Robert Bruce Bauer

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EMPLOYMENT GOAL

Currently seeking a tenure-track position at a four year institution which has a strong commitment to teaching and research. Since both aspects of academia are important to me, I would like to find an institution which balances both of these areas.

PRESENT POSITION

Lecturer, University of Southern California.

Position required teaching two courses per semester and further advancement of my research.

RESEARCH INTERESTS

Spectral methods, Essentially Non-Oscillatory schemes, and Wavelet based numerical methods with emphasis on adaptive grid generation, shock detection and shock tracking. Future research will encompass adaptive grids for semi-conservative schemes and the design and analysis of numerical methods for traffic flow.

EDUCATION

Ph.D. Applied Mathematics, Numerical Analysis.

Brown University, Division of Applied Mathematics. May 1995.
Thesis Advisor: David Gottlieb
Dissertation: “Numerical Shock capturing techniques using Wavelets and High–Pass Filters” Develops and analyzes new shock locating techniques. The first technique uses High–Pass Filters to accurately locate an undetermined number of shocks. The second technique uses high–pass filters to dynamically determine an optimal computational grid for ENO schemes.

M.S. Applied Mathematics.

Brown University, Division of Applied Mathematics. May 1991.

B.A. Applied Mathematics.

University of California, Berkeley. Department of Mathematics. May 1990.

PUBLICATIONS

“A Hybrid Adaptive ENO Scheme”, R.B. Bauer. Developed an adaptive semi-conservative algorithm for computations for the solution of discontinuous PDEs. By maintaining an *optimal* computational grid for this method, computational times were greatly reduced. Submitted to Journal of Computational Physics.

“An Efficient Adaptive Grid ENO Algorithm”, R.B. Bauer. Developed an adaptive grid method applicable to cell-average ENO schemes. Proceeding of the Third International Conference on Spectral and High Order Methods (**ICOSAHOM** 1995).

“Filters for Detecting Shocks”, R.B. Bauer. Developed and analyzed a class of spectral filters which provide highly accurate estimates to multiple shock locations. These shock locations then are used in conjunction with Gegenbauer Polynomials to provide highly accurate reconstruction of discontinuous functions from Fourier coefficients. In progress.

TEACHING EXPERIENCE

Lecturer, University of Southern California. Taught two courses per semester. Courses were *Pre-Calculus*, *Calculus for Business*, *Calculus (I) & (II)*, *Linear Algebra* and *Graduate Numerical Analysis*. See attached students evaluations. 1995-present.

Elementary School Tutor. Volunteer tutor at Clinton Elementary. Provide extra help to young students. 1996-present.

Computer Consultant, Brown University. Held regular office hours to help undergraduates with a wide variety of computer and programming problems in their Applied Mathematics courses. 1992.

Teaching Assistant, *Differential Equations and Linear Algebra*, Brown University. Directed computer help seminars, lead recitation sections, conducted review sessions, and held office hours. 1991.

Teaching Assistant, *Operations Research*, Brown University. Lead recitation sections, conducted review sessions, held office hours, and graded exams. 1991.

Student Tutor, University of California, Berkeley. Selected for university course designed to further improve teaching skills. Learned to assess students needs, stimulate and encourage growth of students, and demystify mathematics for students. 1988–1989.

Grader, University of California, Berkeley. Graded home works for courses in Linear Algebra, ODEs, PDEs, and Numerical Analysis. 1987–1989.

CONFERENCES & WORKSHOPS

International Conference on Spectral and High Order Methods, Houston, TX. May 1995. "An Efficient Adaptive Grid ENO Scheme."

Institute of Computer Applications in Science and Engineering/Langley Research Center Short Course on Wavelets, Hampton, VA. February 1993.

ACADEMIC AWARDS

Sigma Xi, 1995–Present.

Research Assistant, Brown University. 1993–1995.

Teaching Fellowship, Brown University. 1991–1992.

University Fellowship, Brown University. 1990–1991.

REFERENCES

Research

David Gottlieb, Professor
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Chi-Wang Shu, Professor
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Teaching

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