# **REAL TIME** **SECURED COMMUNICATION SYSTEM USING WEBRTC**

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Approval of the Computer Engineering Department

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Chairman/Director

This is to certify that we have read this graduation project and that in our opinion it is fully adequate, in cope and quality, as an Undergraduate Project.

Assist. Prof. Dr. Zefer Ernel

Supervisor

Members of the examining committee

Name Signature

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# Abstract

**REAL TIME SECURED COMMUNICATION SYSTEM USING WEBRTC (RTConn)**

by

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In a world of computers and cell phones, the need for effective and rapid communication system has never been stronger than it is today. RTConn is a secured real time communication system that connects multiple users across the globe using native web API (WebRTC). RTConn allow users connect with each other through video, text, files and screensharing in real time. Allowing collaboration and connection with friends, family, coworker and any one of interest.

By eliminating the need of a server during communication and the requirement to download an external plugin, RTConn increases efficiency, speed and security of data transmitted from one user to another by connecting users’ device together in a pair to pair network.

**Keywords:** WebRTC, VOIP, Internet programming, socket programming, Node.Js, MongoDB, Redis, Video Chat, NoSQL

An informative abstract of length one page should be included beneath the title, student’s name, department name and supervisor. The abstract should a) state the scope and principal objectives of the design project, b) describe the methods employed, c) summarize the results and d) state the principal conclusions (in separate paragraphs, not in sections). It should not simply list the topics covered in the Undergraduate Project Report. In preparing the abstract, you should remember that it will be the most widely read portion of the Undergraduate Project Report. The abstract must be able to stand alone as a very short version of the Undergraduate Project Report rather than as a description of it. The size of the ABSTRACT should be 100 – 200 words. There should be no references in the Abstract.

# Acknowledgments

[OPTIONAL] If you would like to acknowledge any kind of help, moral, advice or motivation from someone. You can also dedicate your work to friends, family ...

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# INTRODUCTION

Now more than ever been able to connect with friends, family, coworker, instructor, student and business partner has become more important. For once, we were all together, celebrating life and love, then distance came in and set us apart form our family, friend and work. With so many social media applications like facebook, Instangram and Whatsapp most of the problem that araise from connect with those we love have been solved. But most of this application like Facebook can only connect you (using Video) with one user a given time, so have a family call with multiple family member is not possible.

Video conferencing is the technology that allows you to hold meetings with several correspondents who are located in different places while seeing them and talking to them in real time. It is different from simple video calling, which is normally one-to-one video communication (WebRTC is built for pear-to-pear communication between two users and has no built in support for conference calling).

Some time ago, expensive complex equipment and expertise is required for video calling or conferencing. Today, one can literally carry it in the pocket. You can participate in and host video conferencing sessions on your smartphone and mobile device as well as on your computer with basic hardware and adequate Internet connectivity.

Video conferencing has become more common and more accessible thanks to the advent and development of Voice Over IP (VOIP), which harnesses the underlying IP infrastructure of the Internet to make free communication possible. Packets of video data, along with packets of voice and other types of data, are carried on the Internet, thereby making voice and video communication free.

All paragraphs should be fully justified (extending from left margin to right margin) with ***1.5 line spacing***. The Body Text should be **Times New Roman font with a 12-point size**.

In the INTRODUCTION the student must clearly state

a. The area of study, its theoretical and practical importance for science and technology.

b.  What was done already in this area by other researchers (briefly).

c.  What problems do still exist in the area of study, or not solved satisfactory, or could be solved in another way or by more efficient techniques.

d.  Which of these problems is the student going to solve or investigate in his/her project (that is, what is the intended contribution to the area by this student and the goal of this project).

f. Structure of the project (brief summary of each subsequent chapter).

# LITERATURE SURVEY

## General

Typically, should cover the following items (at least 3 pages):

A survey and comparative analysis of sufficiently large number of works (publications) in the area of study. This survey should include a brief history of the subject, but main attention should be paid to publications in journals, conference proceeding and published thesis during the last 5 – 7 years. It is desirable to include and comment here an appropriate classification of used methods and approaches in the form of a table or a diagram. The student should avoid referencing Internet (Web) publications in the project, since many of them are not reliable sources of related information.

A detailed description and analysis of two or three published works that are most close to the topic of the project. Clearly specify positive and negative aspects of these works. Use appropriate illustrations and figures here to make your analysis clearer. This part of the project can take two or more sections.

