Logo

Description automatically generated

Logo

Description automatically generated

**Department of Information Engineering and Computer Science**

Bachelor’s Degree in

Computer Science

Development of a GUI for the

Packet Loss Concealment

Testbench Tool

|  |  |
| --- | --- |
| *Prof. Luca Turchet*  *Ph.D. Luca Vignati* | *Stefano Dallona*  *MATR. 113898* |
|  |  |

2022/2023

To my wife and to my daughters

who constantly supported me during this journey

Table of Contents

[Abstract 4](#_Toc130577124)

[Introduction 4](#_Toc130577125)

[Purpose 4](#_Toc130577126)

[Domain (Real-time streaming of audio data excluding speech) 4](#_Toc130577127)

[Literature Review 4](#_Toc130577128)

[Digital Audio Fundamentals 4](#_Toc130577129)

[What is a Sound Wave? 4](#_Toc130577130)

[How can it be represented in a digital format? 4](#_Toc130577131)

[How can the information be stored? 4](#_Toc130577132)

[Packet Loss 4](#_Toc130577133)

[Packet Loss 4](#_Toc130577134)

[Packet Loss Simulation 4](#_Toc130577135)

[Packet Loss Concealment 4](#_Toc130577136)

[Methods 4](#_Toc130577137)

[Adapted languages: Python and Javascript 4](#_Toc130577138)

[Project architecture 4](#_Toc130577139)

[Web GUI 4](#_Toc130577140)

[UI main functions 4](#_Toc130577141)

[Configuration of the input data 4](#_Toc130577142)

[Execution management monitoring 4](#_Toc130577143)

[Output analysis 4](#_Toc130577144)

[Technical choices (Frameworks) 4](#_Toc130577145)

[Application Containerization for scalabilty 4](#_Toc130577146)

[Results 4](#_Toc130577147)

[Validation of PLC-TestBench tool 4](#_Toc130577148)

[Extension of the tool usability 4](#_Toc130577149)

[User experience 4](#_Toc130577150)

[Discussion 4](#_Toc130577151)

[Future Developments 4](#_Toc130577152)

[Conclusion 4](#_Toc130577153)

[Bibliography 4](#_Toc130577154)

# Abstract

# Introduction

## Purpose

## Domain (Real-time streaming of audio data excluding speech)

# Literature Review

## Digital Audio Fundamentals

### What is a Sound Wave?

### How can it be represented in a digital format?

### How can the information be stored?

## Packet Loss

### Packet Loss

### Packet Loss Simulation

### Packet Loss Concealment

#### Packet Loss Algorithms

# Methods

## Adapted languages: Python and Javascript

## Project architecture

## Web GUI

## UI main functions

### Configuration of the input data

### Execution management monitoring

### Output analysis

## Technical choices (Frameworks)

## Application Containerization for scalabilty

# Results

## Validation of PLC-TestBench tool

## Extension of the tool usability

## User experience

# Discussion

## Future Developments

# Conclusion

# Bibliography