

Interacção Humana com o Computador



Departamento de Informática
UBI 2024/2025

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X

▼ Geral

Anúncios

▼ Objetivos

> Aulas Teóricas

> Aulas Práticas

INTERACAO HUMANA COM O COMPUTADOR

Disciplina

Configurações

Participantes

Pauta

Relatórios

Mais ▾

▼ Geral

Contrair tudo



Anúncios

▼ Objetivos

Nesta unidade curricular serão estudados conceitos inerentes à interação homem-máquina, quer a um nível mais conceptual e teórico quer a um nível mais prático. Começando com uma análise dos dois principais intervenientes - homem e computador - prosseguir-se-á para o estudo de modelos subjacentes à representação design e implementação de sistemas facilitadores desta interação. Serão analisados os aspetos estéticos e funcionais mais relevantes e relacionados com o design e implementação de sistemas interativos.

Tendo presente o paradigma WIMP e sendo as interfaces gráficas (GUI) ainda uma das principais





IHC - Horário 2024/25

EINF

qui, 6 mar			
14335-PL4	FS	FM 1209	
14346-PL3	CP	0613	
14335-PL4	FS	FM 1209	
14346-PL3	CP	0613	
14346-PL4	CP	0613	
14346-PL4	CP	0613	
14336-PL3	LH	0614	
14346-PL2	JC	0619	
14336-PL3	LH	0614	
14346-PL2	JC	0619	
14346-PL1	JC	0619	
14346-PL1	JC	0619	

IWEB

qui, 27 fev			
16225-PL2	JC	0627	
16225-PL2	JC	0627	
16228-TE1	ÁC	0605	
16228-TE1	ÁC	0605	
16225-PL1	JC	0619	
16228-PL1b	JS	0605	
16225-PL1	JC	0619	
16228-PL1	JS	0605	



Critérios de Avaliação

CEA – Classificação Ensino Aprendizagem.

$$\text{CEA} <--- 60\% * \text{PE} + 30\% * \text{TC} + 10\% * \text{AP}$$

PE: Prova Escrita teórica (frequência);

TC: Trabalho Criativo;

AP: Avaliação Prática.

A Classificação Final (**CF**) à UC será calculada da seguinte forma:

SE (**CEA** \geq 10 valores) **ENTÃO**

CF $<---$ **CEA** e dispensa de exame

SENÃO {

Não dispensa de exame:

CF $<---$ 70% * **Exame** + 30% * **TC**

}

• Em exame de ***melhoria***, conta sempre a melhor nota;

• A **nota mínima** para ir a exame é de **6.00 valores**, sem arredondamento.



Momentos de Avaliação

Prova Escrita (Frequência)

	D	S	T	Q	Q	S	S	D	S	T	Q	Q	S	S	D	S	T	Q	Q	S	S	D	S	T	Q	Q	S	S	D	S	T	Q	Q	S
Setembro	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
Outubro			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Novembro					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Dezembro	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Janeiro			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Fevereiro					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Março					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Abril			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Maio				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Junho	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
Julho		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Agosto				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	29	
Setembro	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
Outubro			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

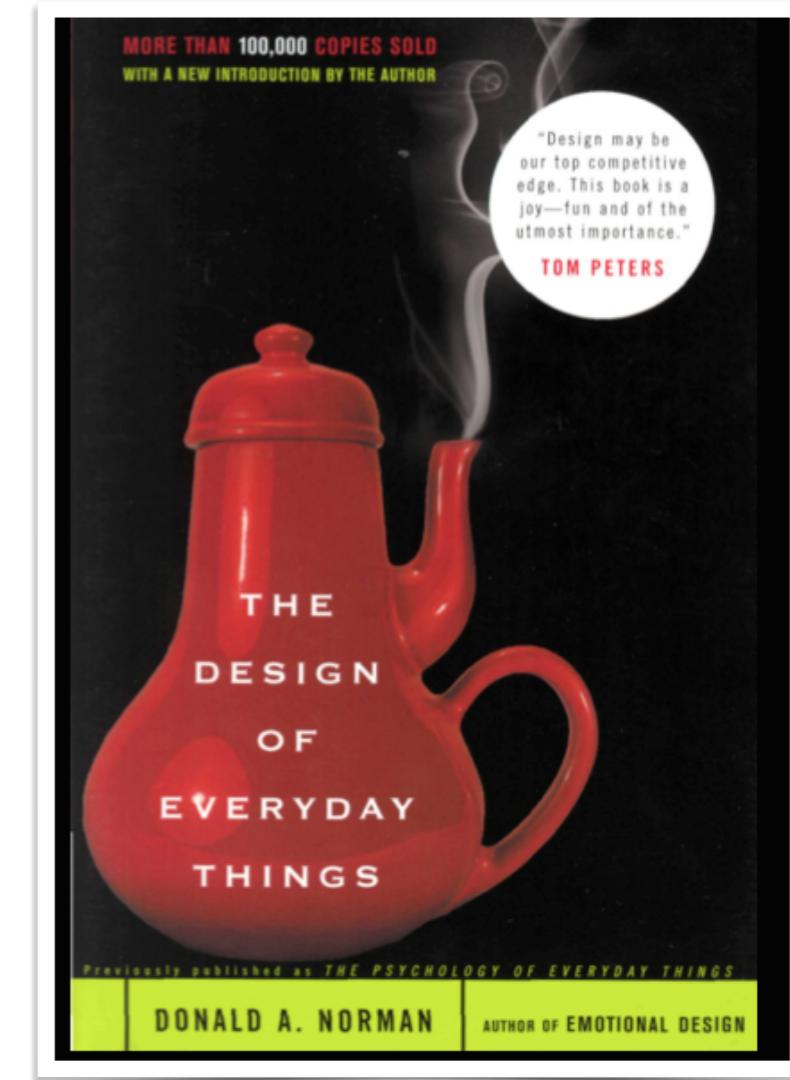
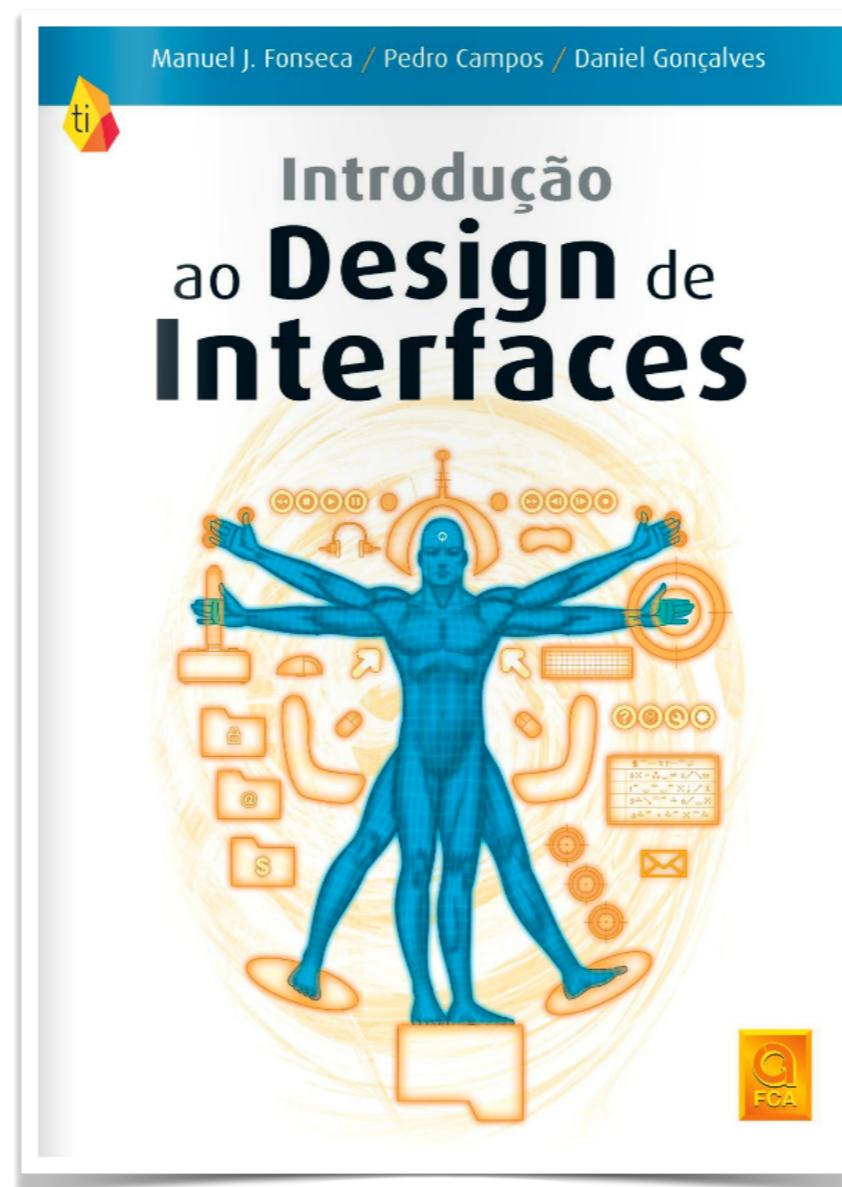
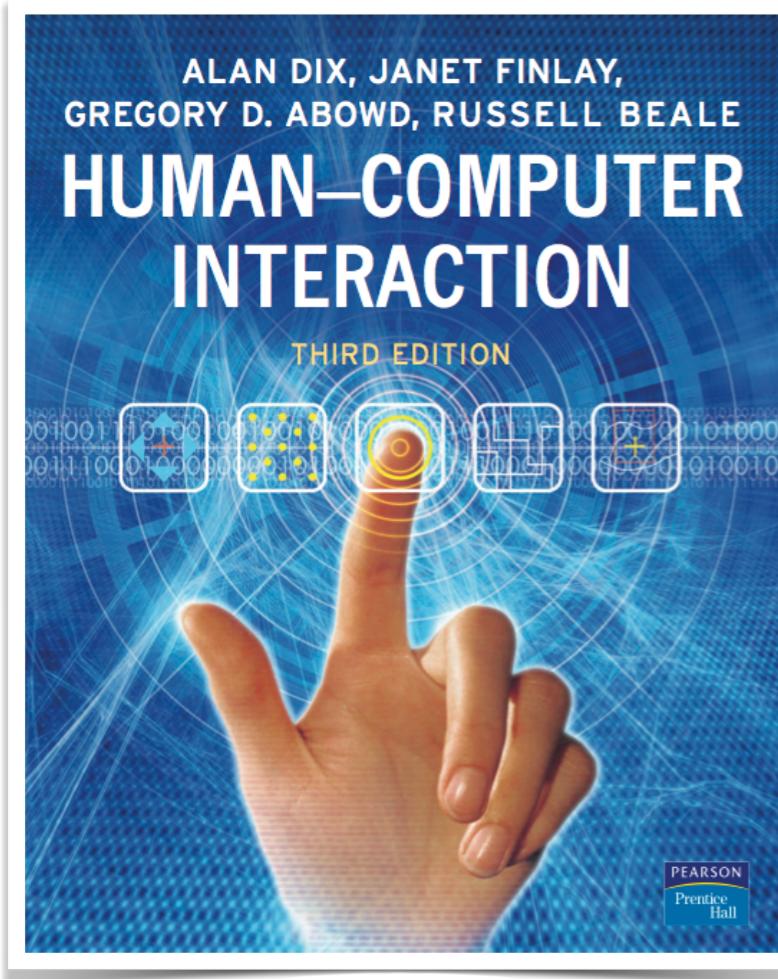
Quinta-feira, 29 de maio, às 18:10

