

CURRICULUM VITAE

Mina Rais-Zadeh

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I. EARNED DEGREES

- Ph.D., Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA, 2008
- M.S., Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA, 2005
- B.S., Electrical Engineering, *Sharif University of Technology*, Tehran, Iran, 2002

II. EMPLOYMENT

- January 2009 – present: Assistant Professor, Department of Electrical Engineering and Computer Science, *University of Michigan*, Ann Arbor, MI
- August 2008 – January 2009: Post-Doctoral Fellow, School of Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA
- January 2003 – August 2008: Graduate Research Assistant, Integrated MEMS Laboratory, School of Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA

III. HONORS AND AWARDS

- IEEE EDS Early Career Award, 2011
- NSF CAREER Award, 2011
- Member of RF & AMS Technology Working Group of ITRS, 2011–now
- IEEE IMS Best Student Paper Award (Finalist), 2011
- IEEE SiRF Best Student Paper Award (Finalist), 2007
- Ranked 9th in National University Entrance Examination for Undergraduate Studies (among 400,000 participants), 1998
- National Organization for Development of Exceptional Talents student, 1991–1997

IV. PUBLICATIONS

I. JOURNAL PUBLICATIONS

1. Y. Shim, Z. Wu, and M. Rais-Zadeh, “A multi-metal surface micromachining process for tunable RF MEMS passives,” *IEEE Journal of Microelectromechanical Systems (JMEMS)*, submitted, 2011.
2. Y. Shim, Z. Wu, and M. Rais-Zadeh, “A high-performance continuously tunable MEMS bandpass filter at 1 GHz,” *IEEE Transaction on Microwave Theory and Technique (TMTT)*, submitted, 2011.
3. V. A. Thakar, W. Pan, F. Ayazi, and M. Rais-Zadeh, “Acoustically coupled thickness-mode AlN-on-Si bandpass filters, Part II: simulation and analysis,” *IEEE Trans. Ultrasonics, Ferroelectrics and Frequency Control*, submitted, 2011.
4. W. Pan, V. A. Thakar, M. Rais-Zadeh, and F. Ayazi, “Acoustically coupled thickness-mode AlN-on-Si bandpass filters, Part I: principle and devices,” *IEEE Trans. Ultrasonics, Ferroelectrics and Frequency Control*, submitted, 2011.
5. Z. Wu, Y. Shim, and M. Rais-Zadeh “Miniaturized UWB filters integrated with tunable notch filters using a silicon-based integrated passive device technology,” *IEEE Trans. on Microwave Theory and Techniques (TMTT)*, pp. 1–10, 2012.

6. M. Rais-Zadeh, H. M. Lavasani, and F. Ayazi, "An integrated 800MHz coupled-resonator tunable bandpass filter in silver with a constant bandwidth," *IEEE Journal of Microelectromechanical Systems (JMEMS)*, vol. 18, issue 3, pp. 942–949, Aug. 2009.
7. M. Rais-Zadeh, A. Kapoor, H. M. Lavasani, and F. Ayazi, "Fully integrated low-loss bandpass filters for wireless applications," *Journal of Micromechanics and Microengineering (JMM)*, vol. 9, pp. 1–8, July 2009.
8. M. Rais-Zadeh, J. Laskar, and F. Ayazi, "High performance inductors on CMOS-grade trenched silicon substrate," *IEEE Trans. Components and Packaging Technologies*, vol. 31, no. 1, pp. 126–134, March 2008.
9. M. Rais-Zadeh, P. A. Kohl, and F. Ayazi, "MEMS switched tunable inductor," *IEEE Journal of Microelectromechanical Systems*, vol. 17, no. 1, pp. 78–84, Feb. 2008.
10. M. Rais-Zadeh and F. Ayazi, "Characterization of high- Q spiral inductors on thick insulator-on-silicon," *Journal of Micromechanics and Microengineering*, vol. 15, pp. 2105–2112, Sept. 2005.

