

UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA



MASTER THESIS IN COMPUTER ENGINEERING

## An interesting title for the thesis

MASTER CANDIDATE

**Luca Martinelli**

Student ID 1518036

SUPERVISOR

**Prof. Tim Berners-Lee**

University of Padova

Co-SUPERVISOR

**Dott. Robert Kahn**

University of Princeton

ACADEMIC YEAR  
2021/2022



*To my parents  
and friends*



## **Abstract**



## **Sommario**



# Contents

|                                       |             |
|---------------------------------------|-------------|
| <b>List of Figures</b>                | <b>xi</b>   |
| <b>List of Tables</b>                 | <b>xiii</b> |
| <b>List of Algorithms</b>             | <b>xvii</b> |
| <b>List of Code Snippets</b>          | <b>xvii</b> |
| <b>List of Acronyms</b>               | <b>xix</b>  |
| <b>1 Introduction</b>                 | <b>1</b>    |
| 1.1 A section . . . . .               | 1           |
| 1.1.1 A subsection . . . . .          | 1           |
| <b>2 Background</b>                   | <b>3</b>    |
| <b>3 Analysis</b>                     | <b>5</b>    |
| 3.1 A section . . . . .               | 5           |
| <b>4 Conclusions and Future Works</b> | <b>7</b>    |
| <b>References</b>                     | <b>9</b>    |
| <b>Acknowledgments</b>                | <b>11</b>   |



# List of Figures

|                                       |   |
|---------------------------------------|---|
| 3.1 Image created with TikZ . . . . . | 5 |
|---------------------------------------|---|



# List of Tables

|                             |   |
|-----------------------------|---|
| 4.1 Table example . . . . . | 7 |
|-----------------------------|---|



# List of Algorithms

|   |                                     |   |
|---|-------------------------------------|---|
| 1 | An algorithm with caption . . . . . | 3 |
|---|-------------------------------------|---|



# List of Code Snippets

|     |                      |       |   |
|-----|----------------------|-------|---|
| 3.1 | Code snippet example | ..... | 5 |
|-----|----------------------|-------|---|



# List of Acronyms

**CSV** Comma Separated Values



# 1

## Introduction

Random citation [1].

Random footnote.<sup>1</sup>

### 1.1 A SECTION

#### EXAMPLE OF LIST

- Item 1
- Item 2

#### 1.1.1 A SUBSECTION

#### EXAMPLE OF ACRONYM

Comma Separated Values (CSV)

#### EXAMPLE OF ENUMERATION

1. Item 1
2. Item 2

---

<sup>1</sup><https://lucamartinelli.eu.org>

## 1.1. A SECTION

### EXAMPLE OF QUOTE

*Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.*

  Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

# 2

## Background

---

**Algorithm 1** An algorithm with caption

---

**Require:**  $n \geq 0$

**Ensure:**  $y = x^n$

$y \leftarrow 1$

$X \leftarrow x$

$N \leftarrow n$

**while**  $N \neq 0$  **do**

**if**  $N$  is even **then**

$X \leftarrow X \times X$

$N \leftarrow \frac{N}{2}$  {This is a comment}

**else if**  $N$  is odd **then**

$y \leftarrow y \times X$

$N \leftarrow N - 1$

**end if**

**end while**

---

$$e^{j\pi} + 1 = 0 \quad (2.1)$$



# 3

## Analysis

### 3.1 A SECTION

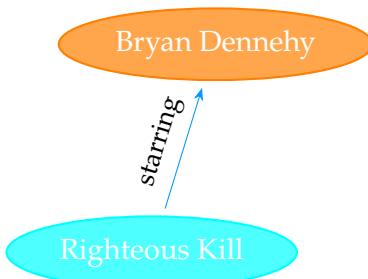


Figure 3.1: Image created with TikZ

  Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

```
1 import numpy as np
2
3 def incmatrix(genl1,genl2):
4     m = len(genl1)
5     n = len(genl2)
6     M = None #to become the incidence matrix
```

### 3.1. A SECTION

```
7  VT = np.zeros((n*m, 1), int) #dummy variable
8
9  test = "String"
10
11 #compute the bitwise xor matrix
12 M1 = bitxormatrix(genl1)
13 M2 = np.triu(bitxormatrix(genl2), 1)
14
15 for i in range(m-1):
16     for j in range(i+1, m):
17         [r,c] = np.where(M2 == M1[i,j])
18         for k in range(len(r)):
19             VT[(i)*n + r[k]] = 1;
20             VT[(i)*n + c[k]] = 1;
21             VT[(j)*n + r[k]] = 1;
22             VT[(j)*n + c[k]] = 1;
23
24         if M is None:
25             M = np.copy(VT)
26         else:
27             M = np.concatenate((M, VT), 1)
28
29         VT = np.zeros((n*m, 1), int)
30
31 return M
```

Code 3.1: Code snippet example

# 4

## Conclusions and Future Works

|   |   |
|---|---|
| A | B |
| C | D |
| E | F |
| G | H |

Table 4.1: Table example



# References

- [1] Marco Alecci et al. “Development of an IR System for Argument Search.” In: *CLEF (Working Notes)*. 2021, pp. 2302–2318.



# Acknowledgments