Material de Estudo

Aulas Teóricas



Bibliografia



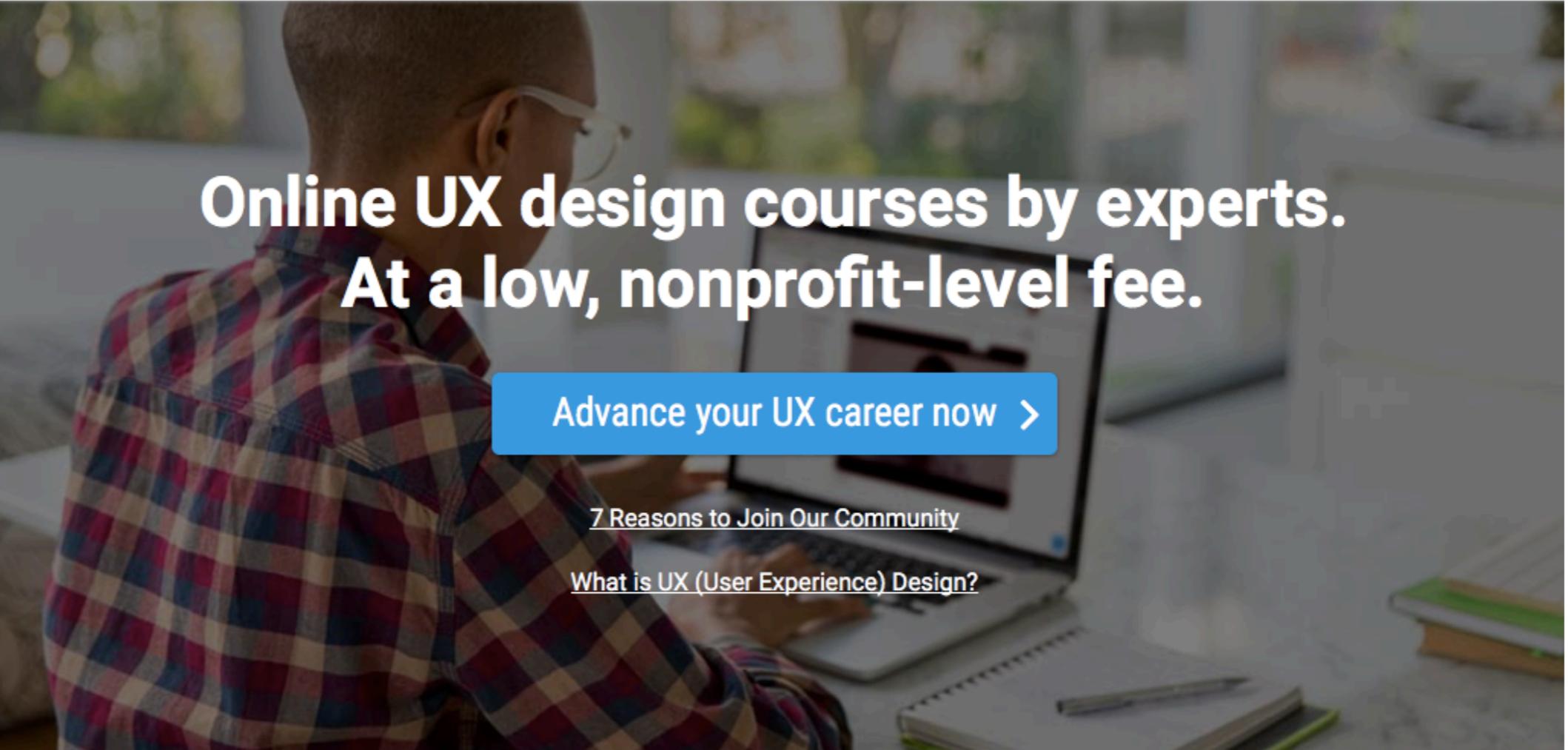


Bibliografia (@WEB)

