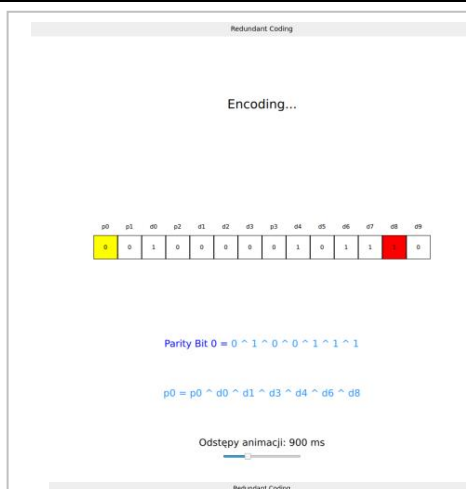


GROUP PROJECT INFORMATION POSTER – MAY 2024

CATHEDRAL FULL NAME

Department of Teleinformation Networks

Project Team:	1. Bartosz Kołakowski - manager
<i>{provide group code from SPG}</i>	2. Paweł Jastrzębski
5@KSTI'2023/24	3. Piotr Noga
	4. Michał Mróz
	5. Maksym Nowak
Guardian:	Bartosz Czaplewski, PhD
Client:	Bartosz Czaplewski, PhD
End Date:	20.06.2024
Keywords:	Redundancy, visualization, Hamming code, Reed-Solomon code, correction



PROJECT TOPIC:

Redundant coding visualization app

OBJECTIVES AND SCOPE OF THE PROJECT:

The aim of the project is to write a tool to support the teaching process. The tool is to be an application that visualizes issues related to redundant coding. The application is to vividly present the classification of redundant codes, the process of encoding and decoding selected redundant codes, the gain of coding, various issues related to the topic, and allow you to conduct experiments. The app must be available in several languages. The application must have an aesthetically pleasing graphical user interface and must be run on MS Windows.

RESULTS ACHIEVED:

An implementation of Hamming code visualization has been created that allows you to type in the output and use an additional parity bit. After encoding a codeword, there is an option to change one bit of the encoded message to errors. This is followed by the decoding process, where the visualization shows us how the incorrectly encoded bit is eliminated. Tests are introduced that automatically check whether coding and decoding have been implemented correctly on sample data. You can choose the pace of the visualization with an intuitive slider. In the second semester, we created an implementation of the Reed-Solomon code visualization along with the appropriate tests. In addition, it is possible to change the language of the program to English.

CHARACTERISTIC FEATURES OF THE SOLUTION, DIRECTIONS OF FURTHER WORK:

CHARACTERISTIC FEATURES OF THE SOLUTION:

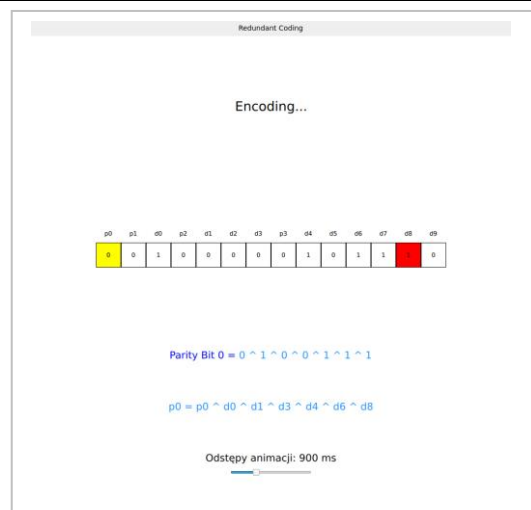
The solution allows you to understand in an accessible way how redundant coding (Hamming code, Reed-Solomon code) works by visualizing both the encoding and decoding process. Thanks to the ability to accept your own code message, change the bit in the coded message and choose the pace of the animation, the user is provided with personalization and the ability to adapt the application to their problem. By translating the program into English, it is available to people from abroad.

TEAM PROJECT INFORMATION FOLDER – MAY 2024

DEPARTMENT FULL NAME

Department of Teleinformation Networks

Project team: <i>{provide group code from the SPG service}</i> 5@KSTI'2023/24	1. Bartosz Kołakowski - leader 2. Paweł Jastrzębski 3. Piotr Noga 4. Michał Mróz 5. Maksym Nowak
Supervisor:	Bartosz Czaplewski, PhD
Client:	Bartosz Czaplewski, PhD
Date:	20.06.2024
Key words:	Redundant coding, visualization, Hamming code, Reed–Solomon code, correction



PROJECT TITLE:

An application that visualizes issues related to redundant coding

OBJECTIVES AND SCOPE:

The aim of the project is to write a tool supporting the teaching process. The tool is to be an application that visualizes issues related to redundant coding. The application is intended to graphically present the classification of redundant codes, the process of encoding and decoding selected redundant codes, coding gain, various issues related to the topic, and allow for conducting experiments. The application must be available in several languages. The application must have an aesthetic graphical user interface and must run on MS Windows.

RESULTS:

An implementation of the Hamming code visualization was created, which allows you to enter the output data and use an additional parity bit. After encoding the codeword, it is possible to change one bit of the encoded message (simulating an error). This is followed by the decoding process, where the visualization shows us how the incorrectly encoded bit is eliminated. Tests are introduced that automatically check whether encoding and decoding have been implemented correctly on sample data. You can choose the pace of visualization with an intuitive slider. In the second semester Reed-Solomon code visualisation was implemented along with suitable tests. Changing language to English also has been added.

MAIN FEATURES, FUTURE WORKS:

MAIN FEATURES:

The solution allows you to understand in an accessible way how redundant coding (Hamming code, Reed-Solomon code) works, visualizing both the encoding and decoding process. Thanks to the ability to choose your own code message, changing bit in coded message, selecting the animation pace, the user is provided with personalization and the ability to adapt the application to his or her problem. Due to English translation application is also available for foreigners.