2. CONFERENCE PROCEEDINGS

1. V. A. Thakar, W. Pan, F. Ayazi, and M. Rais-Zadeh, "Acoustically coupled AlN-on-Si bandpass filters with high- Q notches within the passband," *IEEE International Frequency Control Symposium*, submitted, 2012.
2. V. Thakar, Z. Wu, and M. Rais-Zadeh, "A high ON/OFF ratio MEMS capacitive switch with applications in solar energy harvesting," *Solid-State Sensors, Actuators and Microsystems Workshop*, Hilton Head, SC, submitted, 2012.
3. V. J. Gokhale and M. Rais-Zadeh, "Resonant uncooled IR sensors using Gallium Nitride micromechanical resonators and Silicon Nitride Absorbers," *Solid-State Sensors, Actuators and Microsystems Workshop*, Hilton Head, SC, submitted, 2012.
4. Y. Sui, V. Gokhale, O. A. Shenderova, G.E. McGuire, and M. Rais-Zadeh, "A thin film infrared absorber using CNT/nanodiamond nanocomposite," *MRS, 2012*, accepted.
5. M. Rais-Zadeh, V. J. Gokhale, and S. Yu, "Novel uncooled detector based on gallium nitride micromechanical resonators," *Proceedings of SPIE: Infrared Technology and Applications*, accepted, Baltimore, MD, 2012.
6. M. Rais-Zadeh, "Gallium nitride micromechanical resonators for IR detection," *Proceedings of SPIE: Micro- and Nanotechnology Sensors, Systems, and Applications*, *invited*, Baltimore, MD, 2012.
7. Y. Shim, J. Ruan, Z. Wu, and M. Rais-Zadeh, "An integrated RF MEMS tunable filter," *IEEE International Conference on Microelectromechanical Systems (MEMS'12)*, Paris, France, 2012.
8. O. A. Shenderova, S. Hens, A. V. Sumant, S. Yu, V. J. Gokhale, M. Rais-Zadeh, and G.E. McGuire, "Detonation nanodiamond in DMSO as seeding slurries for CVD diamond," *IV International Conference on Surfaces, Materials and Vacuum*, Puerto Vallarta, Mexico, Sept. 2011.
9. A. Ansari, V. J. Gokhale, V. A. Thakar, J. Roberts, and M. Rais-Zadeh, "Gallium nitride-on-silicon micromechanical overtone resonators and filters," *IEEE Electron Device Meeting (IEDM'11)*, Baltimore, MD, 2011, pp. 485–488.
10. Z. Wu, Y. Shim, and M. Rais-Zadeh, "Switchable wide tuning range bandstop filters for frequency-agile radios," *IEEE Electron Device Meeting (IEDM'11)*, Baltimore, MD, 2011, pp. 493–496.
11. V. J. Gokhale, J. Roberts, and M. Rais-Zadeh, "Bulk-mode gallium nitride resonators and filters," *International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers'11)*, Beijing, China, June 2011, pp. 926–929.
12. Z. Wu, Y. Shim, and M. Rais-Zadeh, "Miniaturized UWB bandpass filters integrated with notch filters using a Si-based integrated passive device technology," *IEEE International Microwave Symposium (IMS'11)*, *Best Student Paper Award (finalist)*, Baltimore, MD, June 2011, pp. 1–4.

