

Recent Papers Dealing with Turán's Problems

This list, supplied by G. G. Lorentz, P. G. Nevai, V. Sós and J. Szabados, contains papers which either solve some of Turán's problems or are related to them.¹

Problem I

- C. DE BOOR AND A. PINKUS, Proof of the conjectures of Bernstein and Erdős concerning the optimal nodes for polynomial interpolation, *JAT* 24 (1978), 289–303.
T. A. KILGORE, Optimization of the norm of the Lagrange interpolation operator, *Bull. Amer. Math. Soc.* 83 (1977), 1069–1071.
T. A. KILGORE, A characterization of the Lagrange interpolating projection with minimal Tchebycheff norm, *JAT* 24 (1978), 273–288.
T. A. KILGORE AND E. W. CHENEY, A theorem on interpolation in Haar subspaces, *Aequationes Math.* 14 (1976), 391–400.

Problem II

- E. A. RACHMANOV, On Steklov's conjecture in the theory of orthogonal polynomials, *Mat. Sb.* 108 (150) (1979), 581–608.

Problem III

- P. ERDŐS AND P. VÉRTESI, On the almost everywhere divergence of Lagrange interpolatory polynomials for an arbitrary system of nodes, *AMASH*, in press.

Problem VI

- P. ERDŐS AND J. SZABADOS, On the integral of the Lebesgue function of interpolation, *AMASH* 32 (1978), 191–195.

Problem IX

- P. G. NEVAI, "Orthogonal Polynomials," *Memoirs of the Amer. Math. Soc.*, No. 213, Amer. Math. Soc., Providence, R.I., 1979. Corollary 10.18 solves Problem IX.

Problems X and XI

- P. G. NEVAI, Mean convergence of Lagrange interpolation, I, *JAT* 18 (1976), 363–377.
P. G. NEVAI, Mean convergence of Lagrange interpolation, II, *JAT*, in press.
P. VÉRTESI, Note on mean convergence of Lagrange parabolas, *JAT* 28 (1980), 30–35.

Problem XII

- V. F. VLASOV, Rough and fine theory in the convergence of interpolatory and quadrature processes, *Dokl. Akad. Nauk SSSR* 168 (1966), 735–736 (*Soviet Math. Dokl.* 7 (1966), 710–711). No proofs, no comments on it by Turán.

¹ Nonstandard abbreviations used: *AMASH*, *Acta Math. Acad. Sci. Hungar.*; *JAT*, *J. Approximation Theory*; *TAMS*, *Trans. Amer. Math. Soc.*

Problems XVIII and XXIV

P. VÉRTESI, Two problems of P. Turán, to appear.

Problems XIX and XX

P. VÉRTESI, Two problems of P. Turán, to appear in Turán's Memorial Volume.

P. VÉRTESI, On some problems of P. Turán, *AMASH* **29** (1977), 337–353.

Problems XXII and XXIII

P. VÉRTESI, Comparison of Lagrange and Hermite-Fejér interpolation, *AMASH* **28** (1976), 349–357.

P. VÉRTESI, Contribution to the theory of interpolation, *AMASH* **29** (1977), 165–176.

P. VÉRTESI, On Hermite-Fejér and Lagrange interpolatory processes, *Periodica Math. Hungar* **10** (1979).

Problem XXV

P. VÉRTESI, On the divergence of a certain Hermite-Fejér interpolation, *Periodica Math. Hungar.* **9** (1978), 249–254.

Problem XXVII

P. VÉRTESI, Hermite-Fejér type interpolations, I, *AMASH* **32** (1978), 349–369; II, **33** (1979), 333–343; III, **34** (1979), 67–84.

Problem XXX

A. S. CAVARETTA, JR., A. SHARMA, AND R. S. VARGA, Hermite-Birkhoff interpolation in the n -th roots of unity, *TAMS*, in press.

G. G. LORENTZ AND S. D. RIEMENSCHNEIDER, Recent progress in Birkhoff interpolation, in "Approximation Theory and Functional Analysis" (J. B. Prolla, Ed.), pp. 187–236. North-Holland, Amsterdam, 1979.

G. G. LORENTZ, Independent sets of knots and singularity of interpolation matrices, *JAT*, in press.

G. G. LORENTZ AND S. D. RIEMENSCHNEIDER, Probabilistic approach to Schoenberg's problem in Birkhoff interpolation, *AMASH* **33** (1979), 127–135.

S. D. RIEMENSCHNEIDER, Birkhoff interpolation at the n -th roots of unity: Convergence, *Canad. J. Math.*, in press.

A. SHARMA, Some poised and non-poised problems of interpolation, *SIAM Rev.* **14** (1972), 129–151.

Problem XXXIII

C. A. MICHELLI AND T. J. RIVLIN, Quadrature formulae and Hermite-Birkhoff interpolation, *Advances in Math.* **11** (1973), 93–112.

G. G. LORENTZ AND S. D. RIEMENSCHNEIDER, Birkhoff quadrature matrices, in "Linear Spaces and Approximation" (P. L. Butzer and B. Sz-Nagy, Eds.), pp. 359–374, ISNM, No. 40, Birkhäuser Verlag, Basel, 1978.

Problem XXXVII

P. VÉRTESI, A problem of P. Turán, *AMASH* **26** (1975), 153–162.

Problem XLV

- J. BAK AND D. J. NEWMAN, Rational combinations of x^{λ_k} , $\lambda_k \geq 0$, are always dense in $C[0, 1]$, *JAT* **23** (1978), 155–157.
- G. SOMORJAI, On discrete linear operators in the function space A , in "Proceedings of the Conference on Approximation Theory, Blagoevgrad, Bulgaria, 1977," in press.

