

Resume of Weng Cho Chew

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WORK EXPERIENCE:

Professor of Electrical and Computer Engineering, UIUC, 2011-present

- Currently working on international collaboration with researchers in Hong Kong, Singapore, Malaysia, Japan, and China.
- Developing new courses and lecture notes requiring multi-physics knowledge.
- Research supervision of graduate and undergraduate students, visiting scholars, and postdocs.
- Research funded by Intel, Schlumberger, KLA-Tencor, Riverside Research, AFRL, NSF.
- Seminar organizer for department and IEEE Local Chapter.
- Editor-in-Chief of PIER Journals and active in PIERS Meetings.

Dean, Faculty of Engineering (On special leave from UIUC)

The University of Hong Kong, 2007-2011

- Head of Faculty of Engineering with five departments in Electrical Electronic Engineering, Mechanical Engineering, Computer Science, Civil Engineering and Industrial and Manufacturing Science Engineering with over 110 teachers and over 2000 students.
- Raised ranking of Faculty to be the top in China, Hong Kong, and Taiwan by 2011.
- Served on Board of Directors of Applied Science and Technology Research Institute of Hong Kong, and also the E-Technology Institute.
- Encouraged China/international engagement, reformed curriculum, raised fund, recruited over 35 teachers, encouraged new research culture, organized field trips to industries.
- Encouraged interdisciplinary research, helped lead an Area of Excellence Research in Theory, Modeling, and Simulation of Emerging Electronics, and interdisciplinary Computational Science and Engineering Program.
- Worked as EIC of JEMWA/PIER Journals, published over 40 papers and finished a book.

Director, Center for Computational Electromagnetics and Electromagnetics Laboratory

University of Illinois, Urbana-Champaign (UIUC), 1995-2007

- Director of a Center and Lab with 6 faculty members, and 55 graduate students, and 10 postdocs.
- Principal Investigator for a multimillion dollar MURI award (6.25M for five years) on "Computational Electromagnetics of Complex Structures." Bested 12 other teams in the competition.
- Originator and co-pioneer of several fast algorithms that allow rapid solutions of large-scale electromagnetics problems on small computers.
- Research group is the holder of world record on largest dense-matrix system solved for electromagnetics (20 million unknowns).
- Chairman of the Computational Science and Engineering Committee in the Department, 2000.

Cheng Tsang Man Visiting Professor

Nanyang Technological University, 2006

Y.T. Lo Endowed Chair Professor

UIUC, 2005-2009

Founder Professor, College of Engineering

UIUC, Aug 1999-2005

Full Professor of Electrical and Computer Engineering

UIUC, August 1990-present

Affiliate Professor, Department of Computer Science

UIUC, March 1999-present

Adjunct Professor

The Electromagnetics Academy, Zhejiang University, China, 2004-now

Distinguished Visiting Scientist, Center for Computational Sciences

Air Force Research Lab, WPAFB, Fall 2003

IBM Visiting Professor, Division of Applied Mathematics

Brown University, Feb 2000-June 2000

Visiting Research Scientist

MIT, Feb 2000-June 2000

Adjunct Visiting Professor

National University of Singapore, January 2000 to December 2001: Advisor to the President of the university.

Visiting Professor

National University of Singapore and Ecole Superieure d'Electricite, France. January-June 1992

