

# DEB CHATTERJEE, Ph.D.

Computer Science and Electrical Engineering (CSEE) Department  
School of Computing and Engineering (SCE)  
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**PRESENT EMPLOYMENT**      **Computer Science & Electrical Engineering (CSEE) Department, School of Computing & Engineering (SCE), University of Missouri-Kansas City (UMKC), Kansas City, MO**  
Assistant Professor (tenure-track) beginning August 15, 1999

**EDUCATION**      **University of Kansas**, Lawrence, Kansas, USA  
Doctor of Philosophy, Electrical Engineering, August 1998

**Concordia University**, Montréal, Québec, Canada  
Master of Applied Science (M.A.Sc), Electrical & Computer Engineering, April 1992

**Indian Institute of Technology**, Kharagpur, West Bengal, India  
Master of Technology (M.Tech), Electronics & Electrical Communication Engineering, June 1983

**Jadavpur University**, Kolkata (Calcutta), West Bengal, India  
Bachelor of Elcetronics & Telecommunication Engineering, June 1981.

**RESEARCH INTERESTS**      Current active research is **Computational Electromagnetics**, illustrated by the following categories:

- Development of *fast, iterative* numerical techniques for rapid parametric optimization and performance modeling of finite ground plane effects in miniature microstrip antennas
- Development of practical design methodology for ultrawideband (U-Slot) microstrip patch antennas
- Development of high-frequency (asymptotic) formulations for mutual coupling and radiation behavior of antennas and arrays flush-mounted on convex surfaces such as in tactical missile, UAVs and other defense communication systems for homeland security applications
- Analysis of electrically large planar, finite microstrip phased arrays of ultrawideband elements for applications to remote sensing
- EM Wave Interaction with Biological Media: *Computational Bio-Electromagnetics*

**FUNDED RESEARCH**      **CSEE Department, SCE, UMKC, KC, MO**  
*Assistant Professor (tenure-track): August 15, 1999 till date*

**Current External and Internal Research Funding**

- (1) Received *external research funding* from Honeywell FM&T, KC, MO for a total of \$24613 (beginning June 15, 2004 to September 15, 2004); project title:Antenna Design on Finite Ground Planes and Adaptive Matching Network Realization; P.I.: (self, 100% shared credit)
- (2) Received *external research funding* from Honeywell FM&T, KC, MO for a total of \$14997 (beginning May 15, 2002 to September 15, 2002); project title:Design, Development and Simulation of a Wideband, Circularly Polarized Microstrip Antenna on Finite Ground Planes; P.I.: (self, 100% shared credit)
- (3) Received *external research funding* from Honeywell FM&T, KC, MO for a total of \$59822 (beginning April 01, 2001 to September 15, 2001); project title:Modeling and Design of Broadband Antennas and their Performance Simulation in Complex Environments; P.I.: (self, 100% shared credit).

- (4) Received *external research funding* from Honeywell Federal Manufacturing and Technologies (FM&T), KC, MO for a total of \$70837 (beginning January 03, 2000 to September 30, 2000); project title: Simulation Design and Development of Miniature, Broadband Low-profile, Antennas for PCS and Cellular Communications; P.I.: (self, 65% shared credit); Co-I: (Dr. Kai-Fong Lee, 35% shared credit)
- (5) Received *competitive internal research funding* from University of Missouri Research Board for a total of \$27,933 (for a period of 12 months); project title: Full-Wave Modeling of Finite, Planar Microstrip Antennas; P.I.: (self, 100% shared credit).

## RESEARCH ACTIVITIES

### **Electrical & Computer Engineering (ECE) Degree Program, CSEE Department, UMKC**

*Assistant Professor (tenure-track): August 15, 1999 till date*

- Currently advising graduate students in developing a fast modeling technique for performance analysis of wideband microstrip antennas on planar substrates, with special emphasis on *finite ground plane diffraction* effects
- Developing a theory of ultrawideband U-Slot microstrip patch antenna based on *segmentation* and *generalized cavity model* approaches
- Developing a numerical model, based on *full-wave approach*, for analysis of *finite* microstrip phased arrays (of probe-fed rectangular and U-Slot microstrip patches), using a very *accurate feed model* for the probe-to-patch junction with applications to remote sensing radars
- Investigating the development of an uniform *asymptotic* (high-frequency) formulation for conformal microstrip arrays for predicting array mutual coupling with applications to UAVs, tactical missiles and other communication systems.
- Was the principal author or co-author of **53** peer-reviewed and refereed articles & abstracts in journals, conference proceedings, symposium and abstract digests, and, **14** contract research technical reports