Problems XLVIII, XLIX, and L

- E. A. RACHMANOV, On Steklov's conjecture in the theory of orthogonal polynomials, *Mat. Sb.* **108** (150) (1979), 581–608.

Problem LI

- P. G. NEVAI, "Orthogonal Polynomials," *Memoirs of the Amer. Math. Soc.*, No. 213, Amer. Math. Soc., Providence, R.I., 1979.

Problem LII

- J. SZABADOS, On the asymptotic behaviour of orthogonal polynomials, *Mat. Lapok* **25** (1974), 115–118. [in Hungarian, with an English summary]

Problem LIII

- G. FREUD, On the greatest zero of an orthogonal polynomial, I, *Acta. Sci. Math.* **34** (1973), 91–97.
- G. FREUD, On the coefficients in the recursion formulae of orthogonal polynomials, *Proc. Roy. Irish Acad. A* **76**, No. 1, (1976), 1–6.
- P. NEVAI, Orthogonal polynomials on the real line corresponding to the weight function $|x|^\alpha \exp(-|x|^\beta)$, *AMASH* **24** (1973), 335–342.
- P. NEVAI, Some properties of polynomials orthonormal with weight $(1 + x^{2k})^\alpha \exp(-x^{2k})$, and their applications in approximation theory, *Soviet Math. Dokl.* **14** (1973), 1116–1119.

Problem LVIII

- P. ERDÖS AND G. FREUD, On polynomials with regularly distributed zeros, *Proc. London Math. Soc.* (3) **29** (1974), 521–537.
- P. NEVAI AND J. S. DEHESA, On asymptotic average properties of zeros of orthogonal polynomials, *SIAM J. Math. Anal.* **10** (1979), 1184–1192.
- J. L. ULLMAN, Orthogonal polynomials associated with an infinite interval, to appear.

Problem LIX

- P. G. NEVAI, "Orthogonal Polynomials," *Memoirs of the Amer. Math. Soc.*, 60. 213, Amer. Math. Soc., Providence, R.I., 1979.

Problem LX

- R. ASKEY AND M. ISMAIL, "A Generalization of Ultraspherical Polynomials," MRC Technical Report No. 1851, University of Wisconsin, Madison, 1978.
- R. ASKEY AND J. WILSON, "A Set of Orthogonal Polynomials That Generalize the Racah Coefficients of 6- j Symbols," MRC Technical Report No. 1833, University of Wisconsin, Madison, 1978.
- K. M. CASE, Orthogonal polynomials revisited, in "Theory and Application of Special Functions" (R. A. Askey, Ed.), pp. 289–304, Academic Press, New York, 1975.

- T. S. CHIHARA, "An Introduction to Orthogonal Polynomials," Gordon & Breach, New York, 1978.
- T. S. CHIHARA AND P. NEVAI, Orthogonal polynomials and measures with finitely many point masses, preprint.
- J. S. DEHESA AND P. NEVAI, On asymptotic average properties of zeros of orthogonal polynomials, *SIAM J. Math. Anal.* **10** (1979), 1184–1192.
- J. S. GERONIMO AND K. M. CASE, Scattering theory and polynomials orthogonal on the real line, *TAMS* **258** (1980), 467–494.
- J. S. GERONIMO, On a relation between the coefficients in the recurrence formula and the spectral function for orthogonal polynomials, *TAMS*, in press.
- J. S. GERONIMO AND P. NEVAI, Necessary and sufficient conditions relating the coefficients in the recurrence formula to the spectral function for orthogonal polynomials, *SIAM J. Math. Anal.* in press.
- P. NEVAI, Orthogonal polynomials, in "Problems in Approximation Theory," pp. 65–77, The University of Arkansas, Fayetteville, 1977.
- P. G. NEVAI, "Orthogonal Polynomials," *Memoirs of the Amer. Math. Soc.*, No. 213, Amer. Math. Soc., Providence, R.I., 1979.
- P. NEVAI, On orthogonal polynomials, *JAT* **25** (1979), 34–37.
- P. NEVAI, Distribution of zeros of orthogonal polynomials, *TAMS* **250** (1979), 369–384.
- F. POLLACZEK, Sur une généralisation des polynomes de Legendre, *C. R. Acad. Sci. Paris Ser. A* **228** (1949), 1363–1365.
- F. POLLACZEK, Systèmes de polynomes biorthogonaux qui généralisent les polynomes ultrasphériques, *C. R. Acad. Sci. Paris Ser. A* **228** (1949), 1998–2000.
- F. POLLACZEK, Sur une famille de polynomes orthogonaux qui contient les polynomes d'Hermite et de Laguerre comme cas limites, *C. R. Acad. Sci. Paris Ser. A* **230** (1950), 1563–1565.
- F. POLLACZEK, Sur une généralisation des polynomes de Jacobi, *Mém. Sci. Math.* **131** (1956).

Problem LXVII

- J. SZABADOS, On some problems connected with polynomials orthogonal on the complex unit circle, *AMASH* **33** (1979), 197–210.

Problem LXXI

- P. G. NEVAI, "Orthogonal Polynomials," *Memoirs of the Amer. Math. Soc.*, No. 213, Amer. Math. Soc., Providence, R.I., 1979.

Problems LXXVI and LXXVIII

- D. J. NEWMAN, "Approximation with Rational Functions," CBMS, No. 41, Amer. Math. Soc., Providence, R.I., 1979.
- V. POPOV, Uniform rational approximation of the class V_r and its applications, *AMASH* **29** (1977), 119–129.