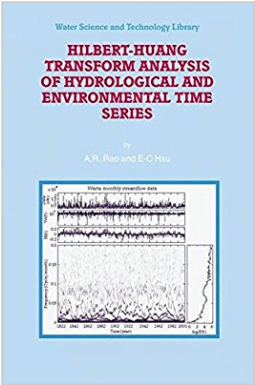

Hilbert-Huang Transform Analysis of Hydrological and Environmental Time Series (Water Science and Technology Library)

By A.R. Rao, E.-C. Hsu

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The Hilbert-Huang Transform (HHT) is a recently developed technique used to analyze nonstationary data. This book uses methods based on the Hilbert-Huang Transform to analyze hydrological and environmental time series. These results are compared to the results from the traditional methods such as those based on Fourier transform and other classical statistical tests.

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Hilbert-Huang Transform Analysis of Hydrological and Environmental Time Series (Water Science and Technology Library) By A.R. Rao, E.-C. Hsu Bibliography

- Rank: #4501616 in Books
- Brand: Ramachandra A Hsu En Ching
- Published on: 2008-03-04
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x .63" w x 6.14" l, 1.25 pounds
- Binding: Hardcover
- 248 pages

Editorial Review

Review

" I believe *Hilbert-Huang Transform Analysis of Hydrological and Environmental Time Series* will satisfy researchers in any discipline who analyze nonstationary and/or nonlinear time series. The book does not claim to be a final word on the merits of the HHT, but it does extend empirical claims regarding the potential effectiveness of the HHT. There are no exercises, although the book could be used in a teaching setting. Overall, I was glad to read the book and believe the HHT is well worth continued study as a potentially effective tool in the challenging area of nonstationary and non-linear time series analysis."

Tom Burr, Statistical Sciences, Los Alamos National Laboratory, Los Alamos, NM, USA

From the Back Cover

The Hilbert-Huang Transform ((HHT) is a recently developed technique which is used to analyze nonstationary data. Hydrologic and environmental series are, in the main, analyzed by using techniques which were developed for stationary data. This has led to problems of interpretation of the results. Environmental and hydrologic series are quite often nonstationary. The basic objective of the material discussed in this book is to analyze these data by using methods based on the Hilbert-Huang transform. These results are compared to the results from the traditional methods such as those based on Fourier transform and other classical statistical tests.

Audience
This book will be of value to researchers interested in climate change and advanced graduate students in civil engineering, atmospheric sciences and statistics.

About the Author

I. GENERAL INFORMATION

Name: A. Ramachandra Rao

Date of Birth: 23 October 1939

Academic Record

School Attended Degree Date

University of Illinois 1964-68 Ph.D. 1968

University of Minnesota 1962-64 M.S.C.E. 1964

University of Mysore (India) 1956-60 B.E. 1960

1. Professional Experience:

Employer Position Date

University of Mysore Lecturer in Civil 1960-62

(India) Engineering

University of Minnesota Research Assistant 1962-64

University of Illinois Research Assistant 1964-68

Purdue University Visiting Assistant 1968-70

Professor

Purdue University Assistant Professor 1970-73

Govt. of New Zealand NRAC Senior Research Fellow 1977-78

Purdue University Associate Professor 1973-80

Purdue University Professor 1980-

Construction Engineering Visiting Faculty May-July, 1983

Research Laboratory Member 1983

Purdue University Acting Head, Hydraulics 1983-84

and Systems Engineering Area

Indian Institute of Science, Visiting Professor of Jan-July,

Bangalore, India Civil Engineering 1989

University of Illinois, Visiting Professor of Jan-May

Urbana, IL Civil Engineering 1998

2. Awards, Honors, Citations

Awarded a Senior Research Fellowship by the National Research Advisory Council, Government of New Zealand, for research in hydrology with the Ministry of Works and Development during 1977-78.

Awarded (but not accepted) a "Senior Scientist Fellowship" by the Alexander Von Humboldt Foundation, West Germany (1977).

Awarded (but not accepted) the "C.H. Munro Fellowship" of the Water Research Foundation of Australia, for research in Hydrology, at Monash University, Clayton, Victoria, Australia (1977).

Honorary Societies

Member, Chi Epsilon, Sigma Xi

Citations

American Men and Women of Science

Who's Who in the Midwest

Who's Who in Frontier Science and Technology

Who's Who in Science and Engineering

Who's Who, Environmental Registry

Who’s Who in the World

Who’s Who in American Education

Invited Activities and Lectures

Invited by UNESCO to attend the "International Symposium on Hydrologic Aspects of Droughts", New Delhi, 3-8 December 1979.

Member, American Delegation to the XVIII General Assembly, IUGG, Hamburg, Federal Republic of Germany, August 15-27, 1983.

Invited Specialist, IAWPRC Seminar on "Rainfall as the Basis for Urban Runoff Design and Analysis", Technical University of Denmark, Lyngby, Denmark, August 24-26, 1983.

