Introduction to Graph Algebras and Attempts at their Classification

Lia Vas

University of the Sciences – Philadelphia USA

After a review of some necessary background in algebra, we introduce classes of algebras related to a directed graph and present a hands-on method of computing their (pointed) K_0-groups. We put most of our focus on Leavitt path algebras, but the methods we present can also be used for other graph algebras.

The examples we present illustrate that the K_0 group does not classify Leavitt path algebras. However, if one considers the grading of these algebras and adjusts the definition of the K_0-group to reflect the existence of this grading, the situation becomes more interesting. The Graded Classification Conjecture states that this adjusted version of the (pointed) K_0-group is a complete invariant of Leavitt path algebras over a field. After presenting some examples illustrating the conjecture, we discuss the context in which this conjecture has been formulated, its current status, its relations with other conjectures, and some ongoing research.