



Programa de doctorat de Matemàtica Aplicada
Facultat de Matemàtiques i Estadística
Universitat Politècnica de Catalunya
Barcelona, Spain



Advanced Course
Polymatroids etcetera:
Algorithms and Pretty Theorems
by Jack Edmonds

January 11-21, 2010

Course Description

A variety of combinatorial existence theorems will be proved by algorithms which tell how to find an instance of what is asserted to exist. Another main purpose will be to introduce polyhedral combinatorics, which uses systems of linear equations to obtain algorithms and theorems. Emphasis will be on matroids and polymatroids with a variety of applications, especially to tree systems and branching systems in networks.

Some quotes from the book 'Combinatorial Optimization', by Lex Schrijver

"Pioneered by the work of Jack Edmonds, polyhedral combinatorics has proved to be a most powerful, coherent and unifying tool throughout combinatorial optimization. Not only has it led to efficient (that is, polynomial-time) algorithms, but also, conversely, efficient algorithms often imply polyhedral characterizations and related min-max relations. It makes the two sides closely intertwined."

"In the 1960's Edmonds advocated calling an algorithm efficient [or "good"] if its running time is bounded by a polynomial in the size of its representation. Since then, this criterion has won broad acceptance, also because Edmonds found polynomial-time algorithms for several important optimization problems"

"Edmonds conjectured that there is no polynomial-time algorithm for the traveling salesman problem. In language that was developed later, this is equivalent to $NP \neq P$."

Registration

Please send an e-mail tagged '**Edmonds2010Course**' to info-osrm@upc.edu indicating your situation and e-mail address.

There is no registration fee. Further information at

<https://www-ma4.upc.edu/~oserra/seminari/jackedmonds2010.html>

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