Invited lecture, "Detection of Climatic Changes in Hydrologic Time Series". Eighth IHD Endowment Lecture, Anna University, Madras, India, April 13, 1989.

Keynote lecture, "Bayesian Unit Hydrographs" International Conference on Hydrology and Water Resources, Delhi, India, December, 1993.

Member, Editorial Board of "Water Science and Technology Library", Kluwer Academic Publishers B.V. Dordrecht, The Netherlands, (1993-99).

Editor, "Journal of Irrigation and Drainage Engineering", ASCE, 1992 - 1998.

Keynote lecture, "Bayesian Unit Hydrographs" International Conference on Hydrology and Water Resources, Delhi, India, December, 1993.

Founder/honorary member, "Center of Resource Management and Eco-development Studies", I.I.T., Delhi, 1994.

Fellow, Indian Association of Hydrologists.

"Edmund M. Burke Outstanding Civil Engineering Professor", School of Civil Engineering, Purdue University, April 1995.

Invited paper, "Principal Component Analysis of Hydrologic Data", A.R. Rao and T.T. Burke, Jr., NATO Advanced Research Workshop on "Integrated Approach to Environmental Data Systems", Izmir, Turkey, Sept. 16-20, 1996.

Invited to deliver a keynote paper in the International Symposium on "Emerging Trends in Hydrology", Department of Hydrology, University of Roorkee, India, Sept. 25-27, 1997.

tßp, Dean Marion B. Scott 1997 Exemplary Character Award, Purdue University.

Invited speaker, Int. Conference on Water, Environment, Ecology, Socio-Economics and Health Engineering, Seoul National University, Seoul, Korea, Oct. 18-21, 1999.

Invited speaker, Int. Conference on Integrated Water Resources Management for Sustainable Development, Roorkee, India, Dec. 2000.

Invited speaker, Golden Jubilee Celebration of the Civil Engineering Department, Indian Institute of Science, Bangalore, India, July 2001.

Keynote Address, "Studies in Regionalization of Watersheds," International Conference on Water and Environment, Bhopal, India, 20 pp., Dec. 15-18, 2003.

State and National Offices

Chairman of the Engineering Division of the Indiana Academy of Sciences (1978-79)

3. Society Memberships and Activities

Member, American Society of Civil Engineers

Member, American Association for the Advancement of Science

Member, American Geophysical Union

Member, International Association for Hydraulic Research

National Committee Activity

Member, Task Committee on Rainfall-Runoff Quality

Data Systems, Urban Water Resources Council, ASCE (1970-71)

Member, Task Committee on Effects of Urbanization on Low Flow, Total

Runoff, Infiltration and Groundwater Recharge, ASCE (1974-76)

Member, Surface Water Hydrology Committee, Hydraulics Division,

American Society of Civil Engineers (1979-present)

Member, Committee on Surface Water, Irrigation and Drainage

Division, American Society of Civil Engineers (1979-present).

Member, Control Group (1982-present), Vice Chairman (1983-84).

Chairman (1984-85), Past Chairman (1985-86)

Member, Committee on Hydrology, American Meteorological Society (1985-87)

Member, Task Committee on Risk, Hydraulics Division, ASCE (1984-85).

Member, Task Committee on Infiltration Manual, Surface Water Committee, Irrigation and

Drainage Division, ASCE (1986-present)

Member, Control Group, Publications Committee, Irrigation and Drainage Division, ASCE (1986-present)

Member, AGU Committee on Education and Human Resources (1986-1990)

Associate Editor, Journal of Irrigation and Drainage Engineering, ASCE, (1990-1992)

Chairman, Task Committee on Droughts, Irrigation and Drainage Division, ASCE, (1990-1992)

Editor, Journal of Irrigation and Drainage Engineering, ASCE (1992-1998)

Chairman, Task Committee on Droughts, Irrigation and Drainage Division, ASCE, (1990-1992)

Chairman, Task Committee on Engineering Approaches to Coping with Droughts, Water Resources Engineering Division, (1994-1996)

Associate Editor, Journal of Irrigation Engineering, ASCE, (1990-1992)

Member, Surface Water Hydrology Committee, Water Resources Division, ASCE (1986-present)

Chairman, Committee on Publications, Irrigation and Drainage Engineering, ASCE, (1992 - 98)

Member, Task Committee on "Role of Run On Effect on Surface and Subsurface Hydrologic Process", ASCE, Surface Water Committee (2005-2008).

4. Consulting Activities

1. Forest Hills Country Club, Richmond, Indiana. Design of Water Main (1969).

2. The Engineers Collaborative, 110 East Ontario Street, Chicago. Hydrologic design and development of control systems for the flood control reservoir on the north branch of the Chicago River, Deerfield, Illinois (1969-71).

3. Tippecanoe County Surveyor's Office, Industrial park drainage study (1971).

4. "Save Newburgh Waterfront Society", Newburgh, Indiana. Effects of lock and dam construction on the Ohio River on the bank erosion at Newburgh, Indiana (1972).

5. Consultant on Storm Water Flow Measurement into Sewage Treatment Plants of Indianapolis; M.D. Wessler & Assoc. Indianapolis, Indiana (1979-80).

