Computer Graphics

Lecture 2: Imaging, Radiometry, Photometry

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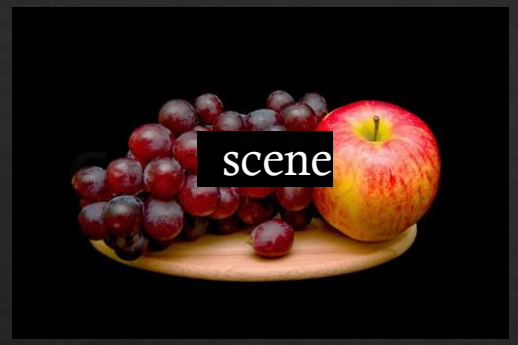
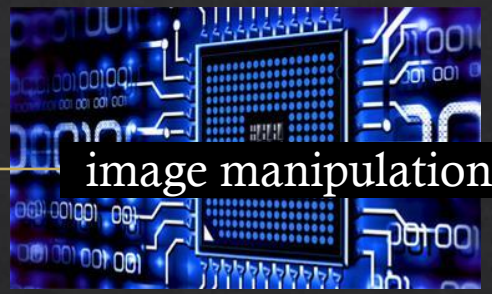
informatics

The big picture!

Real

photography



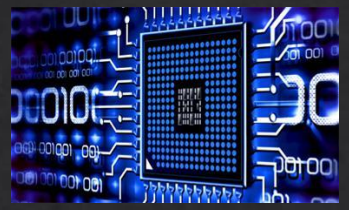


