

Electrical Flows, Continuous Optimization, and the Maximum Flow Problem

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In this talk, I will describe how combining the electrical flow computations with certain continuous optimization primitives provides us with a powerful new set of tools for graph algorithms. I will illustrate applicability of these ideas by employing them to the maximum flow problem - a task of key importance in optimization and operations research.

The obtained algorithms improve over the celebrated results of Even-Tarjan and Hopcroft-Karp as well as bring a new perspective on interior-point methods - a fundamental tool in convex optimization.