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ABSTRACTS OF TALKS

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Adapted Decimation on Finite Frames for Arbitrary Orders of Sigma-Delta Quantization

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In Analog-to-digital (A/D) conversion, signal decimation has been proven to greatly improve the efficiency of data storage while maintaining high accuracy. When one couples signal decimation with the $\Sigma\Delta$ quantization scheme, the reconstruction error decays exponentially with respect to the bit-rate. We build on our previous result, which extended signal decimation to finite frames, albeit only up to the second order. In this study, we introduce a new scheme called adapted decimation, which yields polynomial reconstruction error decay rate of arbitrary order with respect to the oversampling ratio, and exponential with respect to the bit-rate.

Inequalities Involving Complex Polynomials

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Let $p(z) = \sum_{j=0}^{n} a_j z^j$ be a polynomial of degree n. Further, let $M(p,R) = \max_{|z|=R\geq 1} |p(z)|$, and $\|p\| = M(p,1)$. Then according to the well-known Bernstein inequalities, we have $\|p'\| \leq n\|p\|$ and $M(p,R) \leq R^n\|p\|$. It is an open problem to obtain inequalities analogous to these inequalities for the class of polynomials satisfying $p(z) \equiv z^n p(1/z)$. In this paper we obtain some inequalites in this direction for polynomials that belong to this class and have all their coefficients in any sector of opening γ, where $0 \leq \gamma < \pi$. Our results generalize and sharpen several of the known results in this direction. We also present two examples to show that in some cases the bounds obtained by our results can be considerably sharper than the known bounds.