6. Consultant to the city of Greencastle, Indiana, on surcharge in sewer systems in Greencastle (1981).

7. Consultant to the State of Indiana, Office of the Attorney General, in the matter of the Boundary dispute between Indiana and Kentucky, 1981.

8. Consultant in the Matter of Amazon Dam Failure, Indiana 1984.

9. Wolf Construction Co., Logansport, IN. 1985.

10. The city of Portage, IN. 1985.

11. "Mary E. Vinton Estates", Lafayette, IN 1986.

12. Frankfort KY, drainage problems, 1987 - 1990.

13. U.S. AID, "Indo-Nepal Water Problems", Patna, India, 1992.

II. TEACHING AND RELATED ACTIVITIES

1. Courses Taught (only list from 1998) Year Sem. No. Title Cr. Enrollment 1998-99

1 CE 340 Hydraulics 4 109

1 CE 597I Computational Hydraulics 3 6

2 CE 340 Hydraulics 4 71

1999-00 1 CE 549 Watershed Modeling 3 9

2 CE 340 Hydraulics 3 59

2000-01 1 CE 340 Hydraulics 3 80

1 CE 498 Senior Design 3 70

2 CE 542 Hydrology 3 15

2001-02 1 CE 440 Urban Hydraulics 3 15

1 CE 549 Watershed Modeling 3 12

2 CE 542 Hydrology 3 24

2002-03 1 CE 340 Hydraulics 3 80

2 CE 542 Hydrology 3 27

2003-04 1 CE 641 Statistical Hydrology 3 7

2 CE 542 Hydrology 3 22

2004-05 1 CE 349 Hydraulics 3 80

2 CE 542 Hydrology 3 24

III. RESEARCH AND RELATED ACTIVITIES

PUBLICATIONS

I. BOOKS AND BOOK CHAPTERS

1. R.L. Kashyap and A.R. Rao, RUSSIAN Edition of "Dynamic Stochastic Models from Empirical Data" "HAYKA" publishers, Moscow, U.S.S.R., 1983.

2. R.L. Kashyap and A.R. Rao, "Dynamic Stochastic Models from Empirical Data", Vol. 122 in the series, "Mathematics in Science and Engineering", Academic Press, New York, NY, 1976, 330 pp.

3. A.R. Rao, "Stochastic Analysis of Thresholds in Hydrologic Time Series", Chapter 9 in "Thresholds in Geomorphology", Ed. D.R. Coates and J.D. Vitek, George Allen and Unwin, Boston, 1980, pp. 179-209.

4. J.W. Delleur and A.R. Rao, "Linear Systems Analysis in Hydrology - The Transform Approach, The Kernal Oscillations and the Effect of Noise", Paper No. 9 in "Systems Approach to Hydrology", Water Resources Publications, Fort Collins, CO, 1971, pp. 116-142.

5. A.R. Rao and K.H. Hamed, "Flood Frequency Analysis", CRC Press, Boca Raton, FL., 350 pp. 1999.

6. R.S. Govindaraju and A.R. Rao (eds.), "Artificial Neural Networks in Hydrology", Vol. 36, Water Science and Technology Library, Kluwer Academic Publishers, Dordrecht, Holland, 329 pp. 2000.

7. A. R. Rao, "Surface Water Hydrology", Chapter 31, The Civil Engineering Handbook, pp. 31-1 - 31-29, CRC Press, Boca Raton, FL., 2003.

8. A.R. Rao, C.B. Burke and T.T. Burke, Jr., "Urban Drainage", Chapter 32, The Civil Engineering Handbook, pp. 31-1 – 32-12, CRC Press, Boca Raton, FL., 2003.

9. T.T. Burke, Jr., C.B. Burke and A.R. Rao, "Computer Simulation in Hydraulics and Hydrology", Chapter 38, The Civil Engineering Handbook, pp. 38-1 – 38-35, CRC Press, Boca Raton, FL., 2003.

10. A.R. Rao, K.H. Hamed, and H-L Chen, "Nonstationarities in Hydrologic and Environmental Time Series", Klewer Academic Publishers, Dordrecht, Holland, 361 pp. 2003.

11. A. R. Rao and V. V. Srinivas, A Book, "Regionalization of Watersheds – An Approach Based on Cluster Analysis", (Expected 2006).

12. A. R. Rao and En-ching Hsu, A Book, "Hilbert-Huang Transform Hydrologic and Climatic Series", in preparation.

Users Review

From reader reviews:

Martina Smith:

What do you ponder on book? It is just for students as they are still students or the idea for all people in the world, what best subject for that? Simply you can be answered for that concern above. Every person has different personality and hobby per other. Don't to be obligated someone or something that they don't desire do that. You must know how great and also important the book Hilbert-Huang Transform Analysis of Hydrological and Environmental Time Series (Water Science and Technology Library). All type of book is it possible to see on many solutions. You can look for the internet resources or other social media.

Theresa Villarreal:

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