LEARNING OBJECTIVES OF THE SUBJECT

The economics of Internet is crucial since technology and economy interactions are bidirectional. This field is challenging to study because of the lack of publicly available data on ISP's cost structures and the difficulty of collecting well-calibrated consumer data. In this sense, this course studies how companies obtain the appropriate returns that guarantee its economic feasibility. The returns are obtained from ISPs' users that choose among the offered services and the used pricing model. Undoubtedly the formation and growth of Internet is driven in part by economic considerations that have allowed a fast growing of services that lies on its infrastructure. There are many examples of successful services that today form an important part of our society and our life. All of them have contribute to develop what people name network economy. Thus, this course describes the underlying analytic characteristics that support them. This evaluation allows us to know the basic technical concepts that support them. In this course the analysis of scalability of P2P systems such as Skype and Bit Torrent is studied as well as the basic tools used from Netflix, Amazon or Wikipedia in the aim to adopt their decisions. Other examples of interest include some basic features of Google such as: the Page Rank algorithm and the used auction mechanism for ads. All of these services are successful examples of interactions between economy and technology.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>39,0</td>
<td>31.20</td>
</tr>
<tr>
<td>Self study</td>
<td>86,0</td>
<td>68.80</td>
</tr>
</tbody>
</table>

Total learning time: 125 h
CONTENTS

1. Pricing services

Description:
1.1. Charging services
1.2. Smart data pricing
1.3. Economic models of pricing services

Full-or-part-time: 22h 26m
Theory classes: 7h
Self study: 15h 26m

2. Google services

Description:
2.1. Search service. Page Rank
2.2. Advertisement service. Google adds

Full-or-part-time: 25h 38m
Theory classes: 8h
Self study: 17h 38m

3. Smart heuristics in P2P scalability

Description:
3.1. The Bit Torrent case
3.2. The Skype case

Full-or-part-time: 19h 14m
Theory classes: 6h
Self study: 13h 14m

4. Recommendation by collaborative filtering: Netflix

Description:
4.1. Predictors (least squares problem, temporal models, convex optimization)
4.2. Neighborhood model (similarity, weighted prediction)
4.3. Latent-factor model (matrix factorization, alternating projection)

Full-or-part-time: 19h 14m
Theory classes: 6h
Self study: 13h 14m
5. Bayesian Ranking: Amazon

Description:
5.1. Bayesian estimation
5.2. Bayesian ranking
5.3. Amazon ranking
5.4. Reviewing reviews (Adaptive boosting: Ada Boost)

Full-or-part-time: 19h 14m
Theory classes: 6h
Self study: 13h 14m


Description:
6.1. Voting Models
6.1.1. Plurality model and Kemeny rule
6.1.2. Positional voting (Borda count)
6.1.3. Condorcet voting
6.2. Arrow's impossibility result
6.3. Sen's impossibility result (the prisoner's dilemma)

Full-or-part-time: 19h 14m
Theory classes: 6h
Self study: 13h 14m

GRADING SYSTEM

First Part (Lessons 1, 2 and 3): Exam 30%, Continuous Assessments 20%
Second Part (Lessons 4, 5 and 6): Exam 30%, Continuous Assessments 20%