

**NATIONAL INSTITUTE OF TECHNOLOGY CALICUT**  
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**Online Teaching Method Using Eraser Tool of Image Editing Software**

Writing tablets which can be interfaced with computers are useful for content delivery when the mode of teaching is online. However, the writing area is limited for such tablets and it is sometimes inconvenient to use them particularly when large number of mathematical equations are to be written. Further, users may sometimes feel good amount of latency while using such devices. The following new method of content delivery has been used by Dr. M. Surya Prakash of ECED for one of the classes:

- The content to be presented is written on an A4 paper.
- The scanned version of it stored in some image format on a computer.
- The image is opened using an image editing software and a layer is laid on the image with appropriate amount of transparency.
- An eraser tool is used to make the content opaque while recording the screen and audio using some screen recording software. Transparency in the layer helps teacher to choose the appropriate portion of the slide upon which the eraser must be used.
- The contrast of the recorded video is increased to hide the masked content to make it appear as if the text is being made to appear on a white paper.

Figures 1, 2 and 3 gives a demonstration of the above mentioned product.

$$\begin{aligned}
 m=2: \quad \alpha_1(k) &= \frac{\alpha_2(k) - \alpha_2(2) \cdot \alpha_2(2-k)}{1 - \alpha_2^2(2)} \\
 k=1: \quad \alpha_1(1) &= \frac{\alpha_2(1) - \frac{1}{3} \cdot \alpha_2(1)}{1 - (\frac{1}{3})^2} = \frac{1}{2} \\
 \text{or } \alpha_2(1) &= k_1 = \frac{1}{2} \\
 \therefore k_1 &= \frac{1}{2}, \quad k_2 = \frac{1}{3}, \quad k_3 = \frac{1}{4} \\
 \alpha_1(0) &= 1, \quad \alpha_1(1) = \frac{1}{2} \\
 \alpha_2(0) &= 1, \quad \alpha_2(1) = \frac{2}{3}, \quad \alpha_2(2) = \frac{1}{3} \\
 \alpha_3(0) &= 1, \quad \alpha_3(1) = \frac{3}{4}, \quad \alpha_3(2) = \frac{1}{2}, \quad \alpha_3(3) = \frac{1}{4}
 \end{aligned}$$

Figure 1: Slide with entire content visible.

$$\underline{m=2}: \quad \alpha_1(k) = \frac{\alpha_2(k) - \alpha_2(2) \cdot \alpha_2(2-k)}{1 - \alpha_2^2(2)}$$

$$\underline{k=1}: \quad \alpha_1(1) = \frac{\alpha_2(1) - \frac{1}{3} \cdot \alpha_2(1)}{1 - (\frac{1}{3})^2} = \frac{1}{2}$$

$$\text{or } \alpha_2(1) = k_1 = \frac{1}{2}$$

$$\therefore k_1 = \frac{1}{2}, \quad k_2 = \frac{1}{3}, \quad k_3 = \frac{1}{4}$$

$$\alpha_1(0) = 1, \quad \alpha_1(1) = \frac{1}{2}$$

$$\alpha_2(0) = 1 \quad \alpha_2(1) = \frac{2}{3} \quad \alpha_2(2) = \frac{1}{3}$$

$$\alpha_3(0) = 1 \quad \alpha_3(1) = \frac{3}{4} \quad \alpha_3(2) = \frac{1}{2} \quad \alpha_3(3) = \frac{1}{4}$$

Figure 2: Appearance of slide with a transparent layer added to it.

$$\underline{m=2}: \quad \alpha_1(k) = \frac{\alpha_2(k) - \alpha_2(2) \cdot \alpha_2(2-k)}{1 + \boxed{k_2^2(2)}}$$

$$\underline{k=1}: \quad \alpha_1(1) = \frac{\alpha_2(1) - \frac{1}{3} \cdot \alpha_2(1)}{1 - (\frac{1}{3})^2} = \frac{1}{2}$$

$$\text{or } \alpha_2(1) = k_1 = \frac{1}{2}$$

$$\therefore k_1 = \frac{1}{2}, \quad k_2 = \frac{1}{3}, \quad k_3 = \frac{1}{4}$$

$$\alpha_1(0) = 1, \quad \alpha_1(1) = \frac{1}{2}$$

$$\alpha_2(0) = 1 \quad \alpha_2(1) = \frac{2}{3} \quad \alpha_2(2) = \frac{1}{3}$$

$$\alpha_3(0) = 1 \quad \alpha_3(1) = \frac{3}{4} \quad \alpha_3(2) = \frac{1}{2} \quad \alpha_3(3) = \frac{1}{4}$$

Figure 3: Appearance of slide while recording.