### **Radar Systems and Remote Sensing Laboratory, The University of Kansas Center for Research**

*Post-Doctoral Research Engineer : January 1998 to August 1999*

- Developed an algorithm for windspeed correction for the SEAWINDS project sponsored by NASA/JPL
- Was the *principal investigator* (PI) in a project involving GPR measurements and use of EM models for characterization of subsurface contaminants sponsored by Kansas Utilities Electric Research Program
- Documented earlier research work on microstrip antennas for wireless applications as technical reports and journal articles

*Graduate Research Assistant: May 1993 to December 1997*

- Completed development of a computer code for wideband microstrip arrays for applications to wireless communications and radar under the partial sponsorship of Honeywell Federal Manufacturing and Technology (FM&T) Corporation
- Developed algorithms for design of and non-adaptive beamsteering with cylindrical conformal arrays for the Rapidly Deployable Radio Networks project sponsored by the Defense Advanced Research Project Agency
- Documented research results in form of refereed journal articles and technical reports; presented research results at refereed international conferences
- Participated in modeling sea-wind characteristics for remote-sensing applications

### **Electromagnetic Compatibility Laboratory, Concordia University, Montréal, Canada**

*Graduate Research Assistant: August 1986 - April 1992*

- Modeled radiation behavior of antennas in vicinity of a complex structure such as ships, aircrafts and vehicles using high-frequency formulations with an emphasis on validating *creeping wave* formulations for applications to modeling coupling between fuselage-mounted antennas
- Developed application-specific computer programs in FORTRAN-77 for validating the formulation of various high-frequency EM simulation softwares such NECBSC, GTDAIR and AAPG codes
- Documented research results in form of technical reports; presented research results at refereed international conferences

### **Radar and Communication Laboratory, IIT Kharagpur, West Bengal, India**

*Graduate Research Assistant: August 1981-June 1983*

- Developed ray-tracing algorithms; used the UTD formulation in conjunction with ray-tracing algorithms to find the radar cross section of a finned cylinder

**Tata Institute of Fundamental Research, Bombay, India**

*Summer Internship: May - July 1982*

- Measured the output characteristics of Waveguide-type Microwave Power Combiners for use in ground-based radars operating in the X band

**TEACHING  
EXPERIENCE**

**CSEE Department, SCE, UMKC, KC, MO**

*Assistant Professor: August 1999 till date*

- Developed and taught a new graduate course *Electromagnetic Scattering and Antenna Theory* (ECE 606) for doctoral and master's students.
- Developed the current new graduate course *Antennas and Propagation for Wireless Systems* and taught it initially as a 'topics' course in winter semesters
- Developed the current new graduate course *R.F./Microwave Techniques for Wireless Systems* and taught it as a 'topics' course during Fall semesters
- Thoroughly revised and taught existing courses (ECE 412 & ECE 413) under the new title *R.F. and Microwave Techniques for Wireless Engineering* during winter semesters for seniors (and graduates).
- Developed the current new undergraduate course *Traveling Waves and Fields* (ECE 302 & ECE 303) and taught it for juniors during Fall semesters.
- Initiated and participated in the development of the new undergraduate course *Engineering Mathematics* (ECE 341).
- Participated in activities related to ECE Degree Program accreditation by ABET in calendar year 2002
- Supervised (and currently supervising) master's (M.S.E.E.) theses

**Department of Electrical Engineering and Computer Science, The University of Kansas**

*Post-Doctoral Research Engineer: January 1998 to August 1999*

- Taught *Electronic Circuits and Devices* for non-EE majors during Fall 1998 and Spring 1999 terms.

