Dynamical Sampling for Unmanned Multirotor Aerial Vehicles

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We study positive generators and positive bases of a finite-dimensional real inner product space V. These sets allow the generation of V through linear combinations with non-negative coefficients. Following classical ideas from Davis [1], a new approach is proposed based on dynamic sampling results [2], using the iteration of a linear operator A on a set of vectors. The goal is to characterize necessary and sufficient conditions for the set generated by such iterations to be a positive generator or a positive basis. Instead of a geometric analysis, the focus is on the eigenspaces and eigenvalues of A, supported by recent results on polynomials with non-negative coefficients [3]. In the case of R^3, necessary and sufficient conditions are obtained, which are relevant for applications such as positive control of aerial vehicles [4, 5].

References

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MCA 2025 internal code: SS01-T21

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In Special Session 1 on Applied Harmonic Analysis and Operator Theory at the Mathematical Congress of the Americas 2025.