



Hochschule  
Bonn-Rhein-Sieg  
University of Applied Sciences



# Lifelong Action Learning for Socially Assistive Robots

November 25th, 2022

Hasnainali Walli

*Advisors*

Prof. Dr. Paul G. Plöger, Prof. Dr. Sebastian Houben, Alex Mitrevski

## 1. First section

### 1.1 A subsection

### 1.2 Structuring Elements

### 1.3 Numerals and Mathematics

### 1.4 Figures and Code Listings

### 1.5 Citations and Bibliography

## 2. Something else



## 1. First section

### 1.1 A subsection

### 1.2 Structuring Elements

### 1.3 Numerals and Mathematics

### 1.4 Figures and Code Listings

### 1.5 Citations and Bibliography

## 2. Something else

# Jabberwocky

*Lewis Carroll*

'Twas brillig, and the slithy toves  
Did gyre and gimble in the wabe;  
All mimsy were the borogoves,  
And the mome raths outgrabe.

“Beware the Jabberwock, my son!  
The jaws that bite, the claws that catch!  
Beware the Jubjub bird, and shun  
The frumious Bandersnatch!”

# Lists and locales

*Lorem ipsum dolor sit amet*

- Nulla nec lacinia odio. Curabitur urna tellus.
  - Fusce id sodales dolor. Sed id metus dui.
    - » Cupio virtus licet mi vel feugiat.

1. Donec porta, risus porttitor egestas scelerisque video.
  - 1.1 Nunc non ante fringilla, manus potentis cario.
    - 1.1.1 Pellentesque servus morbi tristique.

Nechť již hříšné saxofony d'áblů rozzvučí síň úděsnými tóny waltzu, tanga a quickstepu! Nezvyčajné krdle šťastných figliarskych d'atľov učia pri kótovanom ústí Váhu mĺkveho koňa Waldemara obžierať väčšie kusy exkluzívnej kôry. The quick, brown fox jumps over a lazy dog. DJs flock by when MTV ax quiz prog. "Now fax quiz Jack!"

## 1. First section

1.1 A subsection

### 1.2 Structuring Elements

1.3 Numerals and Mathematics

1.4 Figures and Code Listings

1.5 Citations and Bibliography

## 2. Something else



# Text blocks

*In plain, example, and **alert** flavour*

**This text** is highlighted.

A plain block

This is a plain block containing some **highlighted text**.

An example block

This is an example block containing some **highlighted text**.

An alert block

This is an alert block containing some **highlighted text**.

# Definitions, theorems, and proofs

*All integers divide zero*

## Definition

$$\forall a, b \in \mathbb{Z} : a \mid b \iff \exists c \in \mathbb{Z} : a \cdot c = b$$

## Theorem

$$\forall a \in \mathbb{Z} : a \mid 0$$

## Proof

$$\forall a \in \mathbb{Z} : a \cdot 0 = 0$$





## 1. First section

1.1 A subsection

1.2 Structuring Elements

**1.3 Numerals and Mathematics**

1.4 Figures and Code Listings

1.5 Citations and Bibliography

## 2. Something else



# Numerals and Mathematics

*Formulae, equations, and expressions*

1234567890

1234567890

$\hat{x}, \check{x}, \tilde{a}, \bar{a}, \dot{y}, \ddot{y}$

$\iint f(x, y, z) \, dx dy dz$

$$\frac{1}{1 + \frac{1}{2 + \frac{1}{3 + x}}} + \frac{1}{1 + \frac{1}{2 + \frac{1}{3 + x}}}$$

$$F : \begin{vmatrix} F''_{xx} & F''_{xy} & F'_x \\ F''_{yx} & F''_{yy} & F'_y \\ F'_x & F'_y & 0 \end{vmatrix} = 0$$

$$\iint_{\mathbf{x} \in \mathbb{R}^2} \langle \mathbf{x}, \mathbf{y} \rangle \, d\mathbf{x}$$

$$\overline{\overline{a\alpha^2 + b\beta + d\delta}}$$

$$]0, 1[ + \lceil x \rceil - \langle x, y \rangle$$

$$e^x \approx 1 + x + x^2/2! + x^3/3! + x^4/4!$$

$$\binom{n+1}{k} = \binom{n}{k} + \binom{n}{k-1}$$

## 1. First section

1.1 A subsection

1.2 Structuring Elements

1.3 Numerals and Mathematics

**1.4 Figures and Code Listings**

1.5 Citations and Bibliography

## 2. Something else



# Figures

*Tables, graphs, and images*

Faculty	With T <sub>E</sub> X	Total	%
Faculty of Informatics	1 716	2 904	59.09
Faculty of Science	786	5 275	14.90
Faculty of Economics and Administration	64	4 591	1.39
Faculty of Arts	69	10 000	0.69
Faculty of Medicine	8	2 014	0.40
Faculty of Law	15	4 824	0.31
Faculty of Education	19	8 219	0.23
Faculty of Social Studies	12	5 599	0.21
Faculty of Sports Studies	3	2 062	0.15