Human
visual system

rendering

Virtual

Energy in the scene

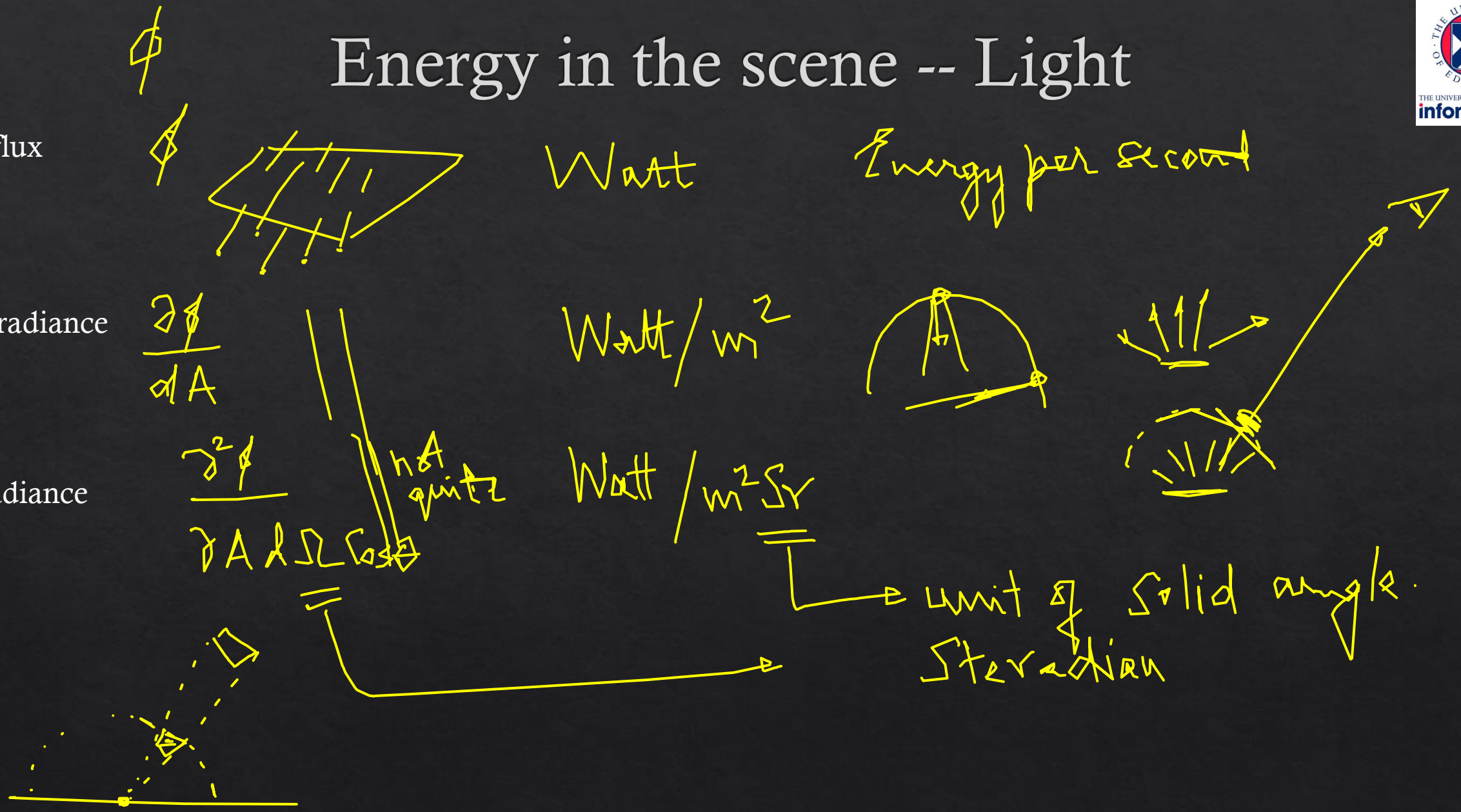


Energy in the scene -- Light

flux

irradiance

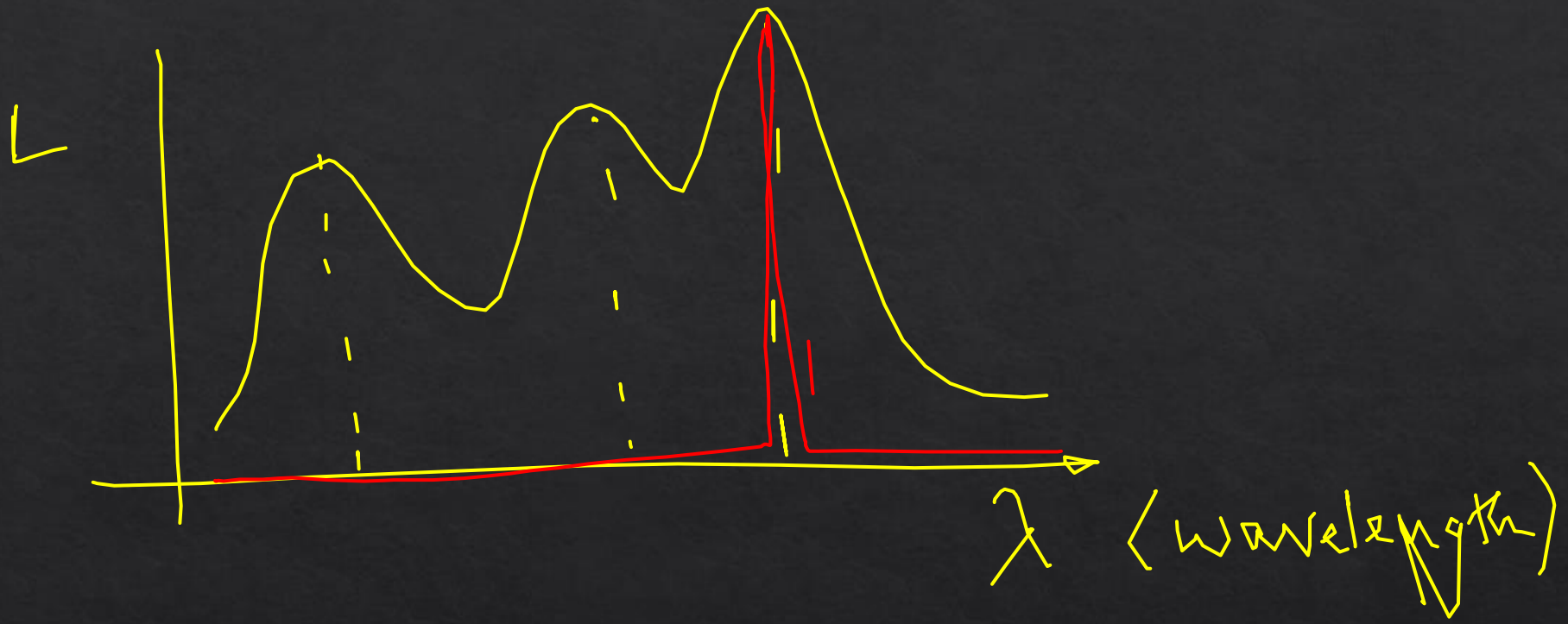
radiance



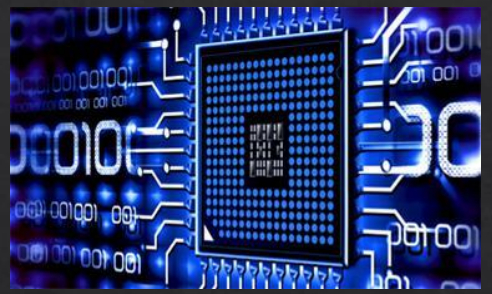
Energy in the scene -- Radiometry

