Bayer Pattern

- Invented by E. Bayer at Kodak in 1976, it is a way to arrange RGB filter on a squared grid of photosensors
- 50% green, 25% red, 25% blue
- mimic eye’s greater sensitivity to green wavelengths
- need *demosaicing* to interpolate the color information from neighbor units

Demosaicing

• Reproduce the original image
• Avoid artifacts
• Often must be efficient

1. Simple nearest neighbor, take the missing colors from the nearest pixel

\[
\begin{align*}
R_{11} & = R_{11} & R_{12} & = R_{13} \\
G_{11} & = G_{12} & G_{12} & = G_{12} \\
B_{11} & = B_{22} & B_{12} & = B_{22} & \ldots \text{etc}
\end{align*}
\]

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2 Bilinear interpolation

\[ R_{22} = 0.25 \cdot (R_{11} + R_{13} + R_{31} + R_{33}) \]
\[ G_{22} = 0.25 \cdot (G_{12} + G_{21} + G_{23} + G_{32}) \]
\[ B_{22} = B_{22} \]

\[ R_{25} = 0.5 \cdot (R_{15} + R_{35}) \]
\[ G_{25} = G_{25} \]
\[ B_{25} = 0.5 \cdot (B_{24} + B_{25}) \]

3 More sophisticated methods to reduce artifacts (but computationally more expensive)...

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