Ecualización de imágenes

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*Resumen* – La ecualización de imágenes es una técnica que mejora el contraste en las imágenes, obteniendo una imagen más equilibrada. En esta práctica usamos el método de procesamiento de imágenes por medio del histograma de ecualización visto en clase, se realizó un código en R que fue modificando imágenes para pasar de tonos oscuros o claros a otros más nítidos, además capturamos imágenes propias para pasarlas por el método primero convirtiéndolas a blanco y negro y luego usando el método para que tuvieran una apariencia más nítida.

*Términos de Indexación* - About **four**, placed in **alphabetical** order, key words or phrases that are separated by commas (e.g., Camera-ready, FIE format, Preparation of papers, Two-column format). Italic for the label “Index Terms”; otherwise, regular font.

Introducción

La ecualización de imágenes es una técnica fundamental en el procesamiento digital de imágenes, que se utiliza ampliamente para mejorar la calidad visual de una imagen al ajustar su contraste. El contraste es un atributo esencial que define la diferencia entre las áreas más claras y oscuras de una imagen. Cuando una imagen tiene un contraste bajo, los detalles importantes pueden quedar ocultos en zonas demasiado oscuras o claras, dificultando su análisis y comprensión.

La técnica redistribuye los valores de intensidad de la imagen de manera que el histograma de la imagen se expanda, cubriendo un rango más amplio de gris. Esto significa que los niveles de intensidad que en la imagen original se encontraban agrupados en un rango limitado, ahora se extienden para cubrir un espectro más amplio de valores.

Materiales

Las herramientas utilizadas para el procedimiento de la presente practica fueron:

* Computadora portátil
* R 4.4.1
* Imágenes de prueba, proporcionadas por el profesor
* Código base para la implementación del método, proporcionado por el profesor
* Imágenes tomadas por la alumna

Los materiales utilizados fueron en su mayoría proporcionados por el profesor, a excepción de las imágenes para poner en práctica lo aprendido.

Objetivo

El objetivo de esta práctica es aprender a aplicar las técnicas de ecualización de histogramas en imágenes para modificar el contraste, utilizando el software estadístico R.

Planteamiento

I. Se explicará la relación entre la forma de los histogramas y el contraste de la imagen correspondiente

Un histograma de imagen es una representación gráfica que muestra la distribución de los niveles de intensidad de los píxeles en una imagen.

El contraste en una imagen se refiere a la diferencia entre los niveles de brillo de diferentes partes de la imagen. Un alto contraste implica que hay una gran diferencia entre las áreas claras y oscuras, mientras que un bajo contraste significa que los niveles de brillo son más similares, lo que puede hacer que la imagen se vea plana o deslavada.

Por lo tanto la forma del histograma de la imagen representara el contraste que tiene, graficando los niveles de brillo de diferentes partes de la imagen.

After you enter the title and author information enter a few blank lines and then insert a Continuous section break. Now you must define this section to be in two-column format. To do this in *Word*, under the “Format” menu select “Columns.” This option will open the Columns window. It has an input box for the number of columns. Enter 2 and then set the spacing to 0.2” and select equal column widths. If you have the margin widths set correctly, the width of the column should display as 3.40”. If it does not, go to the “File” menu and select “Page Setup - Margins.” This will open the “Page Setup” window that will allow you to set the top and bottom margins to 1” and the right and left margins to 0.75.”

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Use the full justify option for your paragraphs, and use two-columns for all text. The two columns must always exhibit equal lengths and you should try to fill your last page as much as possible. To obtain such results, you are free to adjust the figure sizes provided this does not compromise their clarity. Use one line of space between text and section headings. Use one line of space between text and captions, equations, and tables. Use the spelling and grammar checkers. Do not use the “hyphenation” feature in *Word*. Please use the following font and alignment instructions:

