

## Chopping things up to decide stuff fast

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Structural graph theorists and algorithmicists alike know that it's usually a smart idea to decompose graphs into smaller and simpler parts before trying answer difficult questions. Tree decompositions are one of the best-known ways of chopping graphs up and they have been key tools for establishing deep results in many areas of discrete mathematics including graph minor theory and algorithmic meta-theorems.

*But what happens if we want to compute on other kinds of mathematical structures?*

In this talk I will explain how to use the recent, category-theoretic notion of a *structured decomposition* (a way of decomposing arbitrary mathematical objects, not just graphs) to solve any decision problem that is encoded as a *sheaf* in *fixed-parameter tractable time*. This work is part of a large interdisciplinary project which so far has required a blend of structural graph theory, parameterized complexity, category theory and sheaf theory. As such you should consider it an invitation to get involved!

Keywords: tree decompositions, parameterized algorithms, sheaves, algorithmic metatheorems