The structural nature of the Web

III EC3 Seminary, University of Granada, 16-17th march







Agenda

- Web is a network
 - Scale-free networks
 - Directed networks
- Web is content
 - 15 EU academic web space
 - Is the web fractal?
 - Outlinks maps
 - Inlinks maps
 - World-class universities on the Web
 - Latinoamerican university web domain
- Web is moving
 - How does the Web change?
 - How old is the Web?

Web is a network

World Wide Web: a networked environment

The importance of the links

- Visibility
- Popularity
- Traffic
- Relating contents

Research questions

- What is the shape of the Web?
- What is the importance of that shape?

Scale-free networks

They are free of scale, no parametric

Winners take all!

• Preferential attachment

Small-world networks

- Short average path length
- High clustering coefficient

Directed networks





Broder et al. (2000)

Björneborn (2001)

What is the role of the webometrics?

What about the contents?

- Thematic, cultural, linguistic relationships
- Volume of information

How do the links relate these contents

- Links as transfer of contents
- Links as web assessment

How does this structure evolve?

• Persistence of links and contents

EU 15 academic web space



Is the Web fractal?



- The size (in number of pages) affects to the proportion in-outlinks
- This effect is more notable in outlinks than inlinks
- The inlinks and outlink ratio increases/decreases as the size of the sub-network decreases/increases

Outlinks maps



Inlinks maps





Processing & Management, 45: 272-279





How does the Web change?

	% Added %	6 Changed	% Missed
Pages	1521.32	17.09	80.67
Images	2160.77	11.17	80.34
Gateways	566.15	4.32	65.08
Media	2678.75	7.56	65.49
Internet	901.89	10.62	77.72
Total	1568.10	13.81	82.04

Ortega, J. L., Aguillo, I., Prieto, J. A. (2006). Longitudinal Study of Contents and Elements in the Scientific Web environment. *Journal of Information Science*, 32 (4): 344-351

How old is the Web?



Ortega, J. L., Cothey, V., Aguillo, I. F. (2009). How old is the Web? Characterizing the age and the currency of the European scientific Web. Scientometrics, 81(1):295-309

Lessons

Content is a key factor to configurate the web network

• The more contents, the more inlinks

The Web is set up by local sub-network

• Thematic, cultural, linguistic and geographical criteria

The Web changes quickly and without a pattern

• Web grows feeding off the Web

Muchas gracias!