Covering-based Granular Computing

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***Abstract*—In this lecture, binary granular computing (granular computing on binary relations) is re-examined. Two definitions for approximations in Rough Set Theory (one is from equivalence relation and the other from point-based topology view) were no longer equal under binary relation, the latter will have the better performance, especially when the universe is infinite. However, the point-based definition is lacking of AI explanation, thus central knowledge was then defined and introduced to perfect the topology definition. It can be proven that the two equivalent approximations in Rough Set Theory are both the special cases for topology-based central-knowledge approximations, and they are united by central knowledge.**

Furthermore, binary knowledge base (B-KB), binary knowledge dependency (B-KD), binary association rules and binary knowledge representation system will also be discussed. More details will be explained by definitions, theorems, proofs and examples.

Binary Granular Computing has many close relation with other generalized Rough Set model, some comparisons will also be given.