 INTERACTION DESIGN FOUNDATION

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[7 Reasons to Join Our Community](#)

[What is UX \(User Experience\) Design?](#)

Forbes.com

"Ivy League level education in UX, Product Design or Human-Computer Interaction"

Forbes.com



"A goldmine of information on interaction design"
Don Norman

<https://www.interaction-design.org>



IHC - Programa Teórico

Interacção Humana com o Computador (11565/11107/6627)

Parte I: Fundamentos

1. O Ser Humano
2. O Computador
3. Interacção e Paradigmas

Parte II: Processo de Design

4. IHC no processo de desenvolvimento de software
5. Princípios, regras e normas.
6. Aspectos Estéticos: Cor e Forma.
7. Técnicas de avaliação
8. Design universal e suporte ao utilizador

Parte III: Modelos e Teorias

9. Modelos cognitivos.
10. Análise de tarefas.
11. Modelação de diálogo.
12. Modelação do sistema.

Interação Humana com o Computador ?



IHC - Introdução

*Human-computer interaction is a discipline concerned with the **design**, **evaluation** and **implementation** of interactive computing systems for human use and with the study of major phenomena surrounding them.*



O que é que significa aqui “design”?

Criação da dimensão interativa dos sistemas.



IHC - The big picture

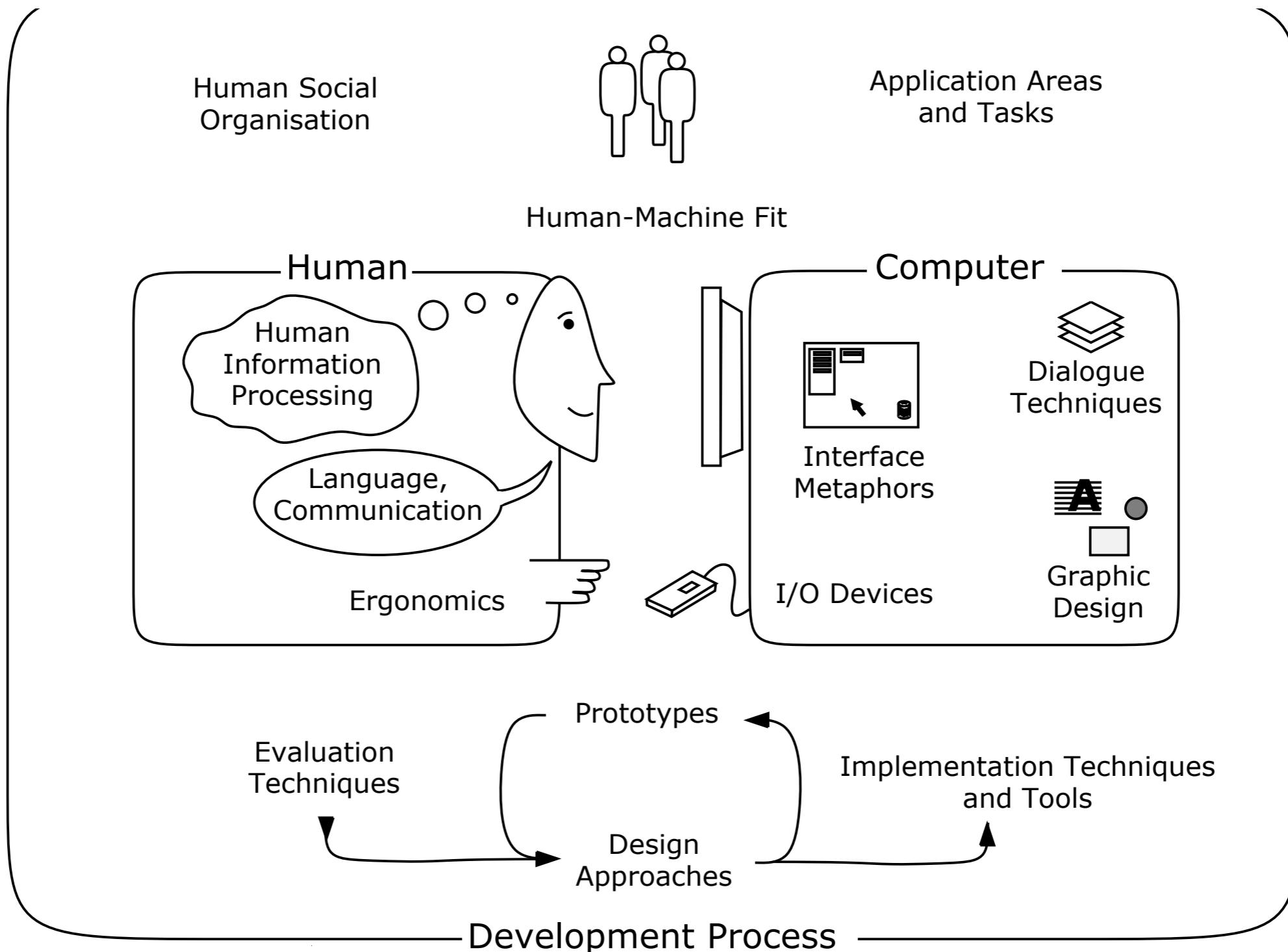


Figure 1.1: The nature of Human-Computer Interaction. Adapted from Figure 1 of the ACM SIGCHI Curricula for Human-Computer Interaction [Hewett et al., 2002]

Our Key Principle

When simple things need pictures, labels, or instructions, the design has failed.

