

# Unranked Quantifier Theory

*Khimur Rukhaia and Lali Tiuba*

E-mail.: [khimuri.rukhaia@tsu.ge](mailto:khimuri.rukhaia@tsu.ge); [lali.tibua@tsu.ge](mailto:lali.tibua@tsu.ge)

Department of Mathematics, Faculty of Exact and Natural Sciences, Tbilisi State University

University str. 2, 0186 Tbilisi, Georgia

Languages, where function and predicate symbols do not have fixed arity are subject of intensive investigation because of their usefulness in many areas. As usual, in unranked languages we have two kind of variables: subject variables, which can be substituted by terms and sequence variables (we call them “subject sequence variables” below), which can be substituted by finite sequences of terms. In contrast to the languages described above, our unranked quantifier theory contains two kinds of variables: a) subject sequence variables, which can be substituted by finite sequences of terms and b) propositional sequence variables, which can be substituted by finite sequences of formulas. Apart this, our theory “tau” contains existential and universal quantifiers, which have no fixed arity – they are unranked operators. These operators are defined according to Shalva Pkhakadze’s derivative operators under the rational rule frame. Based on that, we proved analogous results in our theory as N. burbaki had in his quantifier theory.