* **Text**: Use the style “First Paragraph” for the first paragraph in each section, and “Text” for succeeding paragraphs in the section. 10 point, Times New Roman, full justified, single space, no blank lines or other space between the paragraphs. Indents - first paragraph of section - none; all other paragraphs - .25”. Follow the examples shown in this document. DO NOT USE SPACES TO INDENT YOUR PARAGRAPHS. Times New Roman is not a proportional font.
* **Section Headings**: 10 point, Times New Roman, bold, centered, use Small Caps with paragraph spacing of 8 points above and 8 points below. For example, “Page Layout” on page one of this document is a Section Heading (this style is defined under the style menu of this document as “Section Headings”). To convert the text to small caps, click on Format, Font. This will open the “Font Window” where you can select the Small Cap option. If a section heading is at the top of a column, set the “above” spacing in the paragraph window to 0 points. See “Copyright” and “References” on p. 3.
* **Section Sub-headings**: 10 point, Times New Roman, italic, left justified, with spacing of 6 points above and below. For example, “Font and Spacing Instructions” on this page is a Section Sub Heading (this style is defined under the style menu of this document as “Subheading”). For multiple levels of subheadings, use *Ia* and *Iai*, for example.
* **Bullets**: 10 point, Times New Roman, left justify and indent the text 0.25.” Insert a blank line after the bullet list but not before, follow the examples in this document (this style is defined under the style menu of this document as “Bullets”).

Figures, Tables, and Equations

All figures and tables must fit either one or two-column width, 3.4” or 7” wide respectively. It is suggested that you use one-column figures and tables whenever possible. If your table or figure will not fit into one column, then insert a continuous section break before and after the table or figure, as described above and define it as one-column. To make the paper read easier, you may want to position any table or figure that requires the full width of the paper either at the bottom of the page or the top of a new page.

Do not abbreviate “Table” or “Figure.” Use Roman numerals FOR BOTH. Use the following format guidelines for figures and tables:

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* Leave one blank line above and below each Table or Figure.
* **Figure and table captions**: 8 point, Times New Roman, Small Caps, centered. Place below the figure or table headings (this style is defined under the style menu of this document as “Figure Caption”). Make sure you use title case.
* **Table text**: 8 point, Times New Roman, (this style is defined under the style menu of this document as “Table text”)

Table I and Figure I below illustrates proper Table and Figure formatting. Avoid placing figures and tables before their first mention in the text. IEEE has the following rules for inserting graphics as figures:

* The manuscript’s graphics should have resolutions of 600 dpi for monochrome, 300 dpi for grayscale, and 300 dpi for color.
* Graphics should be inserted into the manuscript file by clicking on “Insert – Photo – Picture From File.” This means you must save every graphics as a separate file. Do not use cut and paste to insert graphics.
* Do not link to a graphic. When inserting figures or tables be sure you insert the figure and not just a link to the figure. The best way to make sure you are doing this correctly is to save your paper, then open the file on a different machine and make sure all your figures are correct. If you insert the link instead of the figure or table, a box with a big red x will appear in the location where the table or figure is supposed to be located.
* **DO NOT use text boxes for forcing in a table or figure that needs the full width of the paper.**
* **DO NOT use text boxes for captions.**

TABLE I

Point Sizes and Type Styles

|  |  |  |
| --- | --- | --- |
| Points | Type of Text | Type Styles |
| 8  10  8  8  8  10  10  10  10  10  10  11  24 | Table text  Figure and Table Headings  Figure and Table Captions  Footnote  Reference list  Abstract  Index Terms  Section Titles  Main Text and Equations  Subheadings  Author email  Author name  Title | UPPERCASE  Small Caps  **Bold**  **Small Caps, Bold**  *Italic*, Left justified  Title Case |



Figure I

Logo of the Institute for Electrical and Electronics Engineers

Number equations consecutively with equation numbers in parentheses flush with the right margin, as in (1). This is best achieved by using a right tab. DO NOT USE SPACES to position your equations.

*2jk ∂u/∂z = ∂2u/∂x2 + k2 (n2* - β*2) u*  (1)

Refer to “(1),” not “Eq. (1)” or “Equation (1),” except at the beginning of a sentence: “Equation (1) is….”