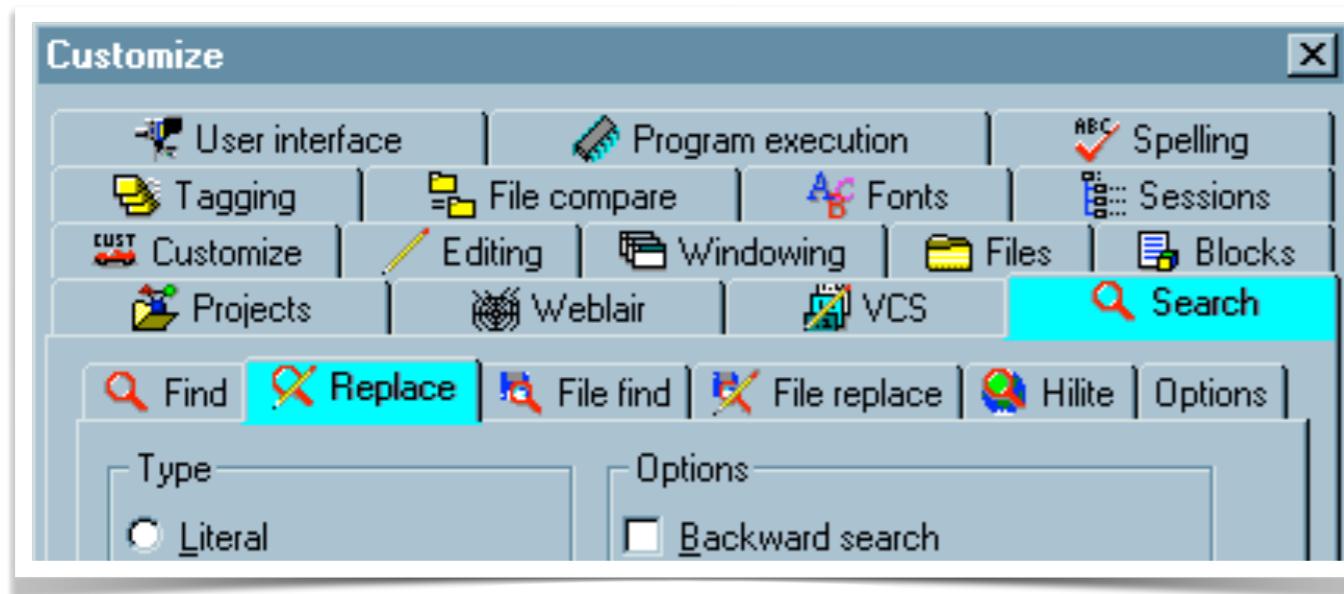


Donald Norman, in *The Design of Everyday Things*, 1988



Preocupações fundamentais

Estética



Forma



Carelman's Convergent Bicycle

Função



Preocupações fundamentais

Forma < Função



A **forma**/estética tem um valor muito importante no design, mas sempre inferior ao valor da **função**/operação!

Em IHC, é a **função** que manda!

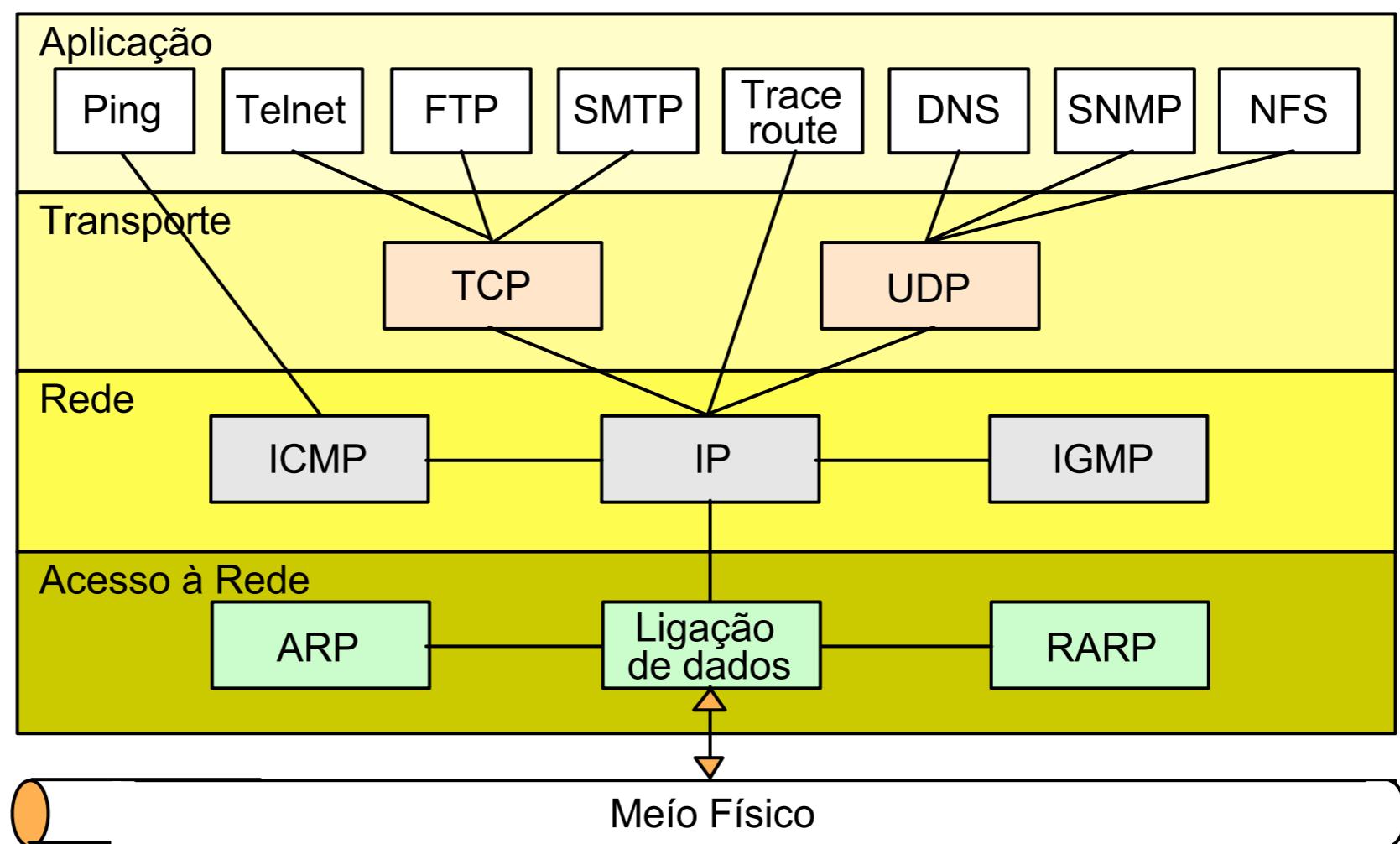
Shoes worn by allied spies during World war II to mislead the Germans and steer them in the opposite direction.



Uma história sobre ...

Forma - Exemplo: World Wide Web

Em 1989 já existe toda a infraestrutura subjacente mas ...





Um história sobre ...

Forma - World Wide Web

Foi então que um cientista do CERN ...
implementou uma interface para navegação
em *hipertexto*.



Tim Berners-Lee

CERN Welcome

CERN

The European Laboratory for Particle Physics, located near Geneva[1] in Switzerland[2] and France[3]. Also the birthplace of the World-Wide Web[4].

This is the CERN laboratory main server. The support team provides a set of Services[5] to the physics experiments and the lab. For questions and suggestions, see WWW Support Contacts[6] at CERN

[About the Laboratory](#)[7] - [Hot News](#)[8] - [Activities](#)[9] - [About Physics](#)[10] - [Other Subjects](#)[11] - [Search](#)[12]

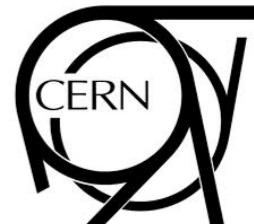
[About the Laboratory](#)

Help[13] and General information[14], divisions, groups and activities[15] (structure), Scientific committees[16]

Directories[17] (phone & email, services & people), Scientific Information Service[18] (library, archives or Alice), Preprint[19] Server

1-45, Back, Up, <RETURN> for more, Quit, or Help: ■

HTTP

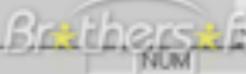




Um história sobre ...

Forma - World Wide Web (@1993)

USA - National Center for Supercomputing Applications.
University of Illinois Urbana-Champaign.

The screenshot shows the NCSA Mosaic for MS Windows application window. The title bar reads "NCSA Mosaic for MS Windows". The menu bar includes "File", "Edit", "Options", "Navigate", "Hotlist", and "Annotate". Below the menu is a toolbar with various icons. The main window displays the NCSA Mosaic homepage. The header of the page features the text "N C S A" above "M O S A I C" with a blue globe icon in the "O". Below it says "X Window System • Microsoft Windows • Macintosh". The main content area contains a welcome message: "Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI." It also mentions "Jan '97" and a note about the Software Development Group's work. There are sections for "NCSA Mosaic Platforms" (listing X Window System, Apple Macintosh, and Microsoft Windows) and "World Wide Web Resources" (listing a glossary, index, access page for disabilities, tutorials, and meta-index). The bottom right corner of the window has the "Brothers.EDU" watermark.



