

ATENEEO



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Location theory and some basic physical and social principles in a nutshell

Abstract: Location Theory is an appealing field of Operations Research that shares many links with optimization. The most important problems in this area can be formulated as mathematical programming problems in different framework spaces: continuous, networks or discrete. Lots of insights are gained on the original problems analyzing their mathematical programs counterparts and reciprocally, many results can be inherited from the structure of the original problems; what helps in solving the models. This presentation would like to focus on a different aspect that is not so well-known: the relationship between basic principles in Physics and Economics and fundamental models and solution methods applied in location problems.

We will revisit some well-known laws as the equilibrium of forces, symmetry in social sciences, maximum entropy, law of Snell, law of gravity or the optimal mass transport theory. The goal will be to link them to some problems in the field of Location analysis.

In this talk, we show how the equilibrium of forces can be used to derive algorithms to solve continuous (single and multiple) facility location, symmetry is the basis of the ordered median problem, maximum entropy can explain obnoxious facility location models, the law of Gravity can be used to determine market shared areas or to define territorial units, the Snell's law is applicable to modeling different transport modes in location or transportation problems or how the optimal mass transport theory can be used to compute optimal territory design. We will explain the connections, interpret the results in the jargon of location analysis and show some applications.

Sala de Grados I, Facultad de Ciencias
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