

230322 - STSN - Statistical Tools for Social Networks and the Www

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
 Teaching unit: 739 - TSC - Department of Signal Theory and Communications
 Academic year: 2019
 Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)
 BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Optional)
 BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
 BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
 BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
 BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Optional)
 ECTS credits: 2 Teaching languages: English

Teaching staff

Coordinator: Enric Monte Moreno
 Others: Enric Monte Moreno

Prior skills

Having passed the semester 2b

Requirements

Knowledge of linear algebra and probability

Teaching methodology

blackboard classes and individual work

Learning objectives of the subject

The aim of this course is to train students in understanding the techniques and tools for describing social networks and www. The course will teach techniques for ranking (ex. google?s pagerank for web pages), recommender systems (ex. amazon?s recommendations of similar products), Auctions of advertisements (i.e. googles adwords), Finding influencers in social networks, finding communities in social networks, finding text similarity between documents by meaning (i.e. similarity between posts in blogs).

Study load

Total learning time: 50h	Hours large group:	20h	40.00%
	Self study:	30h	60.00%

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Content

<p>Ranking Systems.</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Description algorithms for sorting websites by relevance. Algorithms for graphs made of links between pages: Pagerank and HITS.</p> <p>Related activities: Individual Deliverable</p> <p>Specific objectives: Understanding google's Pagerank and HITS equations from different points of view; flow graph, random walk, probability of visiting a node.</p>	
<p>Recommender systems</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Description of the recommender systems based on Collaborative and content based. Description of different recommender systems; amazon, netflix, facebook.</p> <p>Related activities: Individual Deliverable</p> <p>Specific objectives: Be able to adapt the general methods of recommender systems to specific situations.</p>	
<p>Auctions of web advertisements</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Description of systems for making auctions of online advertisements. Summary of the modified Vickrey auction system used by google's adwords.</p> <p>Related activities: Individual Deliverable</p>	

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<p>Social Networks as graphs</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Techniques for finding influencers and communities in graphs. Specific properties of twitter type graphs and facebook type graphs.</p> <p>Related activities: Individual Deliverable</p>	
<p>Finding text similarity between documents by meaning</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Bag of words model for texts, stemming and word-term matrix. Latent semantic analysis</p> <p>Related activities: Individual Deliverable</p>	

Qualification system

Individual assessments: 40%
Final examination: 60%

Bibliography

Basic:

- Easley, D.; Kleinberg, J. Networks, crowds, and markets: reasoning about a highly connected world. New York: Cambridge University Press, 2010. ISBN 9780521195331.
- Langville, A.N.; Meyer, C.D. Google's pagerank and beyond: the science of search engine rankings. Princeton, NJ: Princeton University Press, 2006. ISBN 9780691122021.