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Areas of Research: RF Microelectromechanical Systems

A. PROFESSIONAL PREPARATION

University of California at Berkeley	Electrical Engineering and Computer Science, B.S., 1988
University of California at Berkeley	Electrical Engineering and Computer Science, M.S., 1991
University of California at Berkeley	Electrical Engineering and Computer Science, Ph.D., 1994

B. APPOINTMENTS

Director, Berkeley Sensor & Actuator Center	2006-present
Professor, Dept. of EECS, University of California at Berkeley	2006-present
Professor, EECS Department, University of Michigan	2006
MEMS Program Manager, DARPA (MEMS, micro power generation)	2002-2006
Associate Professor, EECS Department, University of Michigan	2001-2006
Assistant Professor, EECS Department, University of Michigan	1995-2001
Vice President and Chief Technology Officer, Discera, Inc.	2001-2002

C. SYNERGISTIC ACTIVITIES

- Presently serving as the American Regional Program Chair of the 14th International Conference on Solid-State Sensors and Actuators (Transducers 2007).
- Founded the start-up company Discera, Inc., which is the first company to commercialize vibrating RF MEMS technology, paving the way for a bright future market in this technology area, and breaking down barriers (e.g., from investors) for future growth in this area. The success of Discera is perhaps best indicated by the number of ”copycats” now sprouting up to cover this market (e.g., Si Times, Silicon Clocks, and others). Discera is presently sampling timing products to customers and will be the first company to be in high volume production in the second quarter of 2006.
- From 5/02 to 12/31/05, served as the MEMS Program Manager in the Microsystems Technology Office (MTO) of the Defense Advanced Research Projects Agency (DARPA), where I generated 7 programs and augmented 3, for a total of 10 programs, which included Micro Electro Mechanical Systems (MEMS), Micro-Scale Power Generation (MPG), Chip-Scale Atomic Clock (CSAC), MEMS Exchange (MX), Harsh Environment Robust Micromechanical Technology (HERMIT), Micro Gas Analyzers (MGA), Radio Isotope Micropower Sources (RIMS), RF MEMS Improvement Program (RFMIP), Navigation-Grade Integrated Microgyroscopes (NGIMG), and Micro Cryogenic Coolers (MCC). The total amount of funding I generated over my 3.5 years at DARPA exceeds $356 million, to last through FY09.
- Served on the technical program committees of numerous conferences, including the IEEE Int. MEMS Conference, the Transducers conferences, the Hilton Head MEMS Workshop, the IEEE Int. Electron Devices Meeting (IEDM), the IEEE MTT Int. Microwave Symposium, and the IEEE Int. Solid-State Circuits Conference, where he promoted MEMS for frequency generation and control. The MEMS conferences now all feature sessions focused on vibrating RF MEMS, and the IEDM’s MEMS sessions have a strong vibrating RF MEMS vibe that focuses on frequency generation and control. Having recently joined the technical program committee of the IEEE Int. Frequency Control Symposium, Prof. Nguyen is now actively attempting to expand the MEMS frequency control content at the premiere meeting on timing and frequency control.
- Has given 95 invited papers at international conferences (12 plenary/keynotes and 6 short courses).