Radiance : key

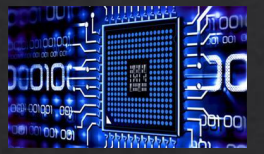
Energy in the scene -- colour



The big picture!



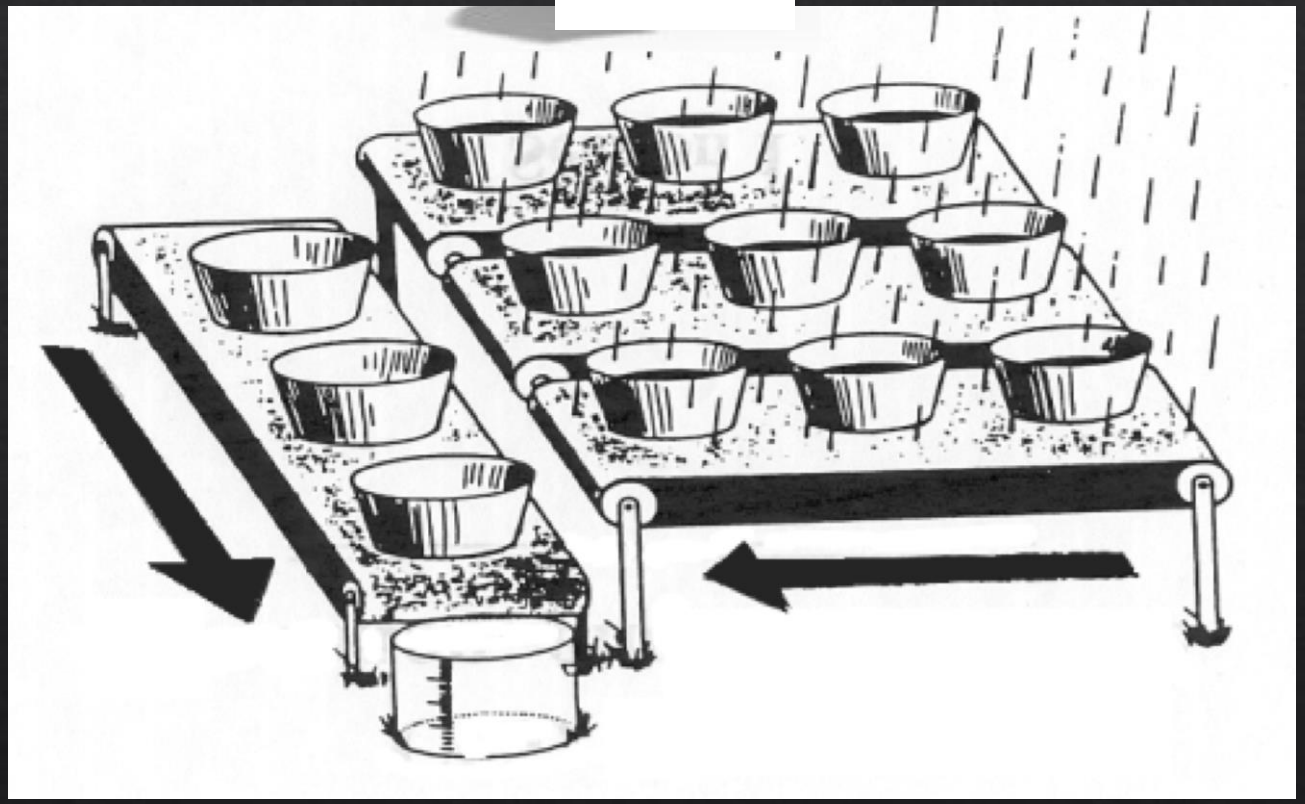
Cameras



Cameras – thin lens

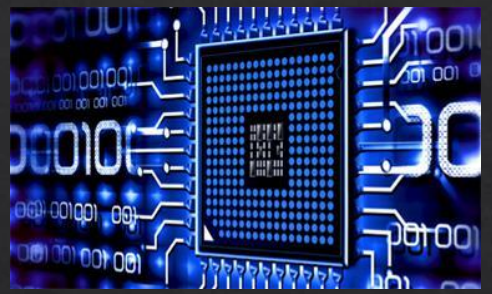
https://graphics.stanford.edu/courses/cs178-10/applets/thinlens.html

