

# Stanford

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## Brad Osgood

Professor of Electrical Engineering and, by courtesy, in Education

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### Bio

#### BIO

Osgood is a mathematician by training and applies techniques from analysis and geometry to various engineering problems. He is interested in problems in imaging, pattern recognition, and signal processing.

#### ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering
- Professor (By courtesy), Graduate School of Education
- Member, Bio-X
- Member, Institute for Computational and Mathematical Engineering (ICME)

#### PROGRAM AFFILIATIONS

- Science, Technology and Society

#### PROFESSIONAL EDUCATION

- PhD, Michigan (1980)

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### Research & Scholarship

#### RESEARCH INTERESTS

- Math Education
- Technology and Education

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### Teaching

#### COURSES

##### 2025-26

- Introduction to Matrix Methods: ENGR 108 (Win)
- The Fourier Transform and Its Applications: EE 261 (Aut)

##### 2024-25

- Introduction to Matrix Methods: ENGR 108 (Win)
- The Fourier Transform and Its Applications: EE 261 (Aut)

##### 2022-23

- Introduction to Matrix Methods: ENGR 108 (Win)
- The Fourier Transform and Its Applications: EE 261 (Aut)

## STANFORD ADVISEES

### Doctoral Dissertation Reader (AC)

Ibrahim Gulluk, Renesmee Kuo, Aya Mouallem

### Master's Program Advisor

Marissa Kuo, Pengyu Mo, Marco Vizcarra

### Doctoral (Program)

Peijing Li, Marina Qian, Sarah Zou

## Publications

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### PUBLICATIONS

- **Peter Larkin Duren 1935-2020** *COMPUTATIONAL METHODS AND FUNCTION THEORY*  
Osgood, B.  
2025
- **Fast DFT Computation for Signals With Structured Support** *IEEE TRANSACTIONS ON INFORMATION THEORY*  
Pochimireddy, C., Siripuram, A., Osgood, B.  
2024; 70 (2): 1498-1524
- **Best Möbius Approximations of Convex and Concave Mappings** *COMPUTATIONAL METHODS AND FUNCTION THEORY*  
Chuaqui, M., Osgood, B.  
2023
- **On convolution, convex, and starlike mappings** *STUDIA UNIVERSITATIS BABES-BOLYAI MATHEMATICA*  
Chuaqui, M., Osgood, B.  
2022; 67 (2): 431-440
- **Computing the Discrete Fourier Transform of signals with spectral frequency support**  
Reddy, P., Tej, V., Siripuram, A., Osgood, B., IEEE  
IEEE.2021: 2381-2386
- **Convolution Idempotents With a Given Zero-Set** *IEEE TRANSACTIONS ON SIGNAL PROCESSING*  
Siripuram, A., Osgood, B.  
2020; 68: 4773-81
- **Some results on convolution idempotents**  
Reddy, P., Siripuram, A., Osgood, B., IEEE  
IEEE.2020: 1462-1467
- **Discrete Sampling: A Graph Theoretic Approach to Orthogonal Interpolation** *IEEE TRANSACTIONS ON INFORMATION THEORY*  
Siripuram, A., Wu, W. D., Osgood, B.  
2019; 65 (12): 8119-30
- **A NOTE ON CONVEX CONFORMAL MAPPINGS** *PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY*  
Chuaqui, M., Osgood, B.  
2019; 147 (6): 2655-59
- **LP relaxations and Fuglede's conjecture**  
Siripuram, A., Osgood, B., IEEE  
IEEE.2018: 2525-29

