NEW CLASS OF LEBESGUE QUADRATIC STOCHASTIC OPERATORS ON CONTINUAL STATE SPACE

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ABSTRACT

The theory of quadratic stochastic operator (qso) has been developed significantly since it was introduced in the early of 20th century by Bernstein through his work on population genetics. In this research, we introduce a new construction of Lebesgue qso generated by 2measurable partition on the continual state space . The main aim of this research is to investigate the trajectory behaviour of such operators by reducing its variables into one-dimensional setting which correspond to the number of its measurable partition. The limit behaviour of such operators will be investigated computationally and analytically where the computational results conform to the analytical results. Measure and probability theory alongside the functional analysis will be employed to investigate the limit behaviour and characteristics of fixed points. The results showed that for measure of Lebesgue qso less than two parameters, one can find the behaviour of such operators either have fixed point or periodic point of period 2. These results suggest that the new Lebesgue qso generated by 2measurable partition can be regular or nonregular transformation depends on the given conditions.

Keywords: Quadratic Stochastic Operator, Measurable Partition, Periodic Point, Regularity, Limit Behaviour

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