# 3. BACKGROUND INFORMATION

This chapter explains theoretical aspects of the project. It should give, in 3 – 4 sections, a detailed description of what you propose as a new contribution to the area (your method or approach). The chapter can include a general description of the proposed approach, specification of tools (theoretical and experimental) to solve the problem, flowcharts of algorithms, their descriptions, timing diagrams, related mathematical expressions, proposed models and their descriptions, with necessary assumptions under which your method or solution can work.

# 4. IMPLEMEMTATION DETAILS

This chapter also should contain a scheme of the implementation of your method or solution, organization of experiments, based on computation, simulation, and statistical analysis, with appropriate graphs and other illustrations. The obtained results must be discussed and compared with the results given in published works.

Chapter 3 and this chapter together represent the most important parts of your new contribution to the area of study. If necessary, the material of this chapter can be divided into two chapters.

# 5. CONCLUSION AND FUTURE RECOMMENDATION

This Chapter can conclude the project. It should summarize the results of study, emphasize their positive and negative aspects and suggest directions of a further study of the topic to improve the proposed scheme, method or approach.

# 6. REFERENCES

**Example of References**

*Books:*

[1] G. O. Young, “Synthetic structure of industrial plastics,” in *Plastics,* 2nd ed., vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.

[2] W.-K. Chen, *Linear Networks and Systems.* Belmont, CA: Wadsworth, 1993, pp. 123–135.

*Journals(Periodicals):*

[3] J. U. Duncombe, “Infrared navigation—Part I: An assessment of feasibility,” *IEEE Trans. Electron Devices,* vol.ED-11, pp. 34–39, Jan. 1959.

[4] E. P. Wigner, “Theory of traveling-wave optical laser,”*Phys. Rev.,* vol. 134, pp. A635–A646, Dec. 1965.

[5] E. H. Miller, “A note on reflector arrays,” *IEEE Trans.Antennas Propagat.,* to be published.

*Articles from Conference Proceedings (published):*

[6] D. B. Payne and J. R. Stern, “Wavelength-switched passively coupled single-mode optical network,” in *Proc.IOOC-ECOC,* 1985, pp. 585–590.

*Papers Presented at Conferences (unpublished):*

[7] D. Ebehard and E. Voges, “Digital single sideband detection for interferometric sensors,” presented at *the 2nd Int.Conf. Optical Fiber Sensors*, Stuttgart, Germany, Jan. 2-5, 1984.

*Standards/Patents:*

[8] G. Brandli and M. Dick, “Alternating current fed power supply,” U.S. Patent 4 084 217, Nov. 4, 1978.

*Technical Reports:*

[9] E. E. Reber, R. L. Mitchell, and C. J. Carter, “Oxygen absorption in the Earth’s atmosphere,” Aerospace Corp.,Los Angeles, CA, Tech. Rep. TR-0200 (4230-46)-3, Nov. 1968.

**Example of E. References—Electronic Sources**

*Books:* Author. (year, month day). *Title.* (edition) [Type of medium]. *volume (issue).* Available: site/path/file

*Example:*

[1] J. Jones. (1991, May 10). *Networks.* (2nd ed.) [Online].

Available: http://www.atm.com

*Journals:* Author. (year, month). Title. *Journal.* [Type of medium]. *volume (issue),* pages. Available: site/path/file

*Example:*

[2] R. J. Vidmar. (1992, Aug.). On the use of atmospheric plasmas as electromagnetic reflectors. *IEEE Trans.Plasma Sci.* [Online]. *21(3),* pp. 876–880. Available:

http://www.halcyon.com/pub/journals/21ps03-vidmar

*Papers Presented at Conferences:* Author. (year, month). Title. Presented at Conference title. [Type of Medium]. Available: site/path/file

*Example:*

[3] PROCESS Corp., MA. Intranets: Internet technologies deployed behind the firewall for corporate productivity.Presented at INET96 Annu. Meeting. [Online]. Available:

http://home.process.com/Intranets/wp2.htp

*Reports and Handbooks:* Author. (year, month). Title.Company. City, State or Country. [Type of Medium]. Available: site/path/file

*Example:*

[4] S. L. Talleen. (1996, Apr.). The Intranet Architecture:Managing information in the new

paradigm. Amdahl Corp., CA. [Online]. Available:

http://www.amdahl.com/doc/products/bsg/intra/infra/html

# APPENDIX

(if any) can contain additional material, such as source texts of programs, large tables of obtained results, descriptions of used protocols, utility programs, etc. Each Appendix must have its title on a separate page.

