

George Papcun, Ph.D. 505 986 9636 WEB SITE: www.SoundEvidence.com gpapcun@gmail.com

Ph.D. University of California Los Angeles, Linguistics, Specialization in Acoustic Phonetics
M.A. University of California Los Angeles, Formal Linguistics
B.A. University of Arizona, Mathematics

FORENSICS: Because of his research background, Dr. Papcun has served as an expert witness and consultant in many legal cases. He has served as a consultant to law enforcement agencies at the local, state and national level.

Notable forensic analyses include:

State of Florida v. George Zimmerman (for Mr. Zimmerman) Rodney King v. City of Los Angeles (for Mr. King) Alaska v. Exxon [Valdez] (for Exxon) California v. O. J. Simpson (for Associated Press) Daniel v. Kelly Oil (for Kelly Oil) Homicide of Jon Benet Ramsey (for City of Boulder, CO) Paula Abdul recording (for Ms. Abdul) Queen v. Kashani-Malaki (Australia, for Kashani) California v. Wm. and Emily Harris (Patty Hearst kidnapping, for Harris) Gonzales v. Trinity Marine (for Trinity Marine) Putative "Elvis" recording (appearance on Good Morning America) CBS 48 Hours Mystery "The Murder and the Mortgage BBC Documentary Appearance in "The 9-11 Road Trip"

AWARDS:

Ford Foundation Fellowship (Graduate) National Defense Education Fellowship (Graduate) Johns Hopkins University Award for Computing to Aid Persons with Disabilities R&D-100 Award for Technological Innovation National Merit Scholarship (Undergraduate) **REVIEWER:** National Science Foundation, National Institutes of Health, Strategic Defense Initiative Organization, Journal of the Acoustical Society of America, Asian Journal of Criminology

AUTHOR and INSTRUCTOR: "Voice Input/Output for Computers" As an author and senior instructor for the technical course Voice Input/Output for Computers" (for the Learning Tree company) Dr. Papcun has taught scientists, and engineers for companies and governmental agencies in the United States and abroad including IBM, Bell Laboratories, The United States Department of State, The United States National Bureau of Standards, Phillips, Siemens and others. Invited lecture: Forensic Linguistics, University of Southern California, April, 2014.

SPECIAL ASSIGNMENTS: Dr. Papcun has completed assignments for United States intelligence agencies including the Central Intelligence Agency, the National Security Agency and the Secret Service.

R&D 100 AWARD: Dr. Papcun led the Los Alamos National Laboratory research team that developed the "Animated Display of Inferred Tongue, Lip and Jaw Movement," which was selected as an R&D-100 winner, which is accorded to the 100 most significant technical developments in a year, and was also selected as a National Merit Award winner by the Johns Hopkins National Search for Computing to Aid Persons with Disabilities. This technology uses acoustic analysis to infer a person's articulatory positions when she or he talks into a microphone attached to a specially equipped personal computer. It has applications in speech therapy, in teaching the deaf to speak, and in improving the accuracy of computerized speech recognition.



PROJECT EXPERIENCE

Voice Lock Analysis

Investigating factors that lead to weaknesses in voice lock systems, including factors that can be exploited in penetrating voice locks. Sponsor: National Security Agency. Role: Principal Investigator.

Detecting terrorist deception and intent:

Beyond polygraphy, taking situation into account, developing advanced technology for detecting terrorist deception and intent. Sponsor: Department of Homeland Security. Role: Developing overall strategy for research.

Link Analysis:

"Who Do" Discovering extended connections among people and institutions, Sponsor: CIA, Role: Principal Investigator.

Voice Stress Analysis for Secret Service Employment Testing

Determining factors that differential stress in various parts of an employment interview for the United States Secret Service. Role: Voice analysis and statistical analysis.

Text analysis and information extraction:

Extracting protein/protein interactions from research articles in biological literature. Sponsor: Procter and Gamble. Role: Researcher for information extraction.

Extracting kinase interactions from research articles in biological literature. Sponsor: Laboratory Research and Development project, Role: Researcher for information extraction.

Extracting information about terrorist activities from HUMINT reports and open source literature. Sponsor: [Not to be released] and Division and Laboratory Directed Research and Development, Role: Researcher for information extraction.

Lexical management for interoperable systems:

Making diverse systems and terminology commensurable. Sponsor: Department of Homeland Security, Role: Researcher for lexical management.

Critical infrastructure decision support:

Providing a model of U.S. critical infrastructures in such a way as to support decisions regarding resource allocation and crisis intervention. Sponsor: Department of Homeland Security. Role: Researcher for model creation.