As três keywords da IHC

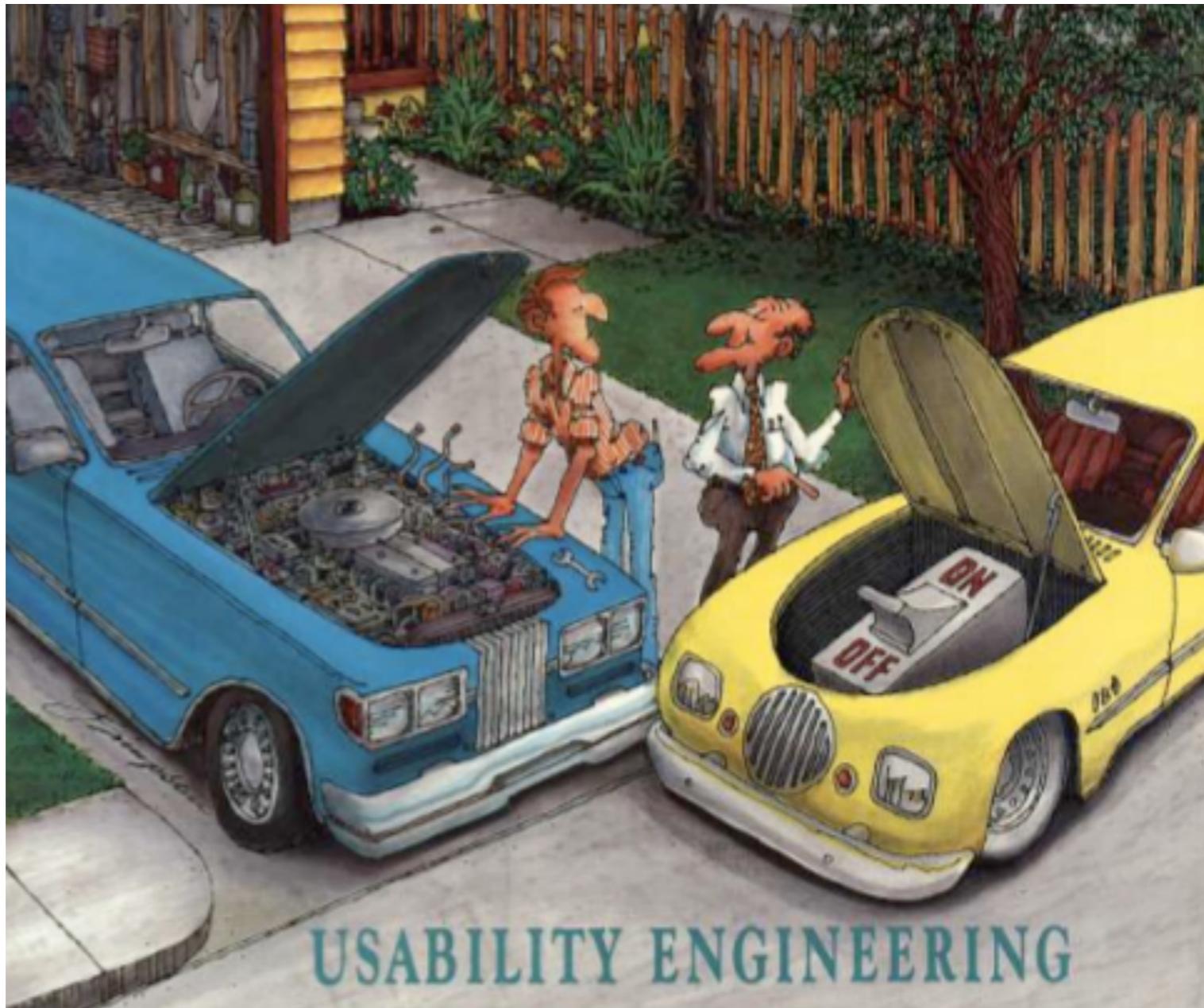
Desejamos um sistema que seja:

- **Útil => eficaz**: cumpre os objetivos;
- **Utilizável => eficiente**: fácil, intuitivo, seguro;
- **Utilizado => atractivo**: agradável e recompensador.



Princípios fundamentais:

Útil



Utilizável

Utilizado



Princípios fundamentais:

- **Útil => eficaz**: cumpre os objetivos;
- **Utilizável => eficiente**: fácil, intuitivo, seguro;
- **Utilizado => atractivio**: agradável e recompensador.





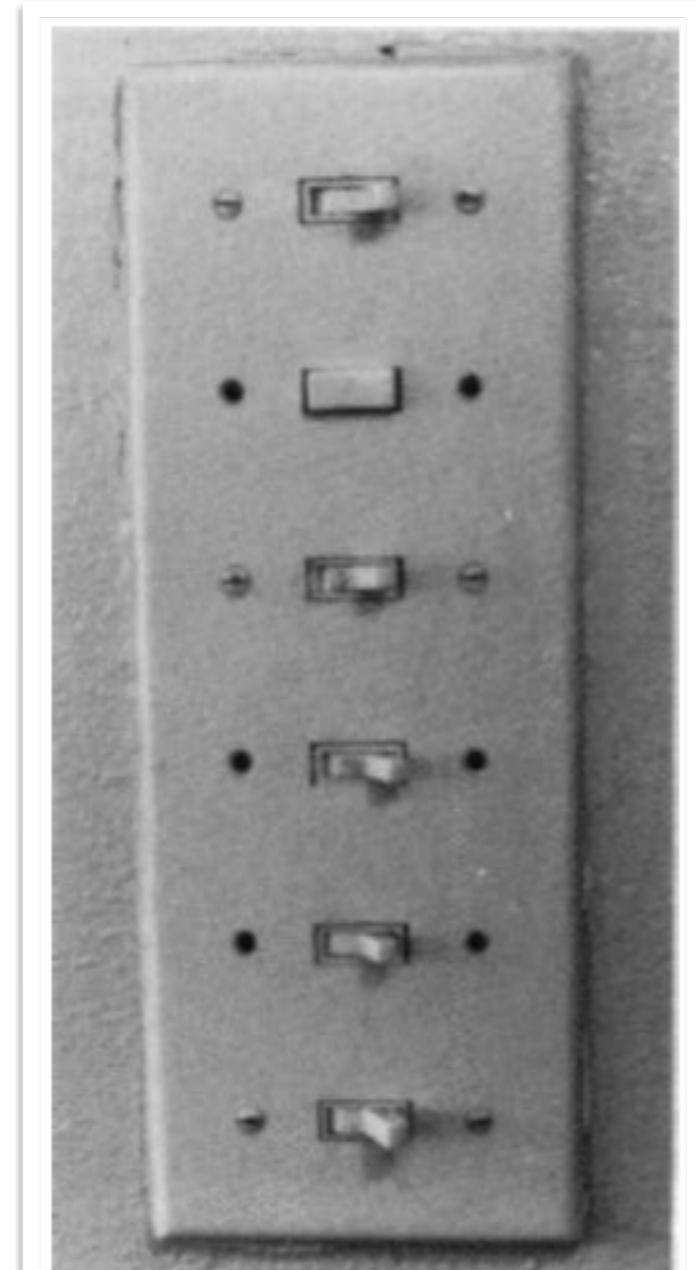
Princípios fundamentais:

Útil, Utilizável, Utilizado

“The Design of Everyday Things”

Donald Norman

4.7 The vertical array of six switches at the right is what our architects provided to control the lights in our odd-shaped living room. We could never remember which switch did what.