1. SPECIFIC REQUIREMENTS

For printing and paper quality, use of laser printers are recommended. Paper size should be A4 size (21 x 29.7 cm), portrait (vertical) orientation. But student can use landscape (horizontal) orientation only for a special purpose. The thesis must be printed on good quality white paper on one side of the paper only.

The text must be typed preferably in Times New Roman 12 pt. font with a margin of 4 cm on the left (the binding side). The remaining margins must be 2.5 cm. wide. Text must be one and a half-spaced, except for quoted sections, references, footnotes, and captions of tables and figures.

The page numbers in the preliminary material are to be in lower case Roman numerals, starting with the approval page that is numbered “ii”. Title page is unnumbered but is the implied number “i”. First page of Chapter 1 (Introduction) uses the Arabic number “1” and pages thereafter carry consecutive Arabic numbers, including the pages in the Appendices and the References. All page numbers are positioned in the upper right-hand corner and 1.5 cm above the first line within the required margin boundaries.

Each chapter must start with a new page. Chapter titles should be written by uppercase letters, with a number ahead.

Titles of section should be written in low case letters, with larger font size (12 point-size) than in the text. The first letter of each word of a section title must be in uppercase. A new section should start immediately after the previous section.

Before the title of a new section (subsection) in the text, there should be 2 blank lines. After the title of a section (subsection), there should be 1 blank line. The same font style should be used for titles of chapters and sections. Do not make the titles of chapters and sections italic and do not underline them and any part of the text. Never use color in the text.

The size of a section (or a subsection) should not be shorter than one page. The same is true for Introduction and Conclusion. Giving a list of some items, do not use bullets since they cannot be easily referenced in the text. If you give a list of some items, then number these items or assign a letter (in brackets) to each listed item. There should be no announcement-like statements or emotional expressions in the text.

Divide each section into paragraphs. All subsequent paragraphs and paragraphs of a section must have 3 – 5 blank spaces at the beginning of the first line. A paragraph should not be longer than 1/3 of a page.

If there is a mathematical expression in a separate line, it must be separated from text above and below by two blank lines. Each mathematical expression, written on a separate line, must be numbered on the right side. The numeration should include the chapter number, for example, (5.7). Here 5 is a chapter number and 7 is the number of expression in this chapter.

An example of equation layout

Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx is

|  |  |  |
| --- | --- | --- |
|  |  | (5.7) |

All figures must be centered and properly labeled. They must be drawn by using a proper computer software of your own choice. Each figure must have its numbered title (caption) written under the figure. Each table must have its numbered title written over the table. The figure captions should be printed using a 10-point proportional font and italic such as Times New Roman with single line spacing. Number figures and tables in each chapter separately (for example, Figure 4.1, Figure 5.1, Table 3.2, etc.). Each figure and table must be referenced in the text.

As shown in Figure 1.6, xxxxxxxxxxx.



Figure 1.6 The view

As shown in Table 3.2, xxxxxxxxxxxxxxxxxxx.

Table 3.2. Data and parameters

|  |  |
| --- | --- |
| Xxxx | Xxxx |
| Xxxx | Xxxx |
| Xxxx | Xxxx |
| Xxxx | Xxxx |

The total number of figures and tables in the project should be not less than 10. There is no good project without a sufficient number of figures, graphs, tables etc. Avoid using primitive (not informative) figures.

Do not put a figure or a table at the start or at the end of the section, in which it is referenced. That is, each figure or a table should be surrounded by the text of the corresponding section.

On graphs, show only the coordinate axes, or at most the major grid lines, to avoid a dense result after reduction. Do not put boxes around your figures to enclose them.

In the text, use only short fragments of programs if they are necessary for explanation. These fragments must be given as figures in the text. As a rule, all complete source texts of programs must be placed in Appendices.

Graduation Project should contain not less than 15 references, preferably from journal and conference proceedings. Each reference must be referenced at least once in the text of the project. The list of references should be given in the order of citation in the text, not in alphabetical order. To reference a source with number 6 in the list of references, use [6].

Formatting of the project, such as the format of the title page, font style, interline spacing etc., must be done according to the requirements of the engineering department. If some items are not specified in those requirements, then the student should consult his/her supervisor.