Algorithmic models of market equilibrium

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We suggest a new framework for constructing mathematical models of market activity. Contrary to the majority of the classical economical models, we get a characterization of general equilibrium of the market as a saddle point in a convex-concave game. This feature significantly simplifies the proof of existence theorems and construction of the adjustment processes both for producers and consumers.

Moreover, we argue that the unique equilibrium prices can be characterized as a unique limiting point of some simple price dynamics. In our model, the equilibrium prices have natural explanation: they minimize the total excessive revenue of the market's participants. Due to convexity, all our adjustment processes have unambiguous behavioral and algorithmic interpretation.

In collaboration with Yurii Nesterov.