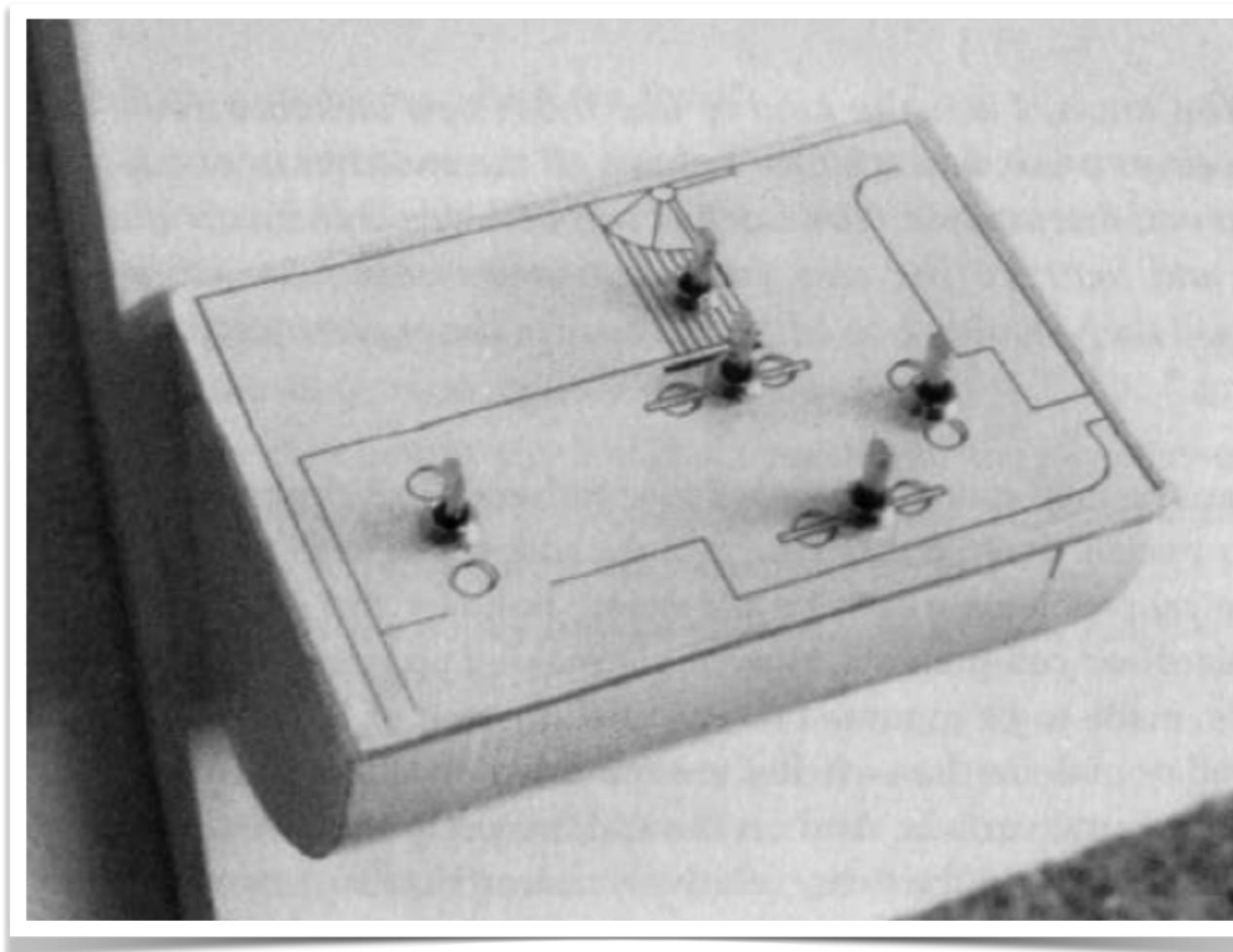




Princípios fundamentais:

Útil, Utilizável, Utilizado

“The Design of Everyday Things”
Donald Norman



4.7 The vertical array of six switches at the right is what our architects provided to control the lights in our odd-shaped living room. We could never remember which switch did what.

The photograph below shows our solution: switches arranged to match the room layout. (One more switch, for a projection screen, will be mounted on the vertical plate just above the light switches. The switch panel was constructed for the author by David Wargo.)



Princípios fundamentais:

Útil, Utilizável, Utilizado

Sistemas Críticos





Um história sobre ...

Função - Three Mile Island, 1 de Abril de 1979



válvula => núcleo a sobre-aquecer => válvula de emergência
=> fuga de vapor de água radioactiva.

- “O principal factor que transformou este incidente numa acidente grave foi a **reacção incorrecta dos operadores**.”
- Nos primeiros minutos soaram entre 100 a 200 alarmes!



In HCI we want tools/systems that:

- Are suitable for the task;
- Are easy to use, appropriate, adaptable to the user's knowledge and experience;
- Provides feedback on performance;
- Display information in a format and at a pace that is adapted to the user;
- Complying with software ergonomics.