Associate Professor of Electrical and Computer Engineering

UIUC, September 1985-August 1990

Other Activities at UIUC and HKU, 1985 until present

- Research in computational electromagnetics, pioneering fast algorithm development, multiple scattering, radar cross section, inverse scattering problems, super-resolution experimental systems, microstrip antennas, well-logging, ground penetrating radar, nondestructive testing system, wave-guide modeling, Casimir force, and solar cell.
- Originator and co-pioneer of several fast algorithms, inverse scattering algorithms, and new ideas.
- Apply inverse scattering methods to bio-electromagnetics and bio-acoustics.
- Parallel computing with computational electromagnetic algorithms on shared memory and distributed memory machines.
- Object-oriented programming for computational electromagnetics.
- Solution of dense large linear system in large-scale computing.
- Serving as chairman of the Computational Science and Engineering Committee, and served as past chairman of the Graduate Committee and Graduate Seminar Committee.
- Associate Director of Advanced Construction Technology Center (89-93).
- Listed in the **List of Excellent Instructors** 17 semesters out of 23 semesters of teaching.
- Wrote a major book with second printing, "Waves and Fields in Inhomogeneous Media."
- Published over 270 journal papers and over 350 conference papers.
- Presidential Young Investigator from 1986-1991.
- Invited lecturer in China, Taiwan, Singapore, and France.
- Developed and co-developed three graduate courses. Presented nine off-campus and on-campus short courses.
- Collaborate with other professors in interdisciplinary research and proposals. Assist junior faculty in developing funded research programs and new courses.
- Active member of Advisory Committee, Admissions Committee, Remote Sensing Committee, Computational Science and Engineering Committee, Faculty Search Committee, Facilities Committee, Electromagnetics Committee, Fellowship Committee, Environmental Task Force Committee, ABET 2000 Committee, Ph.D. Qualifying Exam Committee, and University Senate.
- Consultant with: Schlumberger-Doll Research, Schlumberger Well Services, Mobil, Northrop, CDRM Corp., Raton Technology, Lockheed, SciComp, DEMACO, Chevron, ExxonMobil, HRL Laboratories.

Department Head, Electromagnetic Physics

Schlumberger-Doll Research (SDR), Ridgefield, CT, September 1984-September 1985

- In charge of a department with 3 programs and a budget of \$4 million, 9 Ph.D. scientists, and 10 support staff. The department performed research in electromagnetic modeling, numerical analysis, experimental systems, and optics.
- Supervised inverse scattering research, signal and image processing, control theory work.
- Studied and developed NMR measurement concepts in a borehole environment.

Program Leader of Electromagnetics Program

SDR, January 1983-September 1984

- Coordinated a research program that comprised 6 Ph.D. scientists and 4 support staffs.
- Performed research and analysis of wave and field interactions with complex geological environment. Solved complex boundary value problems, analyzed the propagation of electromagnetic pulses through complex media, and studied inverse scattering problems and their applications to geoelectromagnetics.
- Worked closely with theorists, experimentalists and signal processors to solve new problems and developed new measurement ideas in hydrocarbon detection, such as hardware design and data analysis.
- Teamwork resulted in the transfer of a project and several computer software to the engineering branch of Schlumberger.
- Studied the electrochemical and electrokinetic effects of colloidal systems, which provided a basic understanding of the electrical dispersion effects in composite materials such as rocks, clays, polymers, and biological cell suspensions.

Member of the Professional Staff, SDR, June 1981-January 1983

- Performed research and worked with experimentalists on the theoretical analysis of measurement ideas and helped in conceiving new measurement ideas.
- Studied the dielectric dispersion and electrochemistry effect of rocks and composite media. Provided advice in acoustic wave propagation.

Summer Student Intern, SDR, summers of 1978 and 1979

- Performed mathematical and numerical analysis of electromagnetic geophysical prospecting tools in a borehole, transient analysis of anomalous lateral wave.
- Solved mixed boundary value problems of low frequency measurement tools in complex environment.

Postdoctoral Research Associate and Part-Time Instructor

Massachusetts Institute of Technology (MIT), Cambridge, MA, 1973-1981, June 1980-June 1981

- Research was in the use of numerical and analytical methods of mixed boundary value problems.
- Studied matched asymptotic expansion method and the Wiener-Hopf technique in obtaining simple formulas for the resonant frequencies of microstrip antennas and guided modes on microstrip transmission lines.
- Taught most of an advance electromagnetic theory course to graduate students and assisted in teaching an antenna theory course.
- Provided useful assistance to other graduate students and wrote proposals.

Graduate Research and Teaching Assistant, MIT, 1976-1980

- Researched in numerical and asymptotic methods for evaluating electromagnetic interference fringes for geophysical probing.
- Studied numerical, asymptotic, and analytic methods for mixed boundary value problems for microwave integrated circuits, microstrip antennas, microstrip lines, and well-logging tools.
- Assisted in teaching undergraduate and graduate courses in electromagnetics.

Undergraduate Research Staff, MIT, 1973-1976

- Built and analyzed an IMPATT diode microwave amplifier, later used for microwave mode-locking by Herman Haus.

