Lecture title: *Economic aspects of p2p systems*

Abstract

Users who join a peer-to-peer network have, in general, incorrect incentives to contribute to the network, because of the externalities that exist between them. The result is an inefficient network: the overall levels of contribution are less than would be the case if each peer acted in the interests of the entire network. The asymptotic analysis of certain public good models for p2p systems suggests that when the aim is to maximize social welfare a fixed contribution scheme in terms of the number of files shared can be asymptotically optimal as the number of participants n grows to infinity. Such a simple scheme eliminates free riding, is incentive compatible and obtains a value of social welfare that is within $o(n)$ of that obtained by the second-best policy of the corresponding mechanism design formulation of the problem. This lecture will provide an introduction on p2p economics using public good models. It will analyse the case of fixed contribution policies for the efficient allocation of resources in p2p networks and show some interesting extensions.

1st Lecture: *Introduction to p2p economics and public good theory*

- free rding
- externalities
- inefficiency of free markets
- existing work
- public good formulation of the p2p resource allocation problem
- introduction to economics of public goods/mechanism design
- short description of our results (introduction to next lecture)

2nd Lecture: *An asymptotically optimal scheme for p2p file sharing*

- a public good model for p2p
- simple contribution policies with exclusions
- an application to file sharing
    - heterogeneous file popularity
    - stability
    - group formation
    - adaptation
    - practical aspects
- future directions

Prof. Costas Courcoubetis
Dept of Computer Science
Athens University of Economics and Business
Patision 76, Athens 10434 , Greece
+302108203653 (office)
+306944357951 (mobile)
www.aueb.gr/users/courcou/