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Min Shu* (min.shu@uconn.edu), 1 University Pl, Stamford, CT 06901, and **Wei Zhu** (wei.zhu@stonybrook.edu). *Extension of Rough Set Based on Positive Transitive Relation.*

Rough set-based data analysis methods have found great successes in data science and artificial intelligence. The application of rough set theory in incomplete information systems is a key problem in practice since missing values almost always occur in knowledge acquisition due to the error of data measuring, the limitation of data collection, or the limitation of data comprehension, etc. The existing rough set extension models based on tolerance or symmetric similarity relations typically discard one relation among the reflexive, symmetric and transitive relations, especially the transitive relation. In order to overcome the limitations of the current rough set extension models, we define a new relation called the positive transitive relation and then propose a novel rough set extension model built upon which. In comparison to the existing extension models, the proposed model has a better performance in processing the incomplete information systems while substantially reducing the computational complexity, taking into account the relation of tolerance and similarity of positive transitivity, and supplementing the related theories in accordance to the intuitive classification of incomplete information. (Received September 17, 2019)