EDUCATION:

Doctoral degree in Electrical Engineering, June 1980

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

- Concentration in the solving of mixed boundary value problems for microstrip circuits, antennas, and geophysical prospection applications.
- Studied scattering theory of continuum random, discrete random media, rough surface scattering of waves, radiative transfer theory, extremely low frequency wave propagation in the earth-ionosphere cavity, and the propagation of borehole acoustic waves.
- Doctoral thesis dealt with mixed boundary value problems for microstrip and geophysical prospection applications, and their solutions with numerical, analytical and perturbation analyses. Advisor: Prof. J. A. Kong.

Master's and Electrical Engineer's degrees in Electrical Engineering, January 1978, MIT

- Concentration in electromagnetic wave theory, power systems, power electronics, signal processing, physics, applied mathematics, and numerical methods.
- Master's and Engineer's thesis was on the numerical and analytic evaluation of electromagnetic field interference fringes due to a dipole antenna on a stratified earth. Particular attention paid to the uniform asymptotic evaluation of the field near the anomalous region where geometrical optics theory breaks down. Advisor: Prof. J. A. Kong.

Bachelor of Science in Electrical Engineering and Computer Science, September 1973-June 1976, MIT

- Concentrated in microwave circuits, electronics, communications, physics, computers, and economics.
- Did programming in FORTRAN, APL, ALGOL, LISP, TEX, MACSYMA, and assembly language.
- Participated in the Undergraduate Research Opportunity Program in microwave circuit research. Bachelor thesis, advised by Prof. M. S. Gupta, on the computer-aided design of IMPATT diode microwave amplifier with microwave integrated circuits using computer optimization.

TEACHING EXPERIENCE:

- Taught three new courses in ECE after 2011. Constantly improving on graduate courses.
- Instructed graduate and undergraduate level courses at the University of Illinois. Developed and co-developed three new graduate courses.
- Cited many times (17/23) in the University **List of Excellent Instructors**. Organized short courses on and off campus. Supervised over 43 theses (M.S. and Ph.D.).
- Supervised many students that win awards: An undergraduate (**M. Lopez**) won an Engineering Open House Award. **Y.M. Wang** was a **finalist** in the 1991 URSI Student Best-Paper Award. **R. Wagner** was a **winner** the 1994 APS best-paper award. **C.C. Lu** won the Departmental Best Graduate Student Research Award. **C.C. Lu** was again a **finalist** in this 1995 APS Best Student Paper Award. **F.C. Chen** was the **winner** of the APS Best Student Paper Award in 1998. **F. Teixeira** was a **winner** of the MTT Fellowship in 1998. **F. Teixeira** won third place in the URSI Best Student Paper Competition during the January of 1999. **E. Forgy**, winner of APS Best Student Paper Award in 1999, with **F. Teixeira** as runner up. **C. Pan** won the EPEP IBM Best Student Paper Award.
- Mentor of junior faculty members who are winners of numerous career awards and departmental awards.
- Part-time instructor for most of an advanced electromagnetic wave theory course for graduate students at MIT in the fall semester of 1980. Lectured in graduate courses on special topics in electromagnetic wave propagation. Helped teach antenna theory course for graduate students.
- Teaching assistant for four semesters while a graduate student in the Electrical Engineering Department of MIT.
- Presented an Independent Activities Period mini-course on fringing field capacitance at MIT in January 1981.
- Private tutor in mathematics as part-time work during high school, and high school teacher for

six months.

ACADEMIC HONORS AND AWARDS:

