Kakutani S Fixed Point Theorem And The Minimax Theorem In

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A FURTHER GENERALIZATION OF THE KAKUTANI FIXED POINT ...

Kakutani, Shizuo. A generalization of Brouwer ’ s fixed point theorem. Duke Math. J. 8 (1941), no. 3, 457--459. doi:10.1215/S0012-7094-41-00838-4. https://projecteuclid.org/euclid.dmj/1077492791. Export citation.

Markov – Kakutani fixed-point theorem - Wikipedia

KAKUTANI ’ S FIXED POINT THEOREM Theorem: Let $X \subset Rn$ be closed, bounded, and convex. For every $x \in X$ let $F(x)$ be a non-empty, convex subset of X. Assume that the graph of the set-valued functions is closed in $X \times X$. Then there exists a point $x? \in X$ such that x?∈ F(x).

Kakutani : A generalization of Brouwer ’ s fixed point theorem

KAKUTANI FIXED POINT THEOREM 121 Using Theorem 2, we now prove an interesting fact, which can be com- pared with Fan's fixed point theorem [3]. THEOREM 3. Let C he a nonempty closed convex subset in a Hausdorff topological vector space E and F: C 2e he a map such that (1) F{x) is closed for each xe C. (2) F '(v) is convex for each yeC.

Kakutani's Fixed Point Theorem -- from Wolfram MathWorld

Shizuo Kakutani's Fixed Point Theorem. Shizuo Kakutani discovered and proved in 1941 a generalization of Brouwer's Fixed Point Theorem. Brouwer's theorem applies to continuous point-to-point functions. Kakutani dealt with set-valued function; i.e., point-to-set functions.

Some applications of the Kakutani fixed point theorem ...

Abstract : Kakutani's Fixed Point Theorem states that in Euclidean n-space a closed point to (non-void) convex set map of a convex compact set into itself has a fixed point. Kakutani showed that this implied the minimax theorem for finite games. The object of this note is to point out that Kakutani's theorem may be extended to convex linear topological spaces, and implies the minimax theorem ...

Shizuo Kakutani's Fixed Point Theorem

In mathematical analysis, the Kakutani fixed-point theorem is a fixed-point theorem for set-valued functions. It provides sufficient conditions for a set-valued function defined on a convex , compact subset of a Euclidean space to have a fixed point , i.e. a point which is mapped to a set containing it.

Kakutani S Fixed Point Theorem

Kakutani's fixed-point theorem is used in proving the existence of cake allocations that are both envy-free and Pareto efficient. This result is known as Weller's theorem. Proof outline S = [0,1] The proof of Kakutani's theorem is simplest for set-valued functions defined over closed intervals of the real line.

Kakutani fixed-point theorem - Infogalactic: the planetary ...

Kakutani's fixed point theorem is classically equivalent to Brouwer's fixed point theorem. The constructive proof of (an approximate) Brouwer's fixed point theorem relies on a finite combinatorial argument; consequently we must restrict our attention to uniformly continuous functions. Since Brouwer's fixed point theorem is a special case of ...

KAKUTANI'S FIXED POINT THEOREM AND THE MINIMAX THEOREM IN ...

Kakutani's fixed point theorem [3]1 states that in Euclidean « -space a closed point to (nonvoid) convex set map of a convex compact set into itself has a fixed point. Kakutani showed that this implied the minimax theorem for finite games. The object of this note is to point out that Kakutani's theorem may be extended

Kakutani's Fixed Point Theorem | Alexander Adam Azzam

The Kakutani fixed-point theorem is a generalization of Brouwer's fixed-point theorem, holding for generalized correspondences instead of functions. Its most important uses are in proving the existence of Nash equilibria in game theory, and the Arrow – Debreu – McKenzie model of general equilibrium theory.

HET: Fixed-Point Theorems

KAKUTANI'S FIXED POINT THEOREM AND THE MINIMAX THEOREM IN GAME THEORY5 since x! ' n(x) is a continuous point-to-point mapping of an r-dimensional closed simplex into itself, there exists a point x n 2Ssuch that x n = ' n(x) by Brouwer's xed point theorem (Theorem 1.6).

Kakutani fixed-point theorem - Wikipedia

In mathematics, the Markov – Kakutani fixed-point theorem, named after Andrey Markov and Shizuo Kakutani, states that a commuting family of continuous affine self-mappings of a compact convex subset in a locally convex topological vector space has a common fixed point.

Kakutanis Fixed Point Theorem Theorem 3 Thm 34 Kakutanis ...

The theorem then states that $ f $ has a fixed point (i.e., there is a point $ x \in X $ such that $ x \in f (x) $). S. Kakutani showed in [1] that from his theorem, the minimax principle for finite games does follow.

Kakutani theorem - Encyclopedia of Mathematics

(C) Kakutani ’ s Fixed Point Theorem The following, Kakutani's fixed-point theorem for correspondences (Th. 1.10.2 in Debreu, 1959), can be derived from Brouwer's Fixed Point Theorem via a continuous selection argument.. Theorem: (Kakutani) Let j: S ® S be an upper semi-continuous correspondence from a non-empty, compact, convex set S Ì R n into itself such that for all x Î S, the set j (x ...

[1611.02531] Kakutani's fixed point theorem in ...

Kakutani's Fixed Point Theorem is a powerful generalization of Brouwer's Fixed Point Theorem. It has several deep and important corollaries in economics, which include: the Arrow-Debreu theorem, which proves the existence of a general equilibrium of an economy under certain assumptions. That is, there exists a set of prices such that aggregate supplies will equal aggregate demands⋯

[PDF] A FURTHER GENERALIZATION OF THE KAKUTANI FIXED POINT ...

The Kakutani fixed point theorem can be used to prove the minimax theorem in the theory of zero-sum games.This application was specifically discussed by Kakutani's original paper. [1] Mathematician

John Nash used the Kakutani fixed point theorem to prove a major result in game theory. [2] Stated informally, the theorem implies the existence of a Nash equilibrium in every finite game with mixed ...

Kakutani fixed-point theorem - WikiMili, The Best ...

Kakutani's fixed-point theorem is quite similar to Brouwer's fixed point theorem - the main difference is that Brouwer speaks about single-valued functions and Brouwer about multi-valued functions. There is a way to go from multi-valued functions to single-valued ones - it is Michael's selection theorem.

Shizuo Kakutani - Wikipedia

Kakutani ’ s Fixed Point Theorem Theorem 3. (Thm. 3.4 ’ . Kakutani ’ s Fixed Point Theorem) Let $X \subseteq R$ n be a non-empty, compact, convex set and $\Psi : X \rightarrow 2$ X be an upper hemi-continuous correspondence with non-empty, convex, compact values. Then Ψ has a fixed point in X. Proof. (sketch) Here, the idea is to use Brouwer ’ s theorem after ...

KAKUTANI ’ S FIXED POINT THEOREM

Kakutani's fixed point theorem is a result in functional analysis which establishes the existence of a common fixed point among a collection of maps defined on certain "well-behaved" subsets of locally convex topological vector spaces. The theorem is relevant both because of its independent theoretical significance and because of other results which stem as corollaries therefrom.