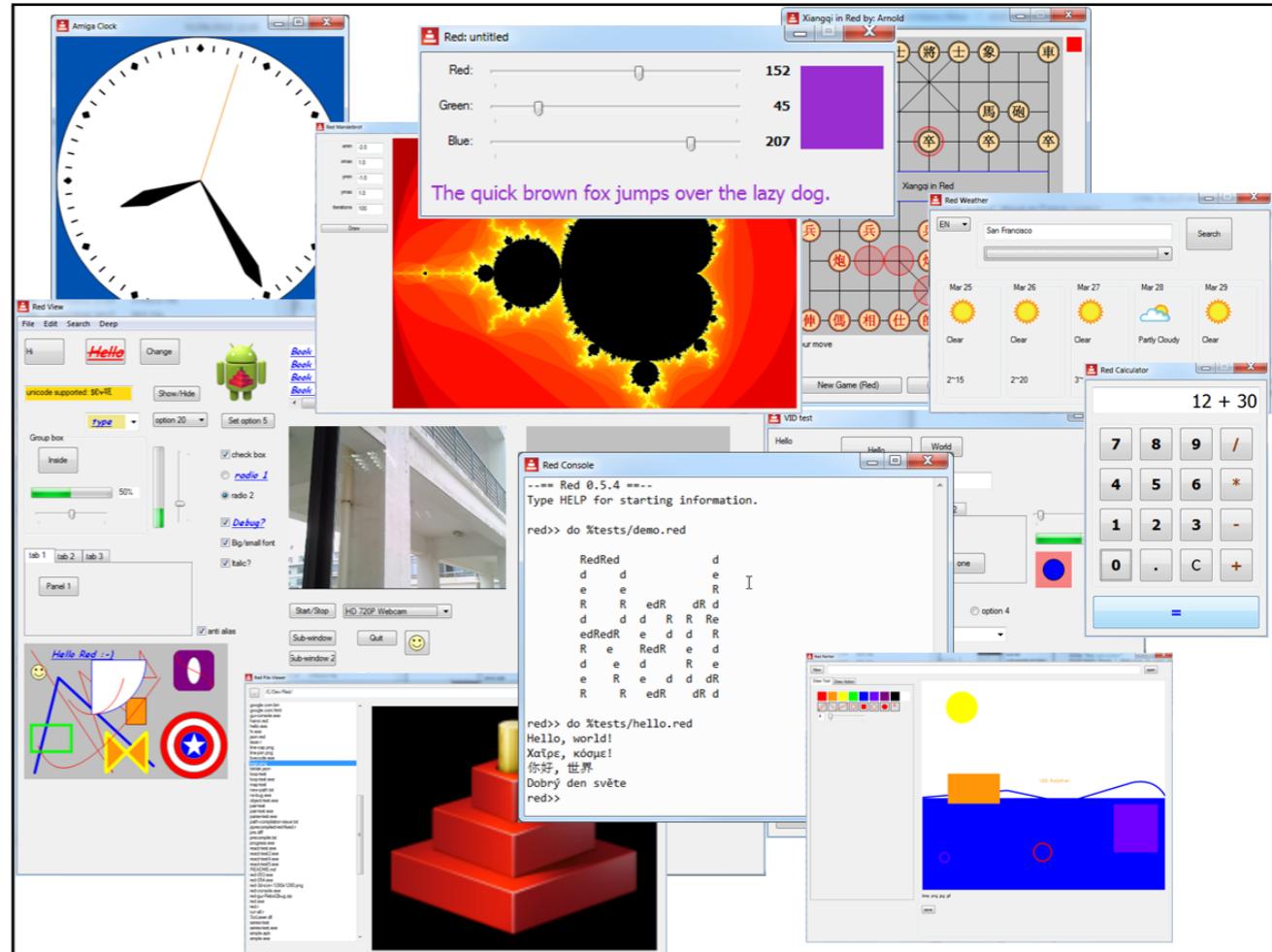
Na Prática,

Vamos fazer exatamente o quê?





Design of Apps with rich GUI





Ferramentas de trabalho

NetBeans Apache NetBeans Plugins Docs & Support Community JavaFX

Apache NetBeans

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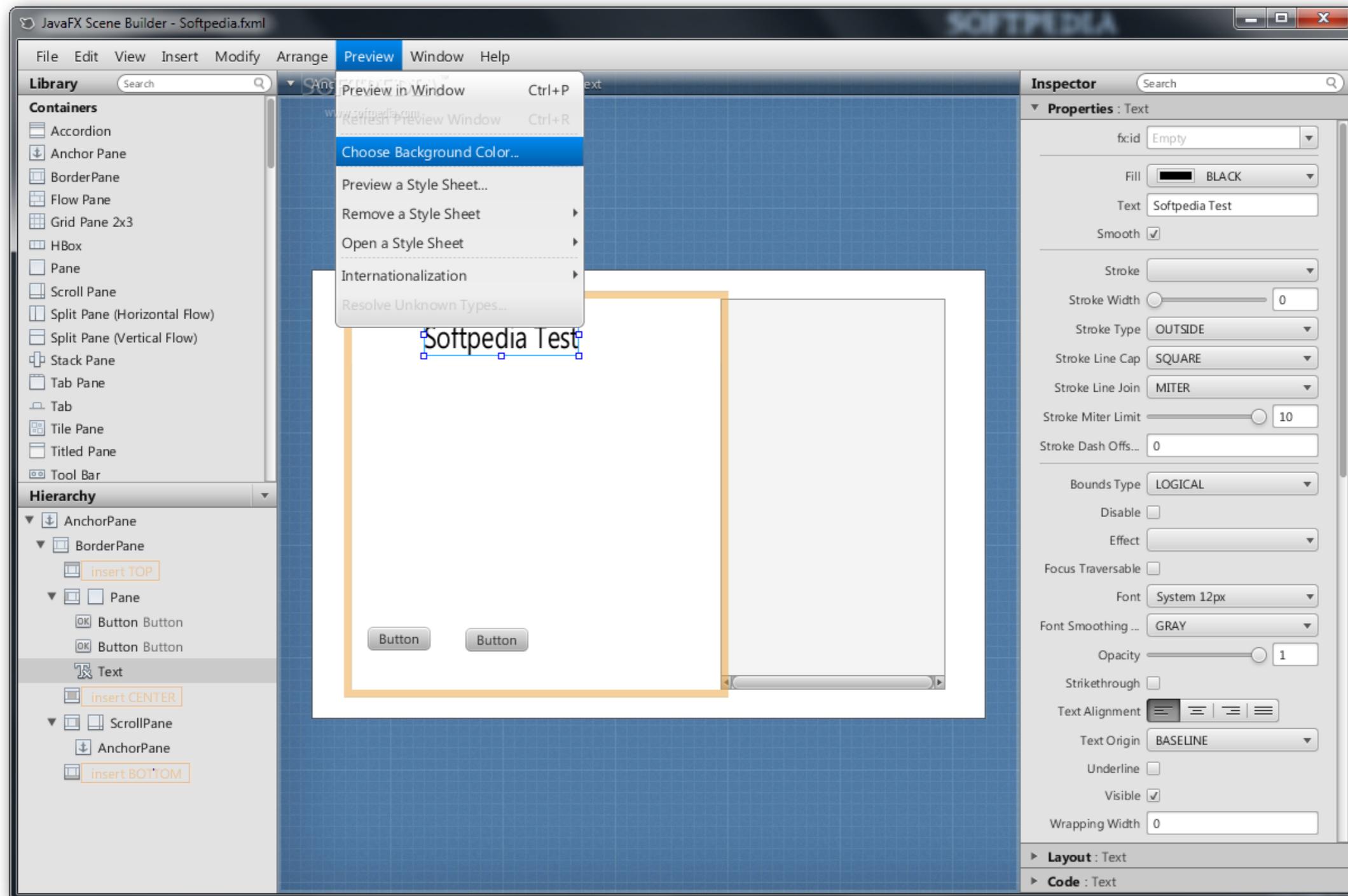
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<http://netbeans.org/>



Ferramentas de trabalho



JavaFX Scene Builder



Ferramentas de trabalho

CalculadoraFX - NetBeans IDE 8.2

Projects Files Services Start Page Main.java FXMLController.java

Source History

```
41     @FXML private Button butMenos;
42     @FXML private Button butVezes;
43     @FXML private Button butDivide;
44
45     @FXML private Button butPonto;
46     @FXML private Button butClear;
47     @FXML private Button butResultado;
48
49     @FXML private Label lblResultado;
50
51     @FXML private TextArea txtArea;
52
53     @FXML
54     private void handleButtonAction(ActionEvent event) {
55         if (event.getSource() instanceof Button) {
56             Button b = (Button) event.getSource();
57             process(b.getText().charAt(0));
58         }
59     }
60
61     @FXML
62     private void handleKeyTyped(KeyEvent event) {
63         char c0 = event.getCharacter().charAt(0);
64         if (c0 == 13 || c0 == 3) c0 = '=';
65         //System.out.printf("[%c] code: %d\n", c0, (int)c0);
66         process(c0);
67     }
68
69 }
```

Projects Navigator

Elements Text

Ids #bevel-grey #big-yellow #dark-blue #glass-grey #green #ipad-dark-grey #ipad-grey #iphone #iphone-toolbar #lion #lion-default #record-sales #rich-blue #round-red #shiny-orange #windows7 #windows7-default

Rules #bevel-grey #big-yellow #big-yellow Text #dark-blue #dark-blue Text

Output 29:32 INS



Ferramentas de trabalho



IntelliJ IDEA



Ferramentas de trabalho

ATriangulo – ATriangulo.java

ATriangulo > src > main > java > pt > ubi > ihm > atriangulo > ATriangulo > start