- **CONCAVE CONFORMAL MAPPINGS AND PRE-VERTICES OF SCHWARZ-CHRISTOFFEL MAPPINGS** *PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY*  
Chuaqui, M., Duren, P., Osgood, B.  
2012; 140 (10): 3495-3505
- **Discrete Sampling and Interpolation: Universal Sampling Sets for Discrete Bandlimited Spaces** *IEEE TRANSACTIONS ON INFORMATION THEORY*  
Osgood, B., Siripuram, A., Wu, W.  
2012; 58 (7): 4176-4200
- **SCHWARZIAN NORMS AND TWO-POINT DISTORTION** *PACIFIC JOURNAL OF MATHEMATICS*  
Chuaqui, M., Duren, P., Ma, W., Mejia, D., Minda, D., Osgood, B.  
2011; 254 (1): 101-116
- **SCHWARZIAN DERIVATIVES OF CONVEX MAPPINGS** *ANNALES ACADEMIAE SCIENTIARUM FENNICAE-MATHEMATICA*  
Chuaqui, M., Duren, P., Osgood, B.  
2011; 36 (2): 449-460
- **Schwarzian Norms and two-point distortion** *Pacific J. Math*  
Chuaqui, M., Duren, P., Ma, W., Mejia, D., Minda, D., Osgood, B.  
2011; 254-1: 101-116
- **On a Theorem of Haimo regarding concave mappings** *Annales Univ. Marie Curie-Sklodowska, Mathematica*  
Chuaqui, M., Duren, P., Osgood, B.  
2011; 65 (2): 17-28
- **Schwarzian derivatives of convex mappings** *Ann. Acad. Sci. Fenn.*  
Chuaqui, M., Duren, P., Osgood, B.  
2011; 36: 449-460
- **Injectivity Criteria for Holomorphic Curves in  $C^n$**  *PURE AND APPLIED MATHEMATICS QUARTERLY*  
Chuaqui, M., Duren, P., Osgood, B.  
2011; 7 (1): 223-251
- **OSCILLATION OF SOLUTIONS OF LINEAR DIFFERENTIAL EQUATIONS** *BULLETIN OF THE AUSTRALIAN MATHEMATICAL SOCIETY*  
Chuaqui, M., Duren, P., Osgood, B., Stowe, D.  
2009; 79 (1): 161-169
- **TWO-POINT DISTORTION THEOREMS FOR HARMONIC MAPPINGS** *ILLINOIS JOURNAL OF MATHEMATICS*  
Chuaqui, M., Duren, P., Osgood, B.  
2009; 53 (4): 1061-1075
- **Falling factorials, generating functions, and conjoint ranking tables** *Journal of Integer Sequences*  
Osgood, B., Wu, W.  
2009; 12
- **Schwarzian derivatives and uniform local univalence** *Comp. Methods in Function Theory.*  
Chuaqui, M., Duren, P., Osgood, B.  
2008; 8 (1): 21-34
- **Schwarzian derivative criteria for valence of analytic and harmonic mappings** *MATHEMATICAL PROCEEDINGS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY*  
Chuaqui, M., Duren, P., Osgood, B.  
2007; 143: 473-486
- **Univalence criteria for lifts of harmonic mappings to minimal surfaces** *JOURNAL OF GEOMETRIC ANALYSIS*  
Chuaqui, M., Duren, R., Osgood, B.  
2007; 17 (1): 49-74
- **A generalization of Nehari's p-criterion for univalence** *Complex Variables and Elliptic Equations*

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- Chuaqui, M., Osgood, B.  
2007; 52: 225– 233
- **Schwarzian derivatives of analytic and harmonic functions** *International Conference on Complex and Harmonic Analysis*  
Chuaqui, M., Duren, P., Osgood, B.  
DESTECH PUBLICATIONS, INC.2007: 25–33
  - **Applied Calculus**  
Osgood, B., Gleason, A., Hallett, D. H.  
John Wiley & Sons, New York.2006
  - **Ellipses, near ellipses, and harmonic Möbius transformations** *PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY*  
Chuaqui, M., Duren, P., Osgood, B.  
2005; 133 (9): 2705-2710
  - **Ellipses, near ellipses, and harmonic Möbius transformations**  
Chuaqui, M., Duren, P., Osgood, B.  
2005
  - **Calculus**  
Osgood, B., Gleason, A., Hallett, D. H.  
John Wiley & Sons, New York.2005
  - **Single and Multivariable Calculus**  
Osgood, B., Gleason, A., Hallett, D. H.  
John Wiley & Sons, New York.2005
  - **Multivariable Calculus**  
Osgood, B., Gleason, A., Hallett, D. H.  
John Wiley & Sons, New York.2005
  - **Optimal variable-density K-SPACE sampling in MRI** *2nd IEEE International Symposium on Biomedical Imaging*  
Lee, J. H., Osgood, B., Nishimura, D. G.  
IEEE.2004: 237–240
  - **Curvature properties of planar harmonic mappings** *Comp. Methods in Function Theory*  
Chuaqui, M., Duren, P., Osgood, B.  
2004; 4: 127– 142
  - **The Schwarzian derivative for harmonic mappings** *JOURNAL D ANALYSE MATHEMATIQUE*  
Chuaqui, M., Duren, P., Osgood, B.  
2003; 91: 329-351
  - **Recent progress on the geometry of univalence criteria** *Cont. Math. vol.*  
Chuaqui, M., Osgood, B.  
1999; 240: 75– 87
  - **The Schwarzian derivative, conformal connections, and Möbius structures** *JOURNAL D ANALYSE MATHEMATIQUE*  
Osgood, B., Stowe, D.  
1998; 76: 163-190
  - **Quasiconformal mappings and analysis: A collection of papers honoring F. W. Gehring Papers from the International Symposium held in Ann Arbor, MI, August 1995.**  
Osgood, B.  
edited by Duren, P., Heinonen, J., Osgood, B.  
Springer-Verlag, New York. 1998
  - **John domains and a univalence criterion of Ahlfors** *Results in Mathematics*  
Chuaqui, M., Osgood, B.  
1998; 33: 203–207