Cameras – sensors

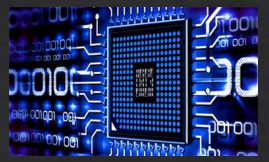


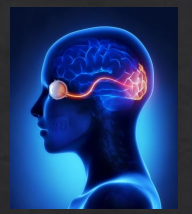
https://www.visiononline.org/userassets/aiauploads/file/cvp_the-fundamentals-of-camera-and-image-sensor-technology_jon-chouinard.pdf

The big picture!



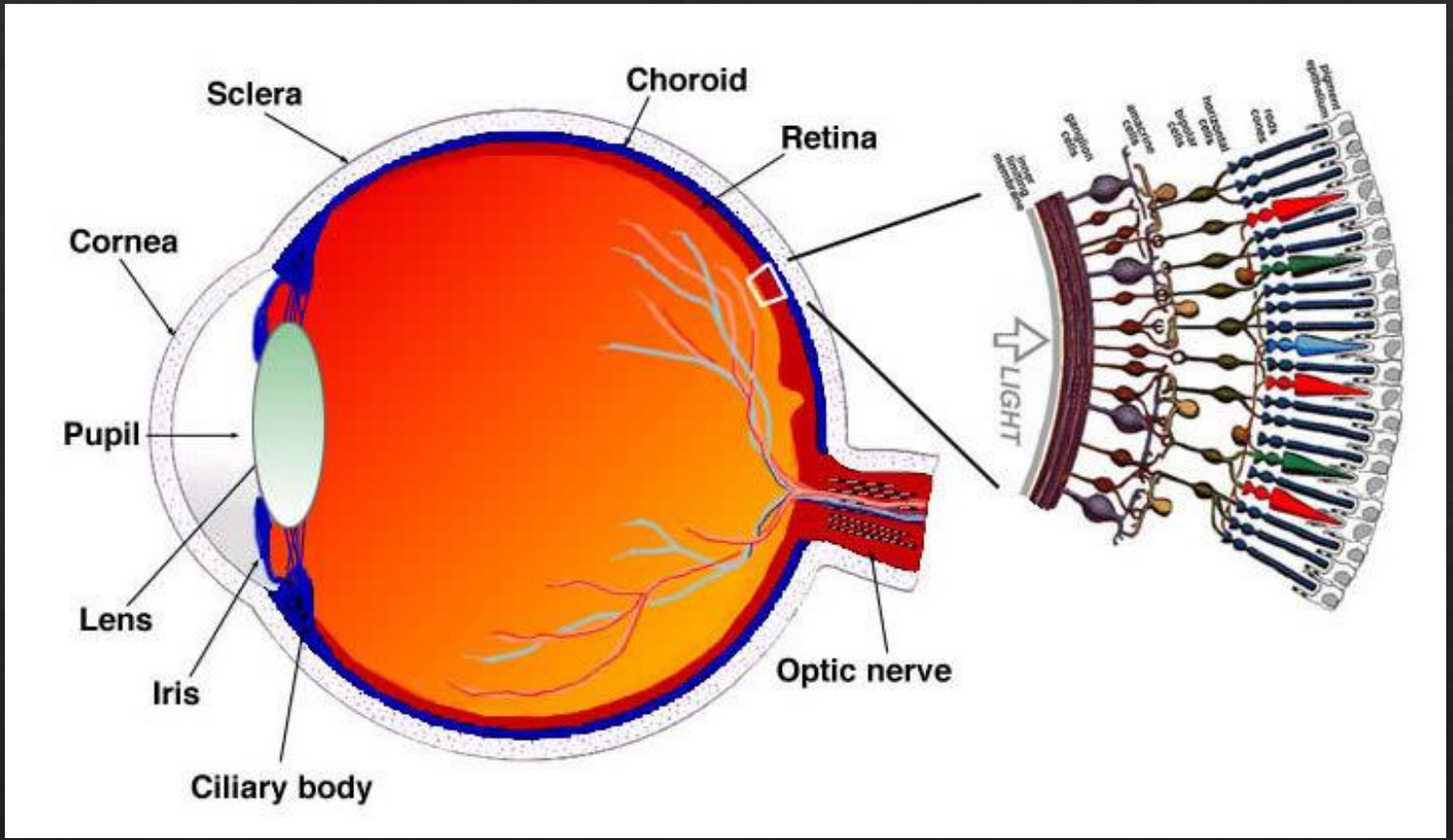
Displays





Displays

Human vision -- optics



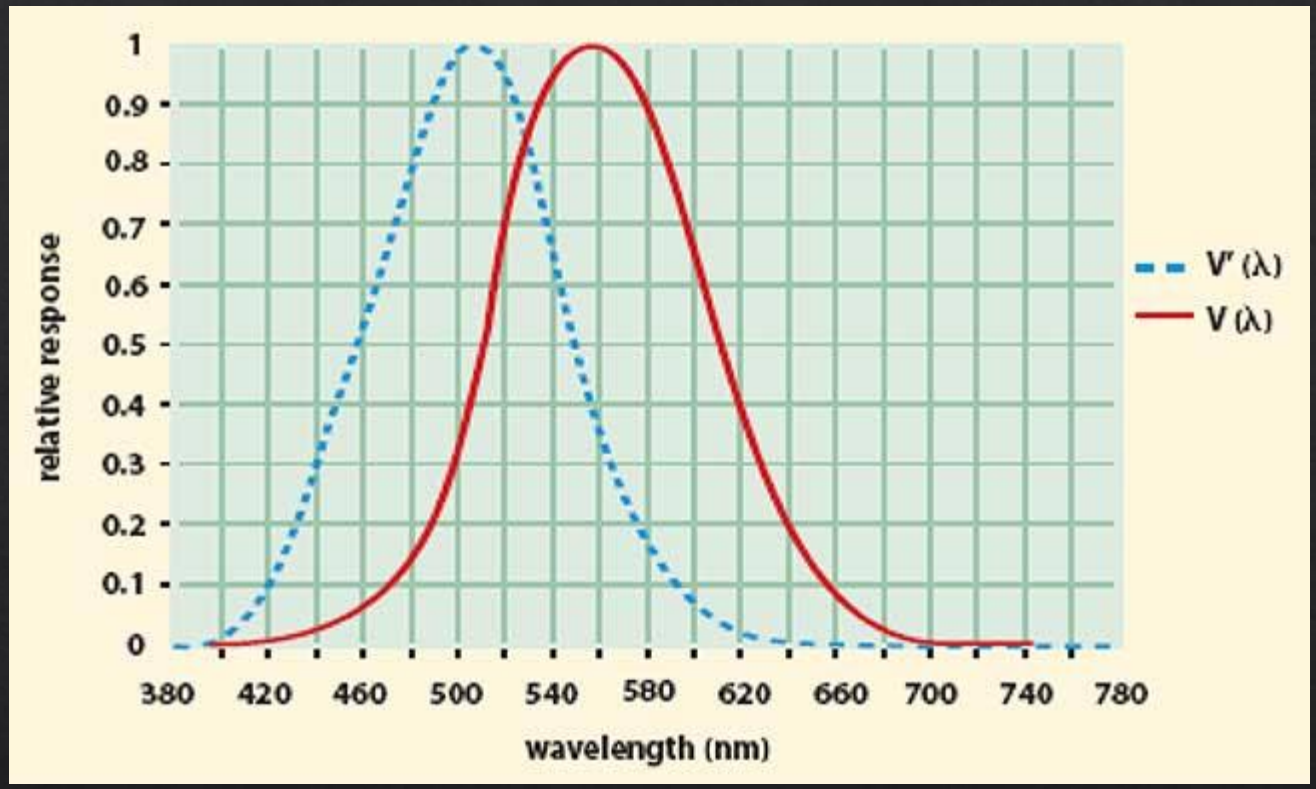
Human vision -- perception

http://persci.mit.edu/people/adelson/checkershadow_proof

Human vision -- perception

http://persci.mit.edu/people/adelson/checkershadow_proof

Perceived energy -- photometry



https://www.photonics.com/Articles/Photometry_The_Answer_to_How_Light_Is_Perceived/a25119

https://graphics.stanford.edu/courses/cs178-10/applets/colormatching.html

CG – account for all factors!