



Tecnicatura Universitaria en Programación

INGLÉS II

Trabajo Práctico Integrador N° 2:
Bringing Color to E-Readers

Trabajo Práctico Integrador II
1° Año – 2° Cuatrimestre



Trabajo Práctico N° 2

Bringing Color to E-Readers (Rachel Kremen)	
1.	One of the hot topics at the Consumer Electronics Show (CES) this week in Las Vegas is color e-readers, with several companies showcasing new products. While E Ink has been a leader in e-reader display technology, the company has yet to produce a color display capable of showing video, and the next generation of devices could threaten E Ink's dominance.
2.	E Ink's monochrome screens are made up of microcapsules full of positively charged white particles and negatively charged black particles. Applying a negative charge causes a pixel containing the particles to appear white, while a positive charge results in a black appearance. Color versions use the same basic technology, but with colored filters added. Unfortunately, these filters tend to reduce the brightness of the display, leading to a washed out appearance.
3.	Companies such as Pixel Qi, Qualcomm MEMS Technologies, Liquavista, and Kent Displays all have new ideas about the best way to make a good color screen for an e-reader, and they are eager to get in the game.
4.	This morning at the CES, Pixel Qi demonstrated its new display technology, targeted for use in netbooks, e-readers, and tablets. In high-power mode, the 10.1-inch display acts like a traditional LCD screen: a backlight provides light that is filtered by red, green, and blue sub-pixels to create desired colors. However, the display also has a low-power mode. In this mode the backlight is turned off, and reflective, mirror-like, elements--placed alongside the red, green, and, blue subpixels--take over the job of displaying the image, now in black and white. (How these elements are operated and distributed across the screen is being kept secret by Pixel Qi.)
5.	Switching from the backlit mode, to the reflective one drops the display's power consumption from 2.5 Watts to 0.5 Watts. This is for a refresh rate of 60 Hz--fast enough to display video. Pixel Qi claims that using software to put the display into an e-reader mode--suitable for reading text, where the screen might only update ten times a second--could drop the power consumption to as low as 100 mill watts. The displays are currently in mass production and a number of device manufacturers are expected to announce products incorporating Pixel Qi's display shortly.
6.	"This is the year where you're going to see some very interesting designs come to market," says Jim Cathey, vice president of business development for

Qualcomm MEMS Technologies. "I don't think they'll even be called e-readers in the near future." With a myriad of features such as Web access, e-mail, and e-reader programs, these products will be known as smart devices, he says.

7. Qualcomm's Mirasol screens can handle all of those applications and even display video. Much like E Ink screens, Mirasol displays are reflective and require little to no power until the on-screen content needs to change. A little ambient light is also all that's needed to see the screen. These displays are consequently ideal for a task such as reading, when the screen doesn't have to change very often. But the Qualcomm device differs greatly when it comes to other applications, such as video or text messaging, that require frequent changes on screen. In those scenarios, Cathey says, Mirasol's displays perform much better than E Ink's because **they** require less power per screen change. "As the content changes, the user experience changes and so do the requirements," he says.

8. Mirasol screens, **which** are expected to appear in e-readers later this year, are composed of Interferometric Modulator (IMOD) elements. Each element is made of two conductive plates. One is a thin film stack on top of a glass substrate, and the other has a reflective membrane. The height of the air gap between the plates determines the color of light that is reflected from the IMOD. When a voltage is applied, the plates are drawn together by electrostatic forces and the element goes black. When the voltage is removed, the plates separate and color is reflected off the IMOD. A single pixel is made up of several IMODs; adjusting the height of each affects the overall color of the pixel. The plates stay in place, using almost no energy, until the color needs to change again. A plate only has to move a few hundred nanometers to change color and can do it in tens of microseconds-fast enough to show video.

9. The LCD-based screens from Kent Displays feature technology that is very different. "Our material is transparent, so **we** can put three layers on top of each other," explains Asad Kahn, the company's chief technology officer. "One is red, one is green, and one is blue." In contrast, IMOD elements have to be placed side by side. Kahn says the layering approach ultimately leads to a brighter display. And unlike Qualcomm, Kent's technology is already on sale. The Fujitsu FLEPia color e-reader, released last spring, features the screens. Unfortunately, the refresh rates aren't yet fast enough for video.

10. Liquavista announced two color e-reader screens of its own this week. Both the LiquavistaColor and the LiquavistaVivid are readable in sunlight, but **the latter** will also include a backlight for more vibrant hues. The screens are slated for release in 2010 and 2011, respectively. The LCD devices are based on a technique called

electrowetting, in which a voltage is used to modify the surface tension of colored oil on a solid substrate. In the absence of a voltage, the oil forms a film over the substrate and is visible to the viewer. When a voltage is applied, the pixel becomes transparent. By controlling the voltage of each pixel independently, a picture can be displayed. Unlike E Ink's technology, electrowetting pixels can be switched in a few milliseconds, making them suitable for showing video.

