THE SURFACE TUTTE POLYNOMIAL OF AN EMBEDDED GRAPH

IN COLLABORATION WITH THOMAS KRAJEWSKI, BART LITJENS, GUUS REGTS, LLUÍS VENA

ANDREW GOODALL

Abstract. A defining property of the Tutte polynomial of a graph is that it gives as an evaluation both the number of nowhere-zero tensions (corresponding to proper vertex colourings) and the number of nowhere-zero flows using non-zero elements of a finite additive Abelian group: Indeed, the Tutte polynomial can be regarded as the "least common generalization" of the chromatic polynomial and flow polynomial.

The surface Tutte polynomial of a cellularly embedded graph, defined recently by the authors, gives as an evaluation both the number of nowhere-identity local tensions and the number of nowhere-identity flows (using non-identity elements of a finite, not necessarily Abelian group). The surface Tutte polynomial is more formally akin to Tutte's universal V-function than the Tutte polynomial, but includes as a specialization familar invariants of embedded graphs such as the Kruskal polynomial and Bollobás–Riordan polynomial as well as the Tutte polynomial itself.

In this talk a brief overview will be given of the little I know about the surface Tutte polynomial, followed by some possible directions for future inquiry.

Computer Science Institute, Charles University, Prague
Email address: andrew@iuuk.mff.cuni.cz
URL: https://iuuk.mff.cuni.cz/~andrew/