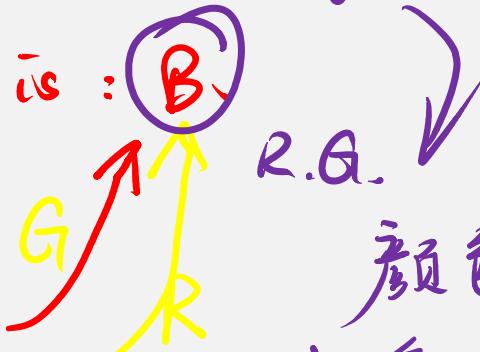
current point is : B

$$\text{need} = R, G,$$

$$\text{mean}(\sum_4 G)$$

$$\text{mean}(\sum_4 R)$$

current R.



$$\text{mean } \sum_4 G$$

$$\text{mean } \sum_4 R$$

$$(r, b)$$

$$\text{mean } (\sum_2 B)$$

$$\text{mean } (\sum_2 R)$$

线性插值方式

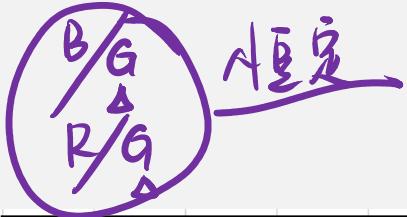
G →

$$\text{mean } (\sum_2 B)$$



算法精讲

贪心法



G1	R2	G3	R4	G5
B6	G7	B8	G9	B10
G11	R12	G13	R14	G15
B16	G17	B18	G19	B20
G21	R22	G23	R24	G25

占比恒定

① 插入G, $G \leq \text{属性}$

$$\textcircled{2} G_7 = \frac{B_7}{G_6 + B_8} = \Delta$$

$$G_{14} = \text{mean} \left(\frac{\sum \Delta}{4} \right)$$

$$G_{14} \rightarrow \left(\frac{B_8}{G_8} + \frac{B_{10}}{G_{10}} + \frac{B_{18}}{G_{18}} + \frac{B_{20}}{G_{20}} \right) / 4$$

算法精讲 色差法

① $G \leftarrow$ 线性插值. G 上的 $B, R \in$

$$B_{33} - \boxed{G_{33}} = \frac{(B_{32} - G_{32}) + (B_{34} - G_{34})}{2}$$

G_{11}	B_{12}	G_{13}	B_{14}	G_{15}
R_{21}	G_{22}	R_{23}	G_{24}	R_{25}
G_{31}	B_{32}	G_{33}	B_{34}	G_{35}
R_{41}	G_{42}	R_{43}	G_{44}	R_{45}
G_{51}	B_{52}	G_{53}	B_{54}	G_{55}

② R 上的 $G, B \Rightarrow G_{m,n}$

$$G_{m,n} = \frac{G_{m,n+1} + G_{m,n-1}}{2} + \frac{R_{m,n-2} + 2R_{m,n} - R_{m,n+2}}{8}$$

$$\left[\frac{R_{m,n} - R_{m+2}}{2} + \frac{R_{m,n} - R_{m,n-2}}{2} \right] / 2 = \overline{R_m} \quad \Delta$$

R 上的 B : $\text{mean} [\sum (B_i - G_i)]$

$$B_G = R = G, B$$

B 上的 R \odot



03

算法代码实现





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<https://gitee.com/wtzhu13>



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See You !