11. With so many video-capable e-reader screens on the horizon, E Ink has decided to focus solely on one application: reading. But its upcoming devices will feature color screens. Sri Peruvemba, the vice president of marketing at E Ink, says the company will have color devices out by the end of next year. Unfortunately, the refresh rates are too slow for video. "We have animation that we can do today, but we can't do full video speed," Peruvemba says.

12. So while their competitors will likely slice up the market for smart devices with Internet and video capabilities, E Ink plans to go after the education market. The company will make "dedicated" e-readers for computer textbooks, Peruvemba says, adding that the color should add to the experience. But the devices will intentionally omit any distracting applications, such as a phone or Web browser.

13. "If I give one of these devices to my daughter and I know she's going to make phone calls on it and surf the Internet on it, I'm not going to be motivated to buy it for her," he says.

Actividades:

1. CONECTORES. Extraer del texto dos conectores y escribir su relación lógica (a qué grupo corresponden). / [Connectors. Extract and write.](#)

2. INTERPRETACIÓN: SINÓNIMOS. Encontrar en el texto (en el N° de párrafo y línea) los sinónimos de las palabras detalladas a continuación. / [Synonyms. Find.](#)

N° Párrafo y Línea	Sinónimo
1 / 4 – following	
6 / 4 – characteristics	
7 / 2 – need (v)	
8 / 4 – space	

3. INTERPRETACIÓN: ANTÓNIMOS. Encontrar en el texto (en el N° de párrafo y línea) los antónimos de las siguientes expresiones. / [Antonyms. Find.](#)

N° Párrafo y Línea	Antónimo
5 / 4 – inappropriate	
8 / 12 – slow	
10 / 6 – presence	
11 / 4 – luckily	

4. INTERPRETACIÓN: TRADUCCIÓN. Traducir el párrafo N° 10. / [Translation. Translate.](#)

5. INTERPRETACIÓN: VERDADERO/FALSO. Señalar si las siguientes declaraciones son Verdaderas (V) o Falsas (F). Justificar las Falsas. / [True or False. Identify and justify.](#)

- 1) E-Ink, una de las compañías líderes de la tecnología de pantallas para lectores, ha logrado producir una pantalla en color capaz de mostrar video. _____
- 2) Estas pantallas no son muy propicias para tareas como la lectura ya que tienden a cambiar con frecuencia. _____
- 3) Las pantallas Mirasol funcionan mucho mejor que las de E-Ink puesto que requieren menos potencia por cada frecuencia. _____
- 4) Las pantallas Mirasol están compuestas de elementos de Modulador Interferométrico (IMOD). _____
- 5) Varios IMODs componen varios píxeles. _____
- 6) En el presente, se pueden hacer animaciones pero aun no se pueden hacer videos a velocidad completa. _____

6. INTERPRETACIÓN: PREGUNTAS. Responder las preguntas a continuación con información extraída del texto. / [Questions. Answer.](#)

- 1) ¿Qué se logra en las pantallas E-Ink al aplicar una carga negativa?

- 2) ¿Qué se logra al aplicar una carga positiva?

- 3) ¿Cuál es la desventaja de los filtros en color?

- 4) ¿Qué compañía hizo una demostración de su nueva tecnología de pantallas?

- 5) ¿Cuál fue el objetivo de dicha demostración?

- 6) ¿Cómo actúa la pantalla en modo de alta potencia?

- 7) ¿Cómo actúa la pantalla en modo de baja potencia?

- 8) ¿Cuál es el único enfoque de E-Ink?

7. INTERPRETACIÓN: VOCABULARIO. Extraer al menos diez palabras de su interés y confeccionar un glosario con las mismas. / [Vocabulary. Elaborate.](#)

8. INTERPRETACIÓN: REFERENTES. Analizar las palabras en **negrita** e identificar su referente. / [References. Analyze.](#)

2 – these filters:
3 – they:
6 – I:
7 – they:
8 – which:
9 – we:
10 – the latter:

9. INTERPRETACIÓN: IDEAS PRINCIPALES. Identificar las ideas principales del artículo y debatir (en el foro) el resumen del mismo. / [Main Ideas. Identify and discuss.](#)

Bibliografía

MIT Technology Review. (15.01.2010). Bringing Color to E-Readers. n/a.
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