Project pom.xml (ATriangulo) ATriangulo.java ATriangController.java ATriangView.fxml Maven

ATriangulo ~/Google Drive/UBI/IHC/Code/ATriangulo .idea .mvn out src main java pt ubi ihm atriangulo ATriangController ATriangulo Icon Icon Icon Icon module-info.java resources META-INF pt ubi ihm atriangulo ATriangView.fxml Heron.png Icon trianb.gif Icon Icon Icon Icon target .gitignore

```
1 package pt.ubi.ihm.atriangulo;
2
3 import javafx.application.Application;
4 import javafx.fxml.FXMLLoader;
5 import javafx.scene.Parent;
6 import javafx.scene.Scene;
7 import javafx.scene.control.TextField;
8 import javafx.stage.Stage;
9
10 /**
11 * @author john
12 */
13
14 public class ATriangulo extends Application {
15     static String sa;
16     static String sb;
17     static String sc;
18
19     @Override
20     public void start(Stage stage) throws Exception {
21         Parent root = FXMLLoader.load(getClass().getResource("ATriangView.fxml"));
22         Scene scene = new Scene(root);
23         TextField tfa= (TextField)root.lookup("#ladoA");
24         TextField tfb= (TextField)root.lookup("#ladoB");
25         TextField tfc= (TextField)root.lookup("#ladoC");
26         tfa.setText(sa);
27         tfb.setText(sb);
28         tfc.setText(sc);
29     }
30 }
```

Bookmarks Notifications

Structure Version Control TODO Problems Terminal Services Build Dependencies

Typo: In word 'Área'

31:27 LF UTF-8 4 spaces

IntelliJ IDEA



Ferramentas de trabalho

Screenshot of the IntelliJ IDEA IDE interface, showing the development of a JavaFX application for calculating the area of a triangle using Heron's formula.

The project structure shows files like `pom.xml`, `ATriangulo.java`, `ATriangController.java`, and `ATriangView.fxml`. The `ATriangView.fxml` file is open in the Scene Builder editor.

The Scene Builder preview window displays a user interface with:

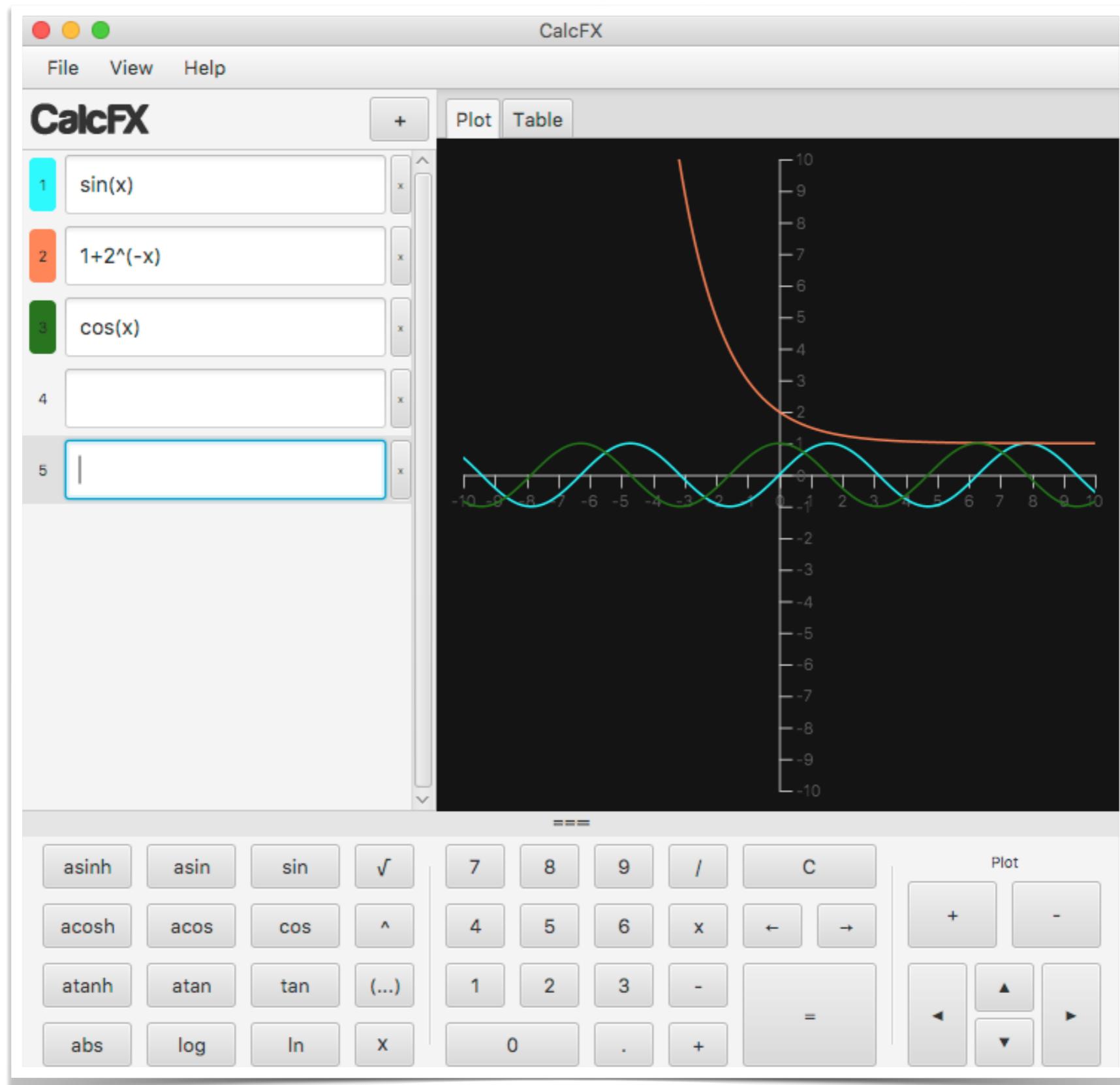
- A portrait of Heron of Alexandria.
- A triangle with sides labeled `a = ?` (36 cm), `b = ?` (48 cm), and `c = ?` (60 cm).
- Text fields for inputting values for `a`, `b`, and `c`.
- A text area showing the calculation of semi-perimeter s and area A using Heron's formula.
- A button labeled "Calcular".
- A label for the calculated area: `Area: 0.00000`.

The Properties panel on the right shows settings for the "Calcular" button, including text ("Calcular"), font ("System 13px"), and color ("BLACK").

IntelliJ IDEA



Trabalho Criativo





Trabalho Criativo

Sudoku Game Interface

9			8	2				6	
						4			
6			5		9	7			
		3			6	1	2		
			6	7				4	
		8	9						
7									
4	2			6	7	5		1	

Choose how many numbers you start:

Easy Medium Hard

New Game!



Trabalho Criativo

The screenshot shows a web browser window with the URL <http://www.ubi.pt/>. The page features a dark header with the UBI logo and navigation links for Universidade, Candidatos, Estudantes, Professores, Funcionários, Sociedade, and Alumni. Below the header is a large banner with the text "acesso 2018/19" and "licenciaturas e mestrados integrados". A row of circular icons representing various university services follows the text. The main content area is currently empty.

Notícias [ver todas](#)



Ontem

UBI abre 305 vagas para a 2.ª Fase do Concurso Nacional de Acesso



Ontem

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SET
21

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