Make sure you use only the “Symbol Font” for all your symbols, or embed all your different symbol fonts within the file when you save the document.

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Authors do not add header and footer information. The Publications Chair will add the standard IEEE headers and footers as part of preparing the papers for publication.

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Template Use

**DO NOT ALTER THE TEMPLATE.** Authors who change margins and font sizes, do not use the requested figure and table title formats, do not use the requested reference format, or otherwise do not use the template will have their paper returned to them for correction.

Formatting reminders: the first paragraph in a section or subsection is not indented; subsequent paragraphs are first line indented at .25”. Section headers have spacing of single with 8 pt before and after. Subsection headers have spacing of single with 6 pt before and after. Don’t have spaces between paragraphs.

Other formatting issues that will result in your paper being sent back to you to re-edit include having tables breaking over columns, (sub) headings being separated from the related text over column or page breaks, the use of hard returns (the enter key) to force a column or page break (use Insert, Break, then either Page or Column).

Acknowledgment

The preferred spelling of the word “acknowledgment” in American English is without an “e” after the “g.” Use the singular heading even if you have many acknowledgments. Please put the sponsor acknowledgments in this section. Do not use a footnote on the first page.

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Do not have live links (URLs) in your paper. Remove the link (right click, edit hyperlink, remove link) and then the http:\\or https:\\ term. All fonts must be embedded. Embedding typically occurs during the creation of a PDF. IEEE requires PDF version 1.7.

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In Text References

All material from any research resource must be accompanied by a bracketed in-text reference. This reference must correspond to its end-text full bibliographic information in the References section. Failure to properly reference all resource material used in a paper leaves the paper’s author open to charges of plagiarism.

Follow these specifications for **in-text references**:

* Bracket all in-text references: for example, [1].
* In text references must be **numbered sequentially in the text, beginning with [1]** for the first reference. In other words, the first source from which you quote, paraphrase or use information must be referenced in your paper as [1]. The next source from which your quote, paraphrase or use information must be [2]. If in later in your paper, you use information from the same source and same page as [1], then your in-text reference number will again be [1].
* Do not say “Ref. [3]” or “reference [3].” Simply use the bracketed number thusly: [3].
* For material summarized from several sources, use the appropriate bracketed numbers, for example [3]-[5].
* Bracketed reference numbers should appear after the quotation marks on an in-text quote, but before the final punctuation of the quote. For example, “Here’s the quote” [3]. Bracketed references for paraphrases or summaries should appear after the paraphrase or summary, but before the final punctuation of the sentence or passage. For example, Here’s the paraphrased material [4].

References

Place references in a separate References section at the end of the paper. Number the references sequentially by order of appearance, not alphabetically. List up to three authors’ names in a reference; replace the others by “*et al*.”

* **Reference text**: 8 point, Times New Roman, full justified, hanging .25”, no space between the references, tab between right bracket and the start of the reference

[1] “Today in Science History: Engineering Quotes.” 2012.

todayinsci.com/QuotationsCategories/E\_Cat/Engineering-Quotations.htm. Web. Accessed: April 9, 2012.

[2] Donohue, Susan K. and Richards, Larry G. October 2011. “P-12 Engineering Education: Using Engineering Teaching Kits to Address Student Misconceptions in Science.” *Proceedings* of the 41st Frontiers in Education Conference, Rapid City, SD, pp. F2A-1 – F2A-3.

[3] Dweck, Carol S. 2006. *Mindset: The New Psychology of Success*, New York: Random House, Inc.

[4] Kaplan, Avi and Maehr, Martin L. June 2007. “The Contributions and Prospects of Goal Orientation Theory.” *Educational Psychology Review* 19(2), pp. 141 – 184.

[5] Dweck, Carol S. “Messages That Motivate: How Praise Molds Students’ Beliefs, Motivation, and Performance (In Surprising Ways).” In Aronson, Joshua (ed.), 2006, *Improving Academic Achievement: Impact of Psychological Factors on Education*. New York: Elsevier Science, pp. 37 – 60.

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