FACULTAD DE INGENIERIA
Universidad de Buenos Aires

Analisis de señales

Clase 1 - Introducción

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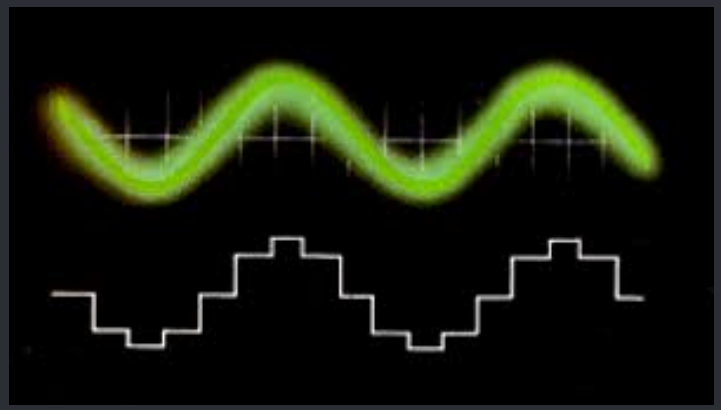
Outline for Section 1

Porque digital?

Digital vs analogico

- Digital
  - Reproducibilidad
  - Tolerancia de componentes
  - Partidas todas iguales
  - Componentes no envejecen
  - Facil de actualizar
  - Soluciones de un solo chip
- Analogico
  - Alto ancho de banda
  - Alta potencia



Señales y sistemas

Que son?

Señal

Una señal, en función de una o más variables, puede definirse como un cambio observable en una entidad cuantificable

Sistema

Un sistema es cualquier conjunto físico de componentes que actúan en una señal, tomando una o más señales de entrada, y produciendo una o más señales de salida.

Señales y sistemas

Tipos de señales

- Tiempo continuo y señales de tiempo discreto
- Señales deterministas y no deterministas
- Señales pares e impares
- Señales periódicas y aperiódicas
- Energía y señales de energía
- Señales reales e imaginarias

listas y columnas

Que es una señal?

- Una señal, en función de una o más variables, puede definirse como un cambio observable en una entidad cuantificable
  - 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.

The quick, brown fox jumps over a lazy dog. DJs flock by when MTV ax quiz prog. “Now fax quiz Jack!”

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

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

Numerals and Mathematics

Formulae, equations, and expressions

$$1234567890 \quad 1234567890 \quad \hat{x}, \check{x}, \tilde{a}, \bar{a}, \dot{y}, \ddot{y} \quad \iint f(x, y, z)\,\mathrm{d}x\mathrm{d}y\mathrm{d}z$$

$$\frac{1}{1+\cfrac{1}{2+\cfrac{1}{3+x}}} + \frac{1}{1+\cfrac{1}{2+\cfrac{1}{3+x}}} \qquad F : \begin{vmatrix} F''_{xx} & F''_{xy} & F'_x \\ F''_{yx} & F''_{yy} & F'_y \\ F'_x & F'_y & 0 \end{vmatrix} = 0$$

$$\iint_{\mathbf{x}\in\mathbb{R}^2} \langle \mathbf{x}, \mathbf{y} \rangle \,\mathrm{d}\mathbf{x} \qquad \overline{\overline{a\alpha}^2 + \underline{b\beta} + \overline{\overline{d\delta}}} \qquad]0,1[+ \lceil x \rceil - \langle x, y \rangle$$

