

Greg P. Kochanski

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Technical Specialty ◇ Phonetics and Cognition. Mathematical modeling of complex systems such as language, speech, and biomechanics. Psycholinguistics and experiment design.

- ◇ Eighteen papers with more than 30 citations, at least 1700 citations in total (Web of Science). Nineteen conference papers, two book chapters, and 12 papers in refereed journals since 1/1/2001.
- ◇ More than 30 U. S. and/or E. U. Patents granted.

Research ◇ **University of Oxford**, 6/2003-present Oxford, UK
Research Fellow, Oxford University Phonetics Laboratory. Exemplar Theory and statistical measures of rhythm. Linguistic studies of intonational phonology and Advanced Tongue Root. Acoustic properties associated with accent and prominence. Acoustic measures of phonological distance. MRI imaging studies of speech articulators; new image processing techniques. Models of motor control for the tongue. Psycholinguistics, mathematical models of speech, models of prosody and intonation of different dialects of English. Signal processing for MRI noise reduction.

- ◇ **Rutgers University**, 9/2002-6/2003 NEW BRUNSWICK, NJ
Visiting scholar. Also consulting scientist for University of California, San Diego, Dept. of Mechanical and Aerospace Engineering.
- ◇ **Bell Laboratories/Lucent Technologies**, 5/1987-9/2002 MURRAY HILL, NJ
Member of Technical Staff.
- ◇ **Modeling of Articulatory Dynamics for Speech**, 1996-9/2002: Modeling of speech and intonation, using novel physiologically-based models of speech generation. This led to a flexible description of intonation, and the first quantitative understanding of how one can emphasize a word in Chinese. Signal processing for improved speech data acquisition.
- ◇ **Speech** 2001-2002: Developed acoustic reverse Turing test to protect speech interfaces against automated attacks (applying speech recognition for data security). Microphone arrays and signal processing for improved speech data acquisition. Designed speech synthesizers. Computational linguistics.
- ◇ **Astrophysics**, 1994-1999: Observational astrophysics, using strong gravitational lensing as a probe of the mass distribution in clusters of galaxies. Also, precise measures of galaxy variability from archival images.

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- ◇ **Classifiers and Human Interfaces**, 1995-1996: Developed techniques for automatic fruit and vegetable identification and classification, based on multiscale measurement of texture. Human interface studies: optimal keyboard designs for two-way pagers.
- ◇ **Nanomaterials and Field Emission**, 1993-1999: Studies of field-emission from diamond and carbon nanotubes. Led team of 2-6 researchers. Achieved record current densities for diamond emitters, and high performance carbon nanotube emitters. Design of structures for field emission displays and microwave amplifiers.
- ◇ **Condensed Matter Physics**, 1987-1994: Scanning tunneling microscope (STM) studies of Si and Al surfaces, studying atomic, electronic structure, and step interactions. Design and construction of STM with highly interactive computer/ hardware interfaces. Investigations of conductivity and chemistry of C₆₀-metal compounds.

- Education*
- ◇ **University of Oxford (Oxford Learning Institute)**, 2008-9 OXFORD, UK
“Developing Academic Practice” seminar/workshops: “Lecturing” (1h), “Class Teaching” (3h), “Tutorial Teaching” (1h)
 - ◇ **Massachusetts Institute of Technology**, 1982-1987 CAMBRIDGE, MA
Ph.D. thesis: “Magnetic Trapping and Cooling of Atomic Hydrogen.” Modeling and measurement of spatial, momentum, and spin distributions, along with chemical reaction rates. Built and modeled a novel low-temperature hydrogen maser.
 - ◇ **1978-1982** S.B. Physics. First place, Mechanical Engineering Design Contest. Computer science and Engineering courses.

- Teaching*
- ◇ **Graduate Supervision** Co-supervision of two D.Phil students.
 - ◇ **University of Oxford**, Hilary Term 2009 OXFORD, UK
Tutorial course for Paper XII, “Psychoinguistics.”
 - ◇ **University of Oxford**, Michaelmas Term 2008 OXFORD, UK
Tutorials for Paper XIII, “General Linguistics.”
 - ◇ **University of Oxford**, Hilary Term 2004, 2005, 2006 OXFORD, UK
“Mathematical Models of Speech and Language.” (<http://kochanski.org/gpk/teaching/04010xford>).
 - ◇ **Oxford Tutorials** Statistics (early 2008), Psycholinguistics (Autumn 2008)
 - ◇ **Montclair State University**, Summer 2002 MONTCLAIR, NJ
Developed and taught a new graduate course in the Linguistics department: “Mathematical Models of Language Phenomena.”
 - ◇ **ICSLP2002**, 9/15/2002 DENVER CO
Prosody and Prosodic Modeling; Three-hour tutorial at The Seventh International Conference on Spoken Language Processing.
 - ◇ **Bell Laboratories**, various years MURRAY HILL, NJ
Five summer students, pre- and post-graduate.

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- Research Funding*
- ◇ UK JISC (Joint Information Systems Committee) and US NSF (National Science Foundation): "Digging into Data: Mining a Year of Speech", 2010-2011, co-I.
 - ◇ UK Economics and Social Research Council award RES-062-23-1172, *Testing theories of speech production with neologisms*, 2008-2011. Principal investigator. (£400k.)
 - ◇ UK Economics and Social Research Council award RES-062-23-1323, *Comparing dialects using statistical measures of rhythm*, 2008-2010. Principal investigator. (£340k.)
 - ◇ Helped write successful John Fell fund research proposal *Surveying naturally-occurring speech in the British National Corpus*, 2008.
 - ◇ UK Economics and Social Research Council award RES-000-23-1094, *Articulation and Coarticulation in the Lower Vocal Tract*, 2005-2008. Principal investigator. (£350k.) This project was evaluated by the ESRC and rated "Outstanding."
 - ◇ Co-I on UK Arts and Humanities Research Council grant, *ICT Tools for Searching Annotation and Analysis of Audio-Visual Media*, 2005-2006.
 - ◇ Oxford University Research Development Fund award RDF/1*181, *Using Iterative Mimicry to Probe the Mental Representation of Intonation*, 2004-2005. Principal investigator.
 - ◇ Research support at Bell Laboratories, 1987-2002.
 - ◇ Cerro Tololo Inter-American Observatory telescope time grant, *Deep Lens Survey*, 1Q 2002.
 - ◇ Hubble Space Telescope telescope time grant, *UV Extinction in Dusty Ellipticals*, approved 1999 (cycle 9).
- Other*
- Member of appointment committee for 4 postdoctoral researchers, (Chair of two).
Montclair State University Linguistics Department Advisory Board, (Montclair, NJ) 2002, 2003.
- Reviewer for four European national research councils, at least five international scientific journals, and two conferences.
- Currently external examiner for Ph.D. thesis at INRS (Université du Quebec) in the field of speech signal processing.
- Managed technicians and post-doctoral researchers.
- Group leader. Community theatre experience. Pilot, 500 hours flight time. Hiking.