Recording spoofing:

Creating demonstrations in which speakers seemed to say things they did not in fact say. Sponsor: Laboratory Research and Development. Role: Principal Investigator.

EMPLOYMENT

1971-Present: Forensic Consultant

1982- 2005: Los Alamos National Laboratory, Member of the Technical Staff in the Computer Research Division, Team Leader

1986-1988: Member of the Executive Committee, Center for Nonlinear Mathematical Studies, Los Alamos National Laboratory

1980-1983: Integrated Computer Systems "The Learning Tree" Author and Senior Instructor

1970-1973: Phonetics Laboratory, University of California, Los Angeles, Research Associate

1973-1976: Aerospace Corporation, El Segundo, CA, Member of the Technical Staff

SELECTED PUBLICATIONS

Papcun, G., K. Sentz, A. Fulmer, J. Xu, O. Lubeck, M. Wolinsky "(2003) "A Construction Grammar Approach to Extracting Regulatory Relationships from Biological Literature," *Pacific Symposium on Biology*, Kauai, HI, Jan. 3-7.

Nix, D., G. Papcun, J. Hogden and I. Zlokarnik (1996) "Two Cross-Linguistic Factors Underlying Tongue Shapes for Vowels," *Journal of the Acoustic Society of America* **99**, 3707-3717.

Papcun, G., J. Hochberg, F. Laroche, T. Thomas, J. Zacks and S. Levy (1991) "Inferring Articulation from Acoustics and Recognizing Gestures with a Neural Network Trained on X-ray Microbeam Data," *Journal of the Acoustical Society of America* **92**, 688-700.

Hochberg, J., S. M. Mniszewski, T. Calleja, and G. J. Papcun (1991) "A Default Hierarchy for Pronouncing English," *IEEE Transactions on Pattern Analysis and Machine Intelligence* **13**, 957-964,.

Papcun, G. J., J. Kreiman and A. R. Davis (1989) "Long-term memory for unfamiliar voices," *Journal of the Acoustical Society of America* **85**, 913-925.

Papcun, G. S. Krashen, D. Terbeek, R. Remington and R. Harshman, (1974) "Is the Left Hemishphere Specialized for Speech, Language or Something Else?" *Journal of the Acoustical Society of America* **55**, 319-327.

Report on the Rodney King Trial Analysis (1999) in "**Letters of the Century**" Grunwald and Adler (Eds.) Dial Press.

Rice, L. and G. Papcun, (1980) Voice I/O for Computers, Integrated Computer Systems, Learning Tree Press, Santa Monica, CA.

Hochberg, J., F. Laroche, S. Levy, G. Papcun, & T. R. Thomas (1992) "An Animated Display of Tongue, Lip and Jaw Movements During Speech: A Proper Basis for Speech Aids to the Handicapped and Other Speech Technologies," *IEEE New Directions Proceedings.*

Papcun, G. (1992) "A New Approach to Computerized Speech Analysis," *Los Alamos National Laboratory Research and Development Reports*, July 1992.

Kreiman, J. and G. Papcun (1991) "Comparing Discrimination and Recognition of Unfamiliar Voices," *Speech Communication* **10**, 265-275.

An, Z. S. M. Mniszewski, Y. C. Lee G. Papcun and G. Doolen (1989) "Hiertalker: A default hierarchy of High Order Neural Networks that Learns to Read English Aloud," *Proceedings of IEEE International Conference on Neural Networks*, July 24-27, 1988, San Diego, CA.

Marusak, N. L., K. P. Berkbigler and G. Papcun (1989) "An Expert System for Assisting in Geologic Site Characterization," *Proceedings of the* 5th Symposium on Containment of Underground Nuclear Detonations, September 18-22, 1989, Santa Barbara, CA.

Berkbigler, K. P. G. Papcun, N. Marusak and J. Hutson (1989) "Applying Expertise to Data in the Geologist's Assistant," *Proceedings of the American Nuclear Society Third Topical Meeting on Robotics and Remote Systems,* March 13-16, 1989, Charleston, SC.

Davis, A. R. and G. Papcun (1987) "The Structure Underlying a Semantic Domain" in **The Mathematics of Language**, Manaster-Ramer (Ed.) Benjamins, The Netherlands.

Papcun, G. and A. R. Davis (1987) "What it Means to Convince," Presented at *The Congress of Mathematical Linguistics*, University of Michigan, November, 1987.

Papcun, G. and J. Kreiman (1988) "Voice Features in Long-Term Memory," (Abstract) Journal of the Acoustical Society of America.

