

Projeto de comunicação serial entre arduinos

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Abstract—The project is carried out on the Tinker cad platform and consists of a serial communication between two arduinos, in which one transmits the information and the other receives it. The first Arduino is composed of an ultrasonic sensor that calculates the distance of an object, in addition to indicating the region where the object is through colored LEDs. The second arduino is composed of an LCD monitor that receives the information given by the first arduino and emits this distance on the screen.

Index Terms—Project, arduino, build, hardware, software

I. INTRODUCTION

O arduino é um dispositivo eletrônico open source que segundo o livro arduino em ação, teve seu início na Itália, em 2005 no Interaction Design Institute na cidade de Ivrea. Com o intuito de promover um ambiente propício para o desenvolvimento de novas tecnologias, o professor Massimo Banzi juntamente com um pesquisador visitante denominado David Cuartielles elaboraram um dispositivo barato e simples de usar, completamente o oposto dos dispositivos disponíveis no mercado da época.

Visto isso, análogo aos ideais dos criadores do arduino, o presente artigo tem como intuito agregar conhecimento ao estudante que está visando aprender sobre esse equipamento de forma prática, através de um projeto de comunicação serial(figura 1) entre dois arduinos, via porta TX RX (figura 1), no qual um dos arduinos transmite a distância de um objeto e o outro recebe essa informação e disponibiliza no display. Com isso, a elaboração desse projeto visa construir e auxiliar o desenvolvimento estudantil, seja ele básico, médio ou superior.

II. DESENVOLVIMENTO

A. Materiais

Hardware:

- 45 Fios conectores;
- 3 Leds, vermelho, azul e branco;
- 3 Resistores de 220 Ω ;
- 2 Arduinos UNO;
- 2 Protoboards;
- 1 Resistor de 1 K Ω ;
- 1 Sensor ultrassônico HC-SR04;

Identify applicable funding agency here. If none, delete this.

- 1 Potenciômetro;
- 1 Display LCD;
- 1 Computador;
- Software:
- GitHub;
- Tinkercad (C);
- Visual Studio Code (latex);

B. Métodos

O projeto foi todo realizado na plataforma tinker cad e inicialmente, pesquisou-se como realizaria a conexão do sensor ultrassônico HC-SR04(figura 2) e do display LCD (figura 3) no arduino UNO, através do site do How to Mechatronics, a partir disso foi realizada programação dos mesmos, atribuindo seus parâmetros e configuração de portas, conforme o código do anexo 1 que localiza a programação do sensor e o anexo 2, a programação do display . Posteriormente foi realizada a comunicação serial, usando o protocolo de comunicação assíncrono UART, na qual é feita uma conexão física entre duas portas do arduino, uma denominada RX que é responsável pela recepção da informação e a TX que transmite a informação (figura 1).

Em seguida foi realizado a conexão dos leds, com seus devidos resistores de 220 Ω (figura 4) e sua definição de parâmetros, bem como sua programação (anexo 3) para localizar as regiões, divididas em: Região 1, de 0 a 112 cm o led vermelho acende, região 2 de 112 a 223cm o led azul acende e de 223 a 355 o led branco acende.

C. *LaTeX-Specific Advice*

Please use “soft” (e.g., `\eqref{Eq}`) cross references instead of “hard” references (e.g., (1)). That will make it possible to combine sections, add equations, or change the order of figures or citations without having to go through the file line by line.

Please don’t use the `{eqnarray}` equation environment. Use `{align}` or `{IEEEeqnarray}` instead. The `{eqnarray}` environment leaves unsightly spaces around relation symbols.

Please note that the `{subequations}` environment in \LaTeX will increment the main equation counter even when there are no equation numbers displayed. If you forget that,

you might write an article in which the equation numbers skip from (17) to (20), causing the copy editors to wonder if you’ve discovered a new method of counting.

L^AT_EX does not work by magic. It doesn’t get the bibliographic data from thin air but from .bib files. If you use L^AT_EX to produce a bibliography you must send the .bib files.

L^AT_EX can’t read your mind. If you assign the same label to a subsubsection and a table, you might find that Table I has been cross referenced as Table IV-B3.

L^AT_EX does not have precognitive abilities. If you put a `\label` command before the command that updates the counter it’s supposed to be using, the label will pick up the last counter to be cross referenced instead. In particular, a `\label` command should not go before the caption of a figure or a table.

Do not use `\nonumber` inside the `{array}` environment. It will not stop equation numbers inside `{array}` (there won’t be any anyway) and it might stop a wanted equation number in the surrounding equation.

D. Some Common Mistakes

- The word “data” is plural, not singular.
- The subscript for the permeability of vacuum μ_0 , and other common scientific constants, is zero with subscript formatting, not a lowercase letter “o”.
- In American English, commas, semicolons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
- A graph within a graph is an “inset”, not an “insert”. The word alternatively is preferred to the word “alternately” (unless you really mean something that alternates).
- Do not use the word “essentially” to mean “approximately” or “effectively”.
- In your paper title, if the words “that uses” can accurately replace the word “using”, capitalize the “u”; if not, keep using lower-cased.
- Be aware of the different meanings of the homophones “affect” and “effect”, “complement” and “compliment”, “discreet” and “discrete”, “principal” and “principle”.
- Do not confuse “imply” and “infer”.
- The prefix “non” is not a word; it should be joined to the word it modifies, usually without a hyphen.
- There is no period after the “et” in the Latin abbreviation “et al.”.
- The abbreviation “i.e.” means “that is”, and the abbreviation “e.g.” means “for example”.

An excellent style manual for science writers is [1].

E. Authors and Affiliations

The class file is designed for, but not limited to, six authors. A minimum of one author is required for all conference articles. Author names should be listed starting from left to right and then moving down to the next line. This is the author sequence that will be used in future citations and by indexing services. Names should not be listed in columns nor group by affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization).

F. Identify the Headings

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Component heads identify the different components of your paper and are not topically subordinate to each other. Examples include Acknowledgments and References and, for these, the correct style to use is “Heading 5”. Use “figure caption” for your Figure captions, and “table head” for your table title. Run-in heads, such as “Abstract”, will require you to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced.

G. Figures and Tables

a) *Positioning Figures and Tables:* Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation “Fig. 1”, even at the beginning of a sentence.

TABLE I
TABLE TYPE STYLES

Table Head	Table Column Head		
	<i>Table column subhead</i>	<i>Subhead</i>	<i>Subhead</i>
copy	More table copy ^a		

^aSample of a Table footnote.

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity “Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of



Fig. 1. Example of a figure caption.

quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

REFERENCES

Please number citations consecutively within brackets [2]. The sentence punctuation follows the bracket [3]. Refer simply to the reference number, as in [4]—do not use “Ref. [4]” or “reference [4]” except at the beginning of a sentence: “Reference [4] was the first ...”

Number footnotes separately in superscripts. Place the actual footnote at the bottom of the column in which it was cited. Do not put footnotes in the abstract or reference list. Use letters for table footnotes.

Unless there are six authors or more give all authors’ names; do not use “et al.”. Papers that have not been published, even if they have been submitted for publication, should be cited as “unpublished” [5]. Papers that have been accepted for publication should be cited as “in press” [6]. Capitalize only the first word in a paper title, except for proper nouns and element symbols.

For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [7].

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