

A Brouwer-Tarski Fixed-Point Theorem

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Abstract : We provide n-dimensional fixed-point theorems for possibly discontinuous functions which extend Brouwer's fixed-point theorem and encompass interesting cases of Tarski's fixed-point theorem. The main idea is to require that at any discontinuity point where the graph of the function "crosses the diagonal", the function satisfies a specific assumption (similar to upward jumps). For this purpose, we classify some types of discontinuities, and use them to prove our new fixed-point theorems, with some applications in game theory.

Keywords : fixed-point, Brouwer's fixed-point theorem, Tarski's fixed-point theorem, discontinuity, Nash equilibrium, supermodular game

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