

SEMINÁRIO DE TEORIA DA COMPUTAÇÃO

Functional Tuple Pairs and Applications to Higher-Order Complexity Theory

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Abstract. In this talk we discuss early developments of functional tuple pairs, i.e., an interpretation method for higher-order rewriting and functional programming. The main goal of this technique is thought to be twofold: first, we show how tuple interpretation subsumes earlier interpretation techniques and might be used in combination of classic methods like dependency pairs and rule removal; this is already the case in first-order rewriting. Second, we use tuple interpretations as a way to express runtime complexity for higher-order algebraic systems discussing a proper higher-order notion of program-data. We show that under mild assumptions we can derive complexity bounds for closed higher-order programs. We also show preliminary results on those interpretations being used as a main technique in implicit complexity theory as we might be able to capture higher-order functional complexity classes, for instance, the class of Basic Feasible Functionals (BFFs).