

Superposition of snarks revisited

Martin Škoviera

(joint work with Edita Máčajová)

Superposition is generally regarded as one of the most powerful techniques for constructing snarks (cubic graphs admitting no proper 3-edge-colouring). Roughly speaking, superposition replaces the vertices and edges of a base snark G with certain graphs – supervertices and superedges – and puts them together in such a way that the resulting graph \tilde{G} is cubic and keeps the “shape” of G . The heart of the method is, however, the argument that after a suitable choice of supervertices and superedges \tilde{G} is again a snark. A typical reasoning concludes that if \tilde{G} was 3-edge-colourable, then so would be G . In this talk we introduce an entirely new kind of superposition wherein \tilde{G} is guaranteed to be a snark if and only if two graphs derived from G in a certain way are both snarks. We also mention an application of this method to constructing permutation snarks.