Computable reducibility and its variants

Luca San Mauro

Vienna University of Technology, Austria

Abstract. Computability reducibility is the effectivization of Borel reducibility, one of the main focuses of modern descriptive set theory. It has been studied for decades – being firstly introduced by Ershov in the 1970s – and was successfully applied to measure the complexity of many equivalence relations arising in mathematics. To give few examples, computable reducibility has been used to compare: the complexity of isomorphism relations of familiar classes of structures; the word problems of finitely generated and finitely presented groups; the provability within different fragments of PA.

In this talk, we will survey all these applications and many others. We will also discuss the current knowledge about the degree structure generated by computable reducibility. Finally, we will report on recent progress about reducibilities between equivalence relations that are natural variants of the computable one.