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

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

Figures

Tables, graphs, and images

Faculty	With TEX	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

Cuadro: The distribution of theses written using TEX during 2010–15 at MU

Figures

Tables, graphs, and images

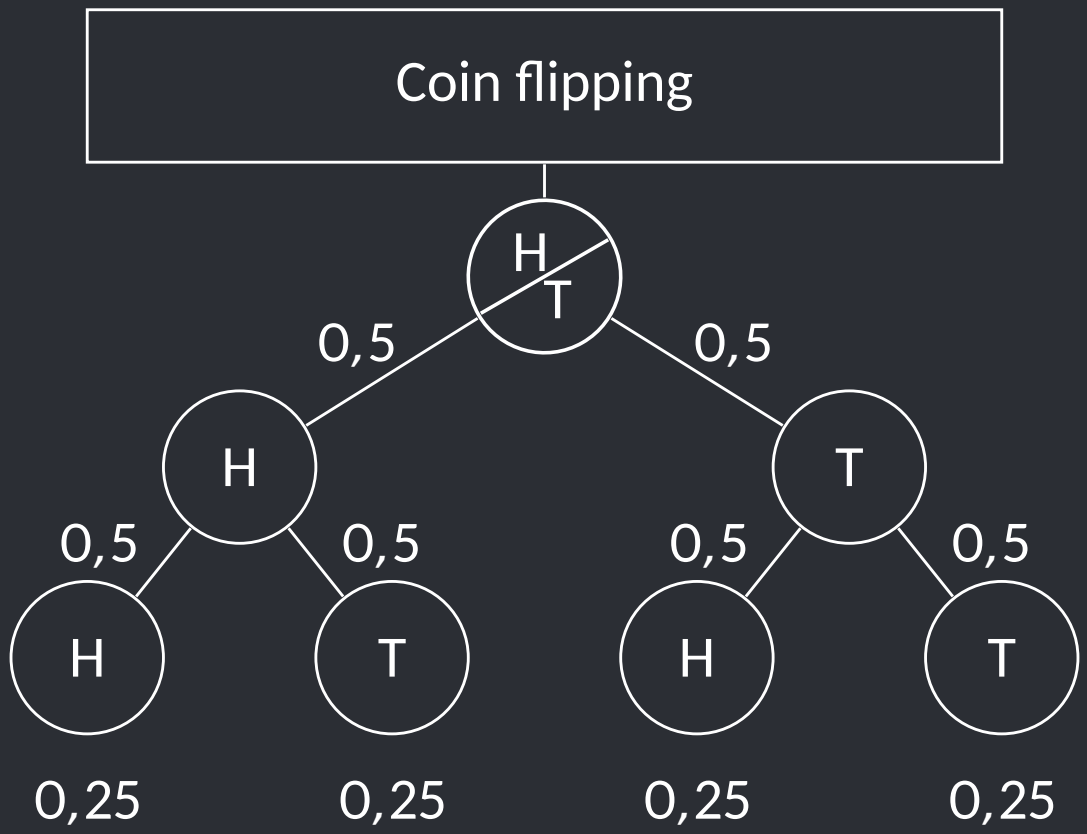


Figura: Tree of probabilities – Flipping a coin[1]

[1] A derivative of a diagram from `texample.net` by cis, CC BY 2.5 licensed

Code listings

An example source code in C

```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;
}
```

Citations

TEX, LATEX, and Beamer

TEX 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 TEXbook* [1].
In the early 1980s, Leslie Lamport created the initial version of LATEX, a high-level language on top of TEX, which is documented in *LATEX: A Document Preparation System* [2]. There exists a healthy ecosystem of packages that extend the base functionality of LATEX; *The LATEX Companion* [3] acts as a guide through the ecosystem.
In 2003, Till Tantau created the initial version of Beamer, a LATEX package for the creation of presentations. Beamer is documented in the *User's Guide to the Beamer Class* [4].

Bibliography

TEX, LATEX, and Beamer

[1] Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984.

[2] Leslie Lamport. *LATEX: A Document Preparation System*. Addison-Wesley, 1986.

[3] M. Goossens, F. Mittelbach, and A. Samarin. *The LATEX Companion*. Addison-Wesley, 1994.

[4] Till Tantau. *User's Guide to the Beamer Class Version 3.01*. Available at `http://latex-beamer.sourceforge.net`.

[5] A. Mertz and W. Slough. Edited by B. Beeton and K. Berry. *Beamer by example* In TUGboat, Vol. 26, No. 1., pp. 68-73.