*Sessional Lecturer: January 1998 to May 1998*

- Taught a graduate course titled *Advanced Electromagnetic Theory* in the Spring 1998 term

*Sessional Lecturer: June 1996 - May 1997*

- Taught *Electronic Circuits and Devices* for non-EE majors during Fall 1996 and Spring 1997 terms
- Taught *Electronic Circuits* at the junior level for EE majors during Summer 1996 term

*Graduate Teaching Assistant: August 1992 - May 1993*

- Tutored a sophomore-level course on *Electromagnetics* for EE majors

**Department of Electrical and Computer Engineering, Concordia University, Montréal, Canada**

*Graduate Teaching Assistant: August 1986 - April 1990*

- Tutored undergraduate courses on Electromagnetic Theory, Numerical Methods and Circuit Theory

**UNIVERSITY  
SERVICES**

- Currently serving as a member on the Advisory Board for Department of Mathematics and Statistics, UMKC
- Currently serving as member of the SCE Retention and Recruitment Committee
- Currently serving on the campus wide committee of Chancellor's Extended Cabinet
- Served as a SCE faculty member representative on the UMKC Library Committee
- Served as a member on the Dean's ad-hoc SCE Policy Committee during October - November 2002 term
- Currently serving as a member of the CSEE master's admissions & policy committee
- Standing member of the ECE undergraduate curriculum committee
- Member of the SCE doctoral faculty
- Served as faculty committee member (not as thesis supervisor) for seven doctoral candidates since Fall 1999.
- Graduated one master's student in December 2002
- Currently supervising master's thesis for two students

- PROFESSIONAL SERVICES**
- Appointed in March 11, 2004 as the guest co-editor for the special issue of the *Applied Computational Electromagnetics Society Journal* on Review of Computation and Modeling Techniques for Phased Array Antennas.
  - Co-chair of the session Non-Conventional Antennas at the *IEEE AP-S International Symposium and URSI Radio Science Meeting*, Monterey, CA, June 20-26, 2004.
  - Co-chaired the session Antennas for Communications and Diversity Systems at the *IEEE AP-S International Symposium and URSI Radio Science Meeting*, Baltimore, Maryland, July 21-26, 1996.
  - Co-chaired the session Remote Sensing Techniques and Models at the *IEEE AP-S International Symposium and URSI Radio Science Meeting*, Orlando, Florida, July 11-16, 1999.
  - Reviewed (30) technical articles (since 1998) for the following journals:
    - *IEEE Transactions on Antennas and Propagation* (25 articles)
    - *Radio Science* (1 article)
    - *Applied Computational Electromagnetics Society Journal* (1 article)
    - *IEEE Antennas and Wireless Propagation Letters* (1 article)
    - *IEEE Transactions on Vehicular Technology* (1 article)
    - *ETRI Journal* (Electronic Technical Research Institute), Seoul, South Korea, (1 article)
  - Reviewed two research grant proposals for University of Missouri Research Board (UMRB) & two research grant proposals for Kansas NASA EPSCOR (KNEP).
  - Reviewed an article on antenna theory to be published as a chapter for a book titled *The Encyclopedia of Electrical and Electronics Engineering* by John Wiley and Sons, Inc.

**INDUSTRY EXPERIENCE** Radar Division, Avionics & Design Bureau, **Hindustan Aeronautics Limited**, Hyderabad, India  
 Worked as a Staff Engineer from 1983 to 1987; primary duties involved design and characterization of monopulse antenna feeds for Light Combat Aircraft (LCA) radars, experimental characterization of antenna parameters at the Compat Antenna test Range (CATR)

**PROFESSIONAL MEMBERSHIPS** Member of the *IEEE Antennas and Propagation Society*  
 Member of the *Applied Computational Electromagnetics Society*

- GRADUATE STUDENTS**
- (1) **Venkataraman Natarajan**; M.S.E.E (December 2002) & Graduate Research Assistant from August 2000 to December 2002; currently working as a consultant for the company T-Mobile in Seattle, Washington
  - (2) **Hangmei Lin**; M.S. thesis student since Fall 2003 (work in progress); (unfunded)
  - (3) **Edwin Augustine Chettiar**; M.S. thesis student & Graduate Research Assistant from May 2003; (work in progress)
  - (4) **Harini Chintapally**; M.S. student since Fall 2004; currently enrolled in ECE 597 directed reading course
  - (5) **Chaitanya Nelakanti**; M.S. student since Fall 2004; currently enrolled in ECE 597 directed reading course

- OUTREACH ACTIVITIES**
- Served as a judge for the *Senior Engineering Award* for high school senior projects at the Science Pioneers in March 2004 at the Union Station, Kansas City, MO
  - Served as a judge for the *science award* for middle school projects at the Odessa Middle School, Odessa, MO in February 2004
  - Participated in student recruiting activities as organized by School of Computing and Engineering, UMKC

**Last Updated: 12/06/2004**