On the Salience of Novel Stimuli: Adaptation and Image Noise

Mark D. Fairchild & Garrett M. Johnson
RIT - MCSL

...adaptation increases the salience of novel stimuli by partially discounting the ambient background.

Michael Webster, UN-R (2003)
Identity Aftereffects

Identity Aftereffects
Bush or Kerry?

Emotion Aftereffects
Chromatic Adaptation

Spatial Frequency Adaptation
Blur Adaptation

Blur Contrast in Photography
What About Noise?

more complex spatial frequency patterns that overlap image content

Noise Adaptation
Adapting Stimuli

Test Images
**Stimulus Configuration**

**Experimental Details**

- Adjustment Thresholds
- 7.5° Square Images, (320 cd/m², D65)
- All Combinations of Adapting/Image Noise
- Two Obs. / 5 Replicates Each
- Ten Obs. / Once Each
- Cycling Stimulus: 4 sec. Adapt — 1 sec. Image
Random Noise Thresholds

Hor. & Vert. Noise
Adapted Contrast Sensitivity Model

\[ CSF_a = CSF_{FFT}(im) + 1^{FFT \text{ of Image}} \]

Original Image → FFT of Image → Smoothed FFT → Spatial Filtered Image

Image-Difference Computation

Original Image → Image Adapted CSF → Filtered Original Image → Image Difference Between Original and Noise+Original

Original Image → Image Plus Noise → Adapting Noise → FFT of Image and Noise

Smoothed FFT of Noise and Image Combined → Image & Noise Adapted CSF → Filtered Image & Noise Image
All 10 Observers

- Model very clean and large effect (calibration)

Image Dependency

- No Selective Attention in the Model
What About Channels?

• A multi-channel or multi-scale model would make similar predictions
• This form is simpler and apparently adequate
• Suggests ideas for channel-free chromatic adaptation models, perhaps useful in spectral imaging

The Novel Stimuli...

• Image Content, not Image Artifacts
Thank you ...

This research was brought to you by the letter A and the number 3

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