D. RELATED PUBLICATIONS

1. J. R. Clark, W.-T. Hsu, M. A. Abdelmoneum, and C. T.-C. Nguyen, "High-Q UHF micromechanical radial-contour mode disk resonators," IEEE/ASME J. Microelectromech. Syst., vol. 14, no. 6, pp. 1298-1310, Dec. 2005.
2. Y.-W. Lin, S.-S. Li, Z. Ren, and C. T.-C. Nguyen, "Third-order intermodulation distortion in capacitively-driven VHF micromechanical resonators," Proceedings, IEEE Int. Ultrasonics Symposium, Sept. 18-21, 2005, 1592-1595.
3. Y.-W. Lin, S.-S. Li, Z. Ren, and C. T.-C. Nguyen, "Vibrating micromechanical resonators with solid dielectric capacitive-transducer 'gaps'," Proceedings, Joint IEEE Int. Freq. Control/Precision Time & Time Interval Symp., Vancouver, Canada, Aug. 29-31, 2005, pp. 128-134.
4. C. T.-C. Nguyen and J. Kitching, "Towards chip-scale atomic clocks," Digest of Technical Papers, 2005 IEEE Int. Solid-State Circuits Conference, San Francisco, California, Feb. 6-9, 2005, pp. 84-85.
5. Y.-W. Lin, S. Lee, S.-S. Li, Y. Xie, Z. Ren, C. T.-C. Nguyen, "Series-resonant VHF micromechanical resonator reference oscillators," IEEE J. Solid-State Circuits, vol. 39, no. 12, pp. 2477-2491, Dec. 2004.
6. J. Wang, Z. Ren, and C. T.-C. Nguyen, "1.156-GHz self-aligned vibrating micromechanical disk resonator," IEEE Trans. Ultrason., Ferroelect., Freq. Contr., vol. 51, no. 12, pp. 1607-1628, Dec. 2004.
7. C. T.-C. Nguyen, "Vibrating RF MEMS for next generation wireless applications (invited)," Proceedings, 2004 IEEE Custom Integrated Circuits Conf., Orlando, Florida, Oct. 3-6, 2004, pp. 257-264.
8. S. Lee and C. T.-C. Nguyen, "Mechanically-coupled micromechanical arrays for improved phase noise," Proceedings, IEEE Int. Ultrasonics, Ferroelectrics, and Frequency Control 50th Anniv. Joint Conf., Montreal, Canada, Aug. 24-27, 2004, pp. 280-286.
9. Y. Xie, S.-S. Li, Y.-W. Lin, Z. Ren, and C. T.-C. Nguyen, "UHF micromechanical extensional wine-glass mode ring resonators" Tech. Digest, 2003 IEEE International Electron Devices Meeting, Washington, DC, Dec. 8-10, 2003, pp. 953-956.
10. A.-C. Wong, H. Ding, and C. T.-C. Nguyen, "Micromechanical mixer+filters," Tech. Dig., IEEE Int. Electron Devices Mtg., San Francisco, CA, Dec. 6-9, 1998, pp. 471-474.

E. RELATED PATENTS

1. M. A. Abdelmoneum and C. T.-C. Nguyen, "Micromechanical resonator device and method of making a micromechanical device," U.S. Patent No. 6,985,051 B2, issued Jan. 10, 2006.
2. W.-T. Hsu and C. T.-C. Nguyen, "Mechanical resonator device having phenomena-dependent electrical stiffness," U.S. Patent No. 6,958,566, issued Oct. 25, 2005.
3. J. R. Clark and C. T.-C. Nguyen, "Micromechanical resonator device and micromechanical device utilizing same," U.S. Patent No. 6,856,217, issued Feb. 15, 2005.
4. C. T.-C. Nguyen, "Method and subsystem for processing signals utilizing a plurality of vibrating micromechanical devices," U.S. Patent No. 6,917,138, issued July 12, 2005.
5. W.-T. Hsu, J. R. Clark, and C. T.-C. Nguyen, "Method for making micromechanical structures having at least one lateral, small gap therebetween and micromechanical device produced thereby," U.S. Patent No. 6,846,691, issued January 25, 2005.
6. C. T.-C. Nguyen, "Method and apparatus for upconverting and filtering an information signal utilizing a vibrating micromechanical device," U.S. Patent No. 6,424,074, issued July 23, 2002.
7. C. T.-C. Nguyen, V. Gutnik, and R. T. Howe, "Mixing, modulation, and demodulation via mechanical resonators," U.S. Patent No. 5,839,062, issued November 17, 1998.
8. C. T.-C. Nguyen, "Method and apparatus for selecting at least one desired channel utilizing a bank of vibrating micromehanical apparatus," U.S. Patent No. 6,566,786, issued May 20, 2003.
9. C. T.-C. Nguyen, L. Lin, R. T. Howe, and A. P. Pisano, "Microelectromechanical signal processors," U.S. Patent No. 5,537,083, issued July 16, 1996.