

**Pavol Hell**

LIST HOMOMORPHISMS

List homomorphisms are a common generalization of homomorphisms and list colourings. The existence of homomorphisms to a fixed digraph is a difficult problem, at the core of the dichotomy conjecture of constraint satisfaction. The existence of list homomorphisms (and list constraint satisfaction problems) is much better behaved, and its dichotomy is known. For undirected graphs  $H$ , the list homomorphisms to  $H$  can be solved in polynomial time precisely for graphs with nice structure, say interval graphs in the reflexive case. For list constraint satisfaction problems, there is an algebraic classification based on the notion of polymorphism. I will survey the background and describe a new combinatorial classification of the complexity of list homomorphisms to digraphs, akin to those for undirected graphs.

This is joint work with Arash Rafiey.