Universidade de Aveiro
Departamento de Electrónica,
Telecomunicações e Informática

The Changes I Have Made to Visualization Courses Over the Last 10 Years

Beatriz Sousa Santos

Universidade de Aveiro, Portugal

bss@ua.pt

Eurographics 2012, Cagliari, May 17, 2012

What I used to teach in 2000

- Introduction: definitions, history, goals, principles and reference model
- Overview of visualization applications
- Human Visual System
- Visual Representation of Quantitative Information
- Data characteristics
- Visualization techniques
- Foundations on the enabling technologies: Computer Graphics, Digital Image processing and Human-Computer Interaction
- Visualization software

- Practical assignemnts: IDL

Beatriz Sousa Santos, "An introductory course on Visualization", Computers & *Graphics*, 24 (2000) 163-169

Learning outcomes

After the course students should:

- Understand the field including key concepts, techniques (opportunities and challenges)

- Be able to:
  – critique visualization designs and suggest how to improve them

  – design (and implement) effective visualization solutions to specific problems and data

  – know commercial systems (and APIs) available in this area and to choose one for a specific task or problem

---

What I have introduced meanwhile

- Contents:
  – more human characteristics (not only HVS)
  – distributed and collaborative Vis
  – displays

- Teaching methods:
  – more paper reading
  – more evaluation experiments
  – practical assignments using VTK

Paulo Dias, Joaquim Madeira, Beatriz Sousa Santos, "Teaching 3D Modeling and Visualization using the Visualization Toolkit", Computers & Graphics, 32 (2008) 363-370

Main difficulties

- What sequence?
- Depth versus breadth
- Different lengths (from 9h to 45h)
- Different audiences (PhD, MSc; CS, ECE, IS, MIS)

- Bibliography

- Interesting assignments
- APIs and Vis tools
- Data

- Students with different commitment levels

Information Visualization

- Introduction: definitions, history, goals, principles and reference model
- Overview of applications
- Perception and cognition
- Visual Representation of Quantitative Information
- Data characteristics
- Representation: encoding value and relation
- Presentation
- Displays
- Practical assignements: VTK, Prefuse

What next?

- What I will introduce more on:

  – evaluation
  – interaction
  – displays

Other Course Bibliography - 2012

- Ware, C., Information Visualization, Perception to Design, 2nd ed.,Morgan Kaufmann, 2004

- Spence, R., Information Visualization, Design for Interaction, 2nd ed., Prentice Hall, 2007

- Mazza, R., Introduction to Information Visualization, Springer, 2009

- Bederson, B. , B. Shneiderman, *The Craft of Information Visualization: Readings and Reflections*, Morgan Kaufmann, 2003

- Friendly, M., *Milestones in the history of thematic cartography, statistical graphics, and data visualization*, 2008

- Thomas, J., K. Cook*, Illuminating the Path: The Research and Development Agenda for Visual Analytics,* 2005