**Normal images vs. noised images (Gaussian)**

**Denoising techniques:**

- Using filters in 2D

- Median filters (varying size, relate to length in 1D)

- Median filter vs. gaussian filter vs. average filter

**RGB image format**

- Each pixel of a color image is made up of differing portions of red, green and blue

- You can extract each part &/or mix & match (picture inversion)

**Edge detection**

- Extract edges from images automatically (Jake picture)

- Explain how this is hard sometimes (noisy Jake picture)

- Explain how this can be overcome (filtering before automated edge detection)

**\*** Give them a noisy example (perhaps in the green channel) and tell them to denoise and extract edges.

**Automated Waldo detection**

- Let the kiddos attempt to find Waldo for a few minutes

- Get them to use the automated technique to assist (only takes a few seconds!)

- Show the Waldo video and explain how automation can assist and/or achieve superhuman speed in challenging tasks.

**Retinopathy image: blood vessel segmentation**

- The contrast between blood vessels and background is significantly more pronounced in the **GREEN** channel of retinopathy images.

- Using a GAUSSIAN filter on the **GREEN** channel improves the effectiveness of automated retinal extraction.

- Illustrate how this is the case and why color channels are important.

\* Give them an example where they need to explore different color channels to solve a problem (not written yet).