Thomas, T. R. G. Papcun, S. Willey and K. Ganethan (1988) "Enhanced Speaker Identification through the Use of Cepstral Coefficients and Redundant Time-Frame Elimination," *Journal of the Acoustical Society of America* **83**, S53.

Thomas, T. R. E. Peter and G. Papcun (1987) "Speech and Speaker Recognition by Simulated Neural Net," *Center for Nonlinear Studies*, Los Alamos, NM December, 1987.

Papcun, G. (1987) "Voice I/O and Natural Language Interfaces for Problem-Solving Environments," in **Problem Solving Environments for Scientific Computing, Ford, B. and F. Chatelin (Eds.)** North-Holland, Elsevier: New York. Originally presented at IFIP TC 2/Working Conference on Problem-Solving, June 17-25, Sophia-Antipolis, France. Papcun, G., A. R. Davis and W. Ford (1984) "The Use of Dynamically Varying Thresholds as a Means of Improving the Performance of Voice Input Systems," *Voice I/O Systems Applications Conference 84 Proceedings*, Arlington, VA, September, 1984.

Papcun, G. (1984) "Discriminant Analysis of Speech Spectra," Invited Presentation to Stanford Auditory Prosthesis Working Group.

Papcun, G., W. Ford and A. R. Davis (1983) "Signal Detection and Classification Analyses of *Voice Input Systems,*" *Proceedings of the Annual Meeting of the American Voice I/O Society.*

Papcun, G. and J. Kreiman (1983) "Signal Detection Analysis of Voice Recognition at Three Delay Intervals," Journal of the Acoustical Society (Abstract) Program of the 105th Meeting of the Acoustical Society of America.

Papcun, G. (1976) "How May Vowel Systems Differ?" *Working Papers in Phonetics*, **31**, UCLA Phonetics Laboratory.

Ladefoged, P. L. and G. Papcun, "Two Voiceprint Cases," Working Papers in Phonetics 31, UCLA.

Papcun, G., S. Krashen, D. Terbeek and R. Remington, (1974) "Is the Left Hemisphere Specialized for Speech, Language or Something Else?" *The Journal of the Acoustical Society of America* **55**, 319-327.

Papcun, G. (1973) Voiceprint Application Manual, Aerospace Corporation, El Segundo, CA.

Papcun, G. (1973) "The Effects of Psychological Stress on Speech," Invited Paper Presented at the 86th Meeting of the Acoustical Society of America, Abstract published in the *Journal of the Acoustical Society of America* **52** (Supplement 1) 62-63.

Ladefoged, P., L. R. Silverstein and G. Papcun (1973) "The Interruptibility of Speech," *The Journal of the Acoustical Society of America* **54**, 1105.

Ladefoged, P. L., J. DeClerk, M. Lindau and G. Papcun (1972) "An Auditory-Motor Theory of Speech Production," *Working Papers in Phonetics* **22**, UCLA.

Papcun, G., S. Krashen and D. Terbeek (1972) "The Left Hemisphere is Specialized for Speech, Language *and* Something Else," *Working Papers in Phonetics*, **21**, UCLA.

Who Needs You? Educational Film (Author and Co-producer) Distributed by Aims Films, Hollywood, CA.

SELECTED LEGAL CASES

Joshua Durham v. Mark Nooth (Appearance for Durham) Malheur County, Idaho Case No. 13-04-216-P 11/4/14

Superior Performers, Inc. d/b/a National Agents Alliance v. Shawn L. Meike, Marc J. Meade, Bryant Stone, Frank Eufemia, Jaime Eufemia and Michael Sizer United States District Court in the Middle District of North Carolina, Civil Action No. 1:13CV1149 Deposition July 18, 2014, for Superior Performers

Commonwealth of Massachusetts v. Chiras Declaration to Auburn Police Department Detective Daniel Lamoreaux 416 Oxford Street, North Auburn, Massachusetts 01501 11 May 2012

UNITED STATES v.1ST LT PATRICK T. BURKE (Appearance for Burke) 9TH BOMB SQUADRON (ACC) DYESS AFB, TX COURT-MARTIAL Misc. Dkt. No. 2011-08

Daniel, Reba v. Kelley Oil Corporation and David Kelley (Appearance for Kelley) May 17, 1994 Court 127 Harris, County, TX Case # 199422682-7

Rodney King v. CITY OF LOS ANGELES et al. (Appearance for King) Los Angeles Federal Court March, 1994

Gonzales, Jose v. Trinity Marine Group, Inc. Baton Rouge, LA July, 1997

Queen v. Kashani-Malaki

Queensland, Australia [2010] QCA 222 FILE NO/S: CA No 182 of 2009 SC No 1258 of 2008