Seeing the World through Rose-Colored Glasses

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⭐ Academic Experience
⭐ B.S. in Computer Science: UNC ’07
⭐ M.S. in Computer Science: VT ’13
⭐ Ph.D. in Computer Science: VT ’17

⭐ Industry Experience
⭐ IBM
⭐ Red Hat
⭐ Xerox Research Centre Europe
Teaching Experience: I have been an Instructor for 1 course, a co-instructor for 1 course, and a teaching assistant for 13 courses:

1. Spring 2005: 3D Computer Modeling and Animation (COMP 006D) – Teaching Assistant
2. Fall 2009: Introduction to Software Design (CS 1114) – Graduate Teaching Assistant
3. Fall 2010: Engineering Exploration (ENGE 1024) – Workshop Leader
5. Fall 2011: Introduction to Media Computation (CS 1124) – Co-Instructor
7. Fall 2014: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
8. Spring 2015: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
9. Summer 2015: Global Perspectives in Higher Education (GRAD 5954) – Graduate Teaching Assistant
10. Fall 2015: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
11. Spring 2016: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
12. Summer 2017: Global Perspectives in Higher Education (GRAD 5954) – Graduate Teaching Assistant
13. Fall 2016: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
14. Spring 2017: Preparing the Future Professoriate (GRAD 5104) – Graduate Teaching Assistant
15. Summer 2017: Global Perspectives in Higher Education (GRAD 5954) – Graduate Teaching Assistant

Global Perspectives in Higher Education (GRAD 5954) is a study abroad course. I am the primary organizer of this experience. With support of Vice President and Dean of Graduate Education Karen DePauw, I contact our participating institutions abroad, plan our travel, lodging, meals, and itinerary. I then help in the successful execution of these plans by traveling with the group and facilitating successful interactions between our cohort and our hosts.
Overview

1. Images and Color

2. Media Computation API

3. Rose-Colored Glasses
Are you familiar with the idiom, “rose-colored glasses”?
Have you done anything with images before (on a computer)?
HOW DO COMPUTERS REPRESENT IMAGES?
Raster and Vector Graphics
Raster and Vector Graphics
Raster Graphics: Array of Pixels

- array of pixels
- a pixel has a position and a color
HOW DO COMPUTERS REPRESENT COLORS?
“Ones and Zeroes”

– Technically Correct
Many possible representations

- **Red, Green, and Blue Values**
  - Additive Color (light, like from a monitor)

- **CMYK**
  - Cyan, Magenta, Yellow, black, subtractive
Representing Images

- **Image:**
  - Array of Pixels

- **Pixel:**
  - R,G,B values (0, 255)
  - X,Y values for position in image
Overview

1. Images and Color

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3. Rose-Colored Glasses
MEDIACOMP

FOR JAVA

Barbara Ericson

Mark Guzdial
MediaComp API

* FileChooser.pickAFile
  * launches a file chooser and returns a String for the “path” to the selected file

* Picture
  * constructor expects a String with the path to a picture file (e.g. *.jpg, *.png)
  * getPixels
    * returns an array of Pixels
  * getWidth
  * getHeight
  * getPixel
  * explore
    * open a picture explorer that shows a Picture and allows the user to inspect Pixels
  * show
    * displays a Picture

more about the API: http://tiny.cc/csc130mc
MediaComp API

- FileChooser.pickAFile

  - launches a file chooser and returns a **String** for the “path” to the selected file

- Picture

  - constructor expects a **String** with the path to a picture file (e.g. *.jpg, *.png)

  - **explore**

    - open a picture explorer that shows a **Picture** and allows the user to inspect **Pixels**

**more about the API:** [http://tiny.cc/csc130mc](http://tiny.cc/csc130mc)
Let’s do it!

1. Download (and unzip):
   1. mediacomp.jar: http://tiny.cc/csc130
   2. ExplorePicture.java (example): http://tiny.cc/csc130ex

2. Create New Java Project named: ExplorePicture

3. Drag ExplorePicture.java into the src folder (choose Copy)
   1. you should notice red X’s to indicate there are errors

4. Right-click on the java project and choose Build Path ▶ Add Libraries…

5. Choose User Library and click Next

6. Click the User Libraries… button

7. Click New… enter the name mediacomp and click OK.

8. With the newly created user library selected, click Add External JARs…
   1. Browse to the mediacomp.jar that you downloaded in 1.1 (above) and click Open
   2. Click OK

3. Ensure that your new user library is still selected and click Finish
YOU SHOULD HAVE A PICTURE DISPLAYING ON YOUR SCREEN

IF YOU CLICK ON THE PICTURE, THE X, Y, R, G, AND B VALUES SHOULD ALL UPDATE TO REFLECT THE SELECTED PIXEL
MediaComp API (cont’d)

- **Pixel**
  - getColor
    - getRed...
  - setColor
    - setRed
  - getX, getY

- **Color**
  - constructor
  - getRed, getGreen, getBlue

more about the API: [http://tiny.cc/csc130mc](http://tiny.cc/csc130mc)
Overview

1. Images and Color
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3. Rose-Colored Glasses
Rose-Colored Glasses
How could we make the Picture look like it is rosier?
Let’s do this too!

1. Download (and unzip) RoseColoredGlasses.java [http://tiny.cc/roseglass]

2. Create new Java Project named RoseColoredGlasses

3. Drag RoseColoredGlasses.java into the new project’s src folder (choose Copy)

4. Right-click on the java project and choose Build Path ▶ Add Libraries...

5. Choose User Library and click Next

6. Select the mediacomp library and click Finish
RECAP

REPRESENTING IMAGES AND COLORS, MEDIACOMP API, ROSE-COLORED GLASSES
Thank you
CSC 130!

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http://tiny.cc/phoenixify
References

- Media Computation JAR: http://tiny.cc/csc130
- Media Computation API Reference: http://courses.cs.vt.edu/~cs1114/api/mediacomponent/
- rose-colored glasses image: http://funny.pho.to/through-rose-colored-glasses/
- other glasses: https://commons.wikimedia.org/wiki/File:Conrad_von_Soest,_'Brillenapostel'_(1403)_rose-coloured-glasses.jpg
- color cube image: https://miac.unibas.ch/SIP/02-Fundamentals.html