- Selected to receive the IEEE Electromagnetics Award in 2017
- Selected to be candidate for President Elect for Antennas and Propagation Society, 2017
- ACES Award in Computational Electromagnetics, 2015
- Associate, Center for Advance Study, 2015
- George and Ann Fisher Distinguished Professor of Engineering, 2014
- Election to US National Academy of Engineering, 2013.
- ASTRI Board of Directors, Hong Kong, 2008-2012.
- HKIE Council Member, 2009-2010.
- Fellow, HKIE, 2009.
- Member of E-Business Technology Institute Board, 2007-2011.
- Editor-in-Chief, Journal of Electromagnetic Waves and Applications 2008-2012.
- Editor-in-Chief, Progress in Electromagnetic Research, 2008-present.
- IEEE Antennas and Propagation Symposium Chen-To Tai Distinguished Educator Award, 2008.
- Fellow, Electromagnetics Academy, 2007.
- IBM Faculty Award, 2007.
- IBM Faculty Award, 2006.
- Cheng Tsang Man Visiting Professor, Nanyang Technological University, Singapore, 2006.
- IEEE AP Distinguished Lecturer, 2005/2006/2007.
- Y.T. Lo Chair Professor, 2005.
- Fellow, Institute of Physics, 2004.
- Fellow, Optical Society of America, 2003.
- ISI Most Highly Cited Authors (Top 0.5%), 2002.
- AdCom member, IEEE Antennas and Propagation Society, 2001.
- Schelkunoff Best Paper Award, IEEE Trans. Antennas and Propagation, 2001 (coauthor).
- Campus Wide Excellence in Professional and Graduate Teaching Award, UIUC, 2001.
- Presented five invited plenary talks in 2000.
- Year 2000 IEEE Graduate Teaching Award.
- Honorary mention, Campus Wide Professional and Graduate Teaching, 2000.
- Review Panelist for ECE Graduate Program at Texas A&M with G. Heyt and Y. Patt, 2000.
- First-authored work cited over 1,000 times according to 1999 ISI citation index.
- Founder Professor, College of Engineering, University of Illinois at Urbana-Champaign, 1999-2005.
- Invited Lecturer at Taiwan High Performance Computing Center, with T. Itoh and A. Oliner, 1997 (youngest member of the team).
- MURI Award, 1995 (bested 12 other teams in the competition).
- Fellow, IEEE, 1993.
- Presidential Young Investigator Award, 1986.
- Invited Speaker in many international symposia.
- List of Excellent Instructors at UIUC, many times.
- Past Ad Com member of *IEEE-Geoscience & Remote Sensing*.
- *Who's Who in America, Who's Who in Education, Who's Who in Asian American, Who's Who in the Frontiers of Science and Technology, Who's Who in the Mid West*
- Listed in *International Youths of Achievements, Outstanding Young Men of America*
- Member of URSI, APS, SIAM, OSA, Active Member of S.E.G.
- Member of TAU BETA PI, ETA KAPPA NU and SIGMA XI
- M.I.T. Scholarship for undergraduate education from 1973-1976.
- First in graduating class from high school.

JOURNALS AND PROPOSALS REVIEWED:

- IEEE-AP, IEEE-MTT, IEEE-GRS, Radio Science, JOSA, AEU, Geophysics, J. Colloid Interface Science, Physical Review Letters, IOP, Electromagnetics, JEWA, Inverse Problems, and Mathematical Reviews.
- Reviewer for NSF, ARO, NASA, and overseas (Israel, Saudi Arabia, Russia, Singapore, Hong Kong) proposals.

CHAIRMAN AND EDITORSHIP:

- Editor-in-Chief, PIER Journals, 2008-present
- Organizer and co-chairman of an international workshop on "Waves in Inhomogeneous Media," held August 8-9, 1985 at Schlumberger-Doll Research.
- Session Chairman of Antenna Application Conference at Monticello, Illinois, '86, '96, '00, '03. Technical committee member and session chairman of IGARSS '85, '87, '90. Session Chairman of APS/URSI Symposium, '88, '89, '90, '92, '93, '94, '95, '97, '98, '99, '00, '01, '02, '03, '04. Session Chairman/Organizer of PIERS '89, '91, '93, '95, '97, ACES '93, '95, '97, '99, '03, ICEAA '97, '99, '01.
- Chairman of MURI Kickoff Meeting, Dec 1995.
- Chairman of Government/Industry/CCEM Workshop, April 1998.
- Guest Editor of *Radio Science* (86), *International Journal of Imaging Systems and Technology* (91), *Electromagnetic* (96), *IEEE Geoscience & Remote Sensing* (00), *Inverse Problems* (04), *Waves in Random and Complex Media* (08).
- Associate Editor for *IEEE-Geoscience & Remote Sensing* (past), *J. Electromagnetic Waves Applications*, *Electromagnetics*, *Microwave Optical Technology Letters*.
- International Steering Committee, PIERS 99, 03-present, APMC 99, 08, EDAPS, 09.
- Technical Program Committee, APS-URSI '04, '05, APMC'08.

PATENTS:

- Co-authored eight U.S. Patents.

PUBLICATIONS:

- Authored one book with second printing, coeditor of a second book, coauthor of a third book, and published over 400 journal articles in refereed journals, and over 550 conference publications, written 11 book chapters, supervised over 48 theses. Detailed information available on request.

LANGUAGES:

- Fluent in English. Speak Mandarin, Cantonese, and passable Hainanese. Speak and read some Malay and French.