13. Y. Shim, Z. Wu, and M. Rais-Zadeh, "A high-performance temperature-stable continuously tuned MEMS capacitor," *IEEE International Conference on Microelectromechanical Systems (MEMS'11)*, Cancun, Mexico, Jan. 2011, pp. 752–755.
14. M. Rais-Zadeh, "Design and fabrication considerations in developing high-Q MEMS capacitors and inductors," *IEEE 11th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF'11)*, Phoenix, AZ, Jan. 2011, pp. 161–164, *invited*.
15. V. J. Gokhale, Y. Shim, and M. Rais-Zadeh, "Observation of the acoustoelectric effect in gallium nitride micromechanical bulk acoustic filters," *IEEE International Frequency Control Symposium*, Newport Beach, CA, June 2010, pp. 524–529.
16. V. J. Gokhale, Y. Shim, V. A. Thakar, and M. Rais-Zadeh, " Q amplification in gallium nitride thickness mode filters using acoustoelectric effect," *Solid-State Sensors, Actuators and Microsystems Workshop*, Hilton Head, SC, June 2010, pp. 1–4.
17. Y. Shim, R. Tabrizian, F. Ayazi, and M. Rais-Zadeh, "Low-loss MEMS filters with improved out-of-band rejection by exploiting inductive parasitics," *IEEE International Electron Device Meeting (IEDM'09)*, Baltimore, MD, Dec. 2009, pp. 1–4.
18. R. Tabrizian, M. Rais-Zadeh, and F. Ayazi, "Effect of phonon interactions on limiting the fQ product of micromechanical resonators," *Solid-State Sensors, Actuators and Microsystems (Transducers'09)*, Denver, CO, June 2009, pp. 2131–2134.
19. M. Rais-Zadeh and F. Ayazi, "Small-bandwidth integrated tunable bandpass filters for GSM applications," *IEEE International Conference on Microelectromechanical Systems (MEMS'08)*, Tucson, AZ, Jan. 2008, pp. 1032–1035.
20. M. Rais-Zadeh, A. K. Samarao, P. Monajemi, and F. Ayazi, "Low-voltage large-value tunable capacitors using self-aligned HARPSS," *IEEE International Conference on Microelectromechanical Systems (MEMS'08)*, Tucson, AZ, Jan. 2008, pp. 319–322.
21. M. Rais-Zadeh, H. M. Lavasani, and F. Ayazi, "CMOS-compatible encapsulated silver bandpass filters," *IEEE Microwave Symposium (IMS'07)*, Honolulu, HI, June 2007, pp. 1301–1304.
22. M. Rais-Zadeh, P. A. Kohl, and F. Ayazi, "A packaged micromachined switched tunable inductor," *IEEE International Conference on Microelectromechanical Systems (MEMS'07)*, Kobe, Japan, Jan. 2007, pp. 799–802.
23. M. Rais-Zadeh and F. Ayazi, "High-Q tunable silver capacitors for RFIC's," *IEEE Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF'07), Best Student Paper Award (finalist)*, Long Beach, CA, Jan. 2007, pp. 169–172.
24. M. Rais-Zadeh, P. A. Kohl, and F. Ayazi, "High- Q micromachined silver passives and filters," *IEEE International Electron Device Meeting (IEDM'06)*, San Francisco, CA, Dec. 2006, pp. 727–730.
25. M. Raieszadeh, P. Monajemi, S. W. Yoon, J. Laskar, and F. Ayazi, "High- Q integrated inductors on trench silicon islands," *IEEE International Conference on Microelectromechanical Systems (MEMS '05)*, Miami, FL, Jan. 2005, pp. 199–202.

3. LETTERS

1. V. Gokhale, Y. Sui, O. A. Sherendova, G. E. McGuire, and M. Rais-Zadeh, "A Carbon nanotube based nanocomposite with high infrared absorption," *Applied Physics Letter*, submitted, 2012.

4. PATENTS

Issued Patents

1. F. Ayazi, M. Raieszadeh, and P. Monajemi, "Microelectromechanical systems structures and self-aligned HARPSS fabrication processes for producing same," US Patent Issued, 2011.
2. F. Ayazi, M. Raieszadeh, and P. A. Kohl, "Micro-electromechanical voltage tunable capacitors and filter devices" US Patent 7,933,112, Published April 2011.
3. F. Ayazi and M. Raieszadeh, "Micro-electromechanical Switched Tunable Inductor", US Patent 7,847,669, Published Dec. 2010.

Pending Patents

1. F. Ayazi and M. Raieszadeh, "Low-loss substrate for high quality components," US Patent pending