- **Coefficients of small univalent functions** *Results in Mathematics*  
Chuaqui, M., Osgood, B., Pommerenke, Ch.  
1998; 33: 79–86
- **Old and new on the Schwarzian derivative** *International Symposium on Quasiconformal Mappings and Analysis*  
Osgood, B.  
SPRINGER-VERLAG. 1998: 275–308
- **Finding complete conformal metrics to extend conformal mappings** *INDIANA UNIVERSITY MATHEMATICS JOURNAL*  
Chuaqui, M., Osgood, B.  
1998; 47 (4): 1273-1291
- **General univalence criteria in the disk: Extensions and extremal function** *ANNALES ACADEMIAE SCIENTIARUM FENNICAE-MATHEMATICA*  
Chuaqui, M., Osgood, B.  
1998; 23 (1): 101-132
- **Functions with prescribed quasimetry quotients** *PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY*  
Chuaqui, M., Osgood, B., Stowe, D.  
1997; 125 (7): 2195-2197
- **Weak Schwarzians, bounded hyperbolic distortion, and smooth quasimetric functions** *JOURNAL D ANALYSE MATHEMATIQUE*  
Chuaqui, M., Osgood, B.  
1996; 68: 209-252
- **John domains, quasidisks, and the Nehari class** *JOURNAL FÜR DIE REINE UND ANGEWANDTE MATHEMATIK*  
Chuaqui, M., Osgood, B., POMMERENKE, C.  
1996; 471: 77-114
- **AN EXTENSION OF A THEOREM OF GEHRING AND POMMERENKE** *ISRAEL JOURNAL OF MATHEMATICS*  
Chuaqui, M., Osgood, B.  
1995; 91 (1-3): 393-407
- **AHLFORS-WEILL EXTENSIONS OF CONFORMAL-MAPPINGS AND CRITICAL-POINTS OF THE POINCARÉ METRIC** *COMMENTARII MATHEMATICI HELVETICI*  
Chuaqui, M., Osgood, B.  
1994; 69 (4): 659-668
- **SHARP DISTORTION-THEOREMS ASSOCIATED WITH THE SCHWARZIAN DERIVATIVE** *JOURNAL OF THE LONDON MATHEMATICAL SOCIETY-SECOND SERIES*  
Chuaqui, M., Osgood, B.  
1993; 48: 289-298
- **THE SCHWARZIAN DERIVATIVE AND CONFORMAL MAPPING OF RIEMANNIAN-MANIFOLDS** *DUKE MATHEMATICAL JOURNAL*  
Osgood, B., Stowe, D.  
1992; 67 (1): 57-99
- **THE SCHWARZIAN DERIVATIVE AND CONFORMALLY NATURAL QUASI-CONFORMAL EXTENSIONS FROM ONE-DIMENSION TO 2-DIMENSION TO 3-DIMENSIONS** *MATHEMATISCHE ANNALEN*  
Chuaqui, M., Osgood, B.  
1992; 292 (2): 267-280
- **The Möbius connection in the bundle of conformal 2-jets** *Idaho State Conf. on Vector Bundles in Complex Di. Geom.*  
Osgood, B.  
1992
- **A GENERALIZATION OF NEHARI'S UNIVALENCE CRITERION** *COMMENTARII MATHEMATICI HELVETICI*  
Osgood, B., Stowe, D.  
1990; 65 (2): 234-242
- **MODULI SPACE, HEIGHTS AND ISOSPECTRAL SETS OF PLANE DOMAINS** *ANNALS OF MATHEMATICS*

- Osgood, B., Phillips, R., Sarnak, P.  
1989; 129 (2): 293-362
- **EXTREMALS OF DETERMINANTS OF LAPLACIANS** *JOURNAL OF FUNCTIONAL ANALYSIS*  
Osgood, B., Phillips, R., Sarnak, P.  
1988; 80 (1): 148-211
  - **COMPACT ISOSPECTRAL SETS OF SURFACES** *JOURNAL OF FUNCTIONAL ANALYSIS*  
Osgood, B., Phillips, R., Sarnak, P.  
1988; 80 (1): 212-234
  - **COMPACT ISOSPECTRAL SETS OF PLANE DOMAINS** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Osgood, B., Phillips, R., Sarnak, P.  
1988; 85 (15): 5359-5361
  - **THE SCHWARZIAN DISTANCE BETWEEN DOMAINS - A QUESTION** *ANNALES ACADEMIAE SCIENTIARUM FENNICAE-MATHEMATICA*  
Osgood, B., Stowe, D.  
1987; 12 (2): 313-318
  - **The quasihyperbolic metric and associated estimates on the hyperbolic metric** *Jour. d'Analyse Math.*  
Martin, G., Osgood, B.  
1986; 47: 37-53
  - **Hyperbolic curvature and conformal mapping** *Bull. London Math. Soc.*  
Flinn, B., Osgood, B.  
1986; 18: 272-276
  - **Some properties of  $f''/f'$  and the Poincaré metric** *Indiana Univ. Math. Jour.*  
Osgood, B.  
1982; 31: 449-461
  - **Univalence criteria in multiply connected domains** *Trans. Amer. Math. Soc.*  
Osgood, B.  
1980; 260: 459-473