Table 1: The distribution of theses written using T<sub>E</sub>X during 2010–15 at MU

# Figures

*Tables, graphs, and images*

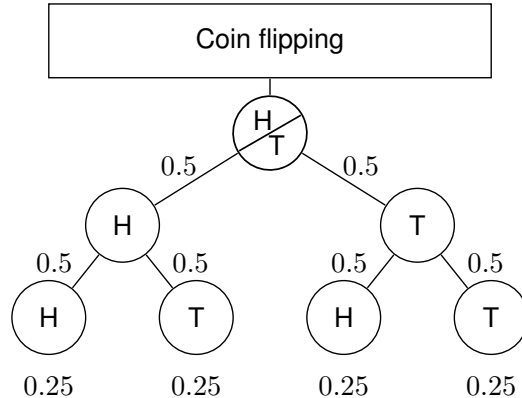


Figure 1: Tree of probabilities – Flipping a coin<sup>1</sup>

# Code listings

*An example source code in C*

```
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

// This is a comment
int main(int argc, char **argv)
{
    while (--c > 1 && !fork());
    sleep(c = atoi(v[c]));
    printf("%d\n", c);
    wait(0);
    return 0;
```

## 1. First section

1.1 A subsection

1.2 Structuring Elements

1.3 Numerals and Mathematics

1.4 Figures and Code Listings

1.5 Citations and Bibliography

## 2. Something else



# Citations

*T<sub>E</sub>X*, L<sup>A</sup>T<sub>E</sub>X, and Beamer

T<sub>E</sub>X is a programming language for the typesetting of documents. It was created by Donald Erwin Knuth in the late 1970s and it is documented in [The T<sub>E</sub>Xbook](#) [1].






In the early 1980s, Leslie Lamport created the initial version of L<sup>A</sup>T<sub>E</sub>X, a high-level language on top of T<sub>E</sub>X, which is documented in [L<sup>A</sup>T<sub>E</sub>X: A Document Preparation System](#) [2]. There exists a healthy ecosystem of packages that extend the base functionality of L<sup>A</sup>T<sub>E</sub>X; [The L<sup>A</sup>T<sub>E</sub>X Companion](#) [3] acts as a guide through the ecosystem.

In 2003, Till Tantau created the initial version of Beamer, a L<sup>A</sup>T<sub>E</sub>X package for the creation of presentations. Beamer is documented in the [User's Guide to the Beamer Class](#) [4].



# Bibliography

*T<sub>E</sub>X*, L<sup>A</sup>T<sub>E</sub>X, and Beamer

-  Donald E. Knuth. **The T<sub>E</sub>Xbook**. Addison-Wesley, 1984.
-  Leslie Lamport. **L<sup>A</sup>T<sub>E</sub>X: A Document Preparation System**. Addison-Wesley, 1986.
-  M. Goossens, F. Mittelbach, and A. Samarin. **The L<sup>A</sup>T<sub>E</sub>X Companion**. Addison-Wesley, 1994.
-  Till Tantau. **User's Guide to the Beamer Class Version 3.01**. Available at <http://latex-beamer.sourceforge.net>.
-  A. Mertz and W. Slough. Edited by B. Beeton and K. Berry. **Beamer by example** In TUGboat, Vol. 26, No. 1., pp. 68-73.

## 1. First section

### 1.1 A subsection

### 1.2 Structuring Elements

### 1.3 Numerals and Mathematics

### 1.4 Figures and Code Listings

### 1.5 Citations and Bibliography

## 2. Something else

# There Is No Largest Prime Number

*The proof uses reductio ad absurdum.*

## Theorem

*There is no largest prime number.*

1. Suppose  $p$  were the largest prime number.
2. Consider the number  $p + 1$ .
3.  $p + 1$  is greater than 1, thus divisible by some prime number not in the first  $p$  numbers.
4. But  $q + 1$  is greater than 1, thus divisible by some prime number not in the first  $p$  numbers.

# There Is No Largest Prime Number

*The proof uses reductio ad absurdum.*

## Theorem

*There is no largest prime number.*

1. Suppose  $p$  were the largest prime number.
2. Let  $q$  be the product of the first  $p$  numbers.
3.  $q + 1$  is greater than 1, thus divisible by some prime number not in the first  $p$  numbers.
4. But  $q + 1$  is greater than 1, thus divisible by some prime number not in the first  $p$  numbers.

# There Is No Largest Prime Number

*The proof uses reductio ad absurdum.*

## Theorem

*There is no largest prime number.*

1. Suppose  $p$  were the largest prime number.
2. Let  $q$  be the product of the first  $p$  numbers.
3. Then  $q + 1$  is not divisible by any of them.
4. But  $q + 1$  is greater than 1, thus divisible by some prime number not in the first  $p$  numbers.

# A longer title

- one
- two

**This is a test of bold text**

# Test (1/2)

First slide

- 
- 
- 
- 
- 



# Test (2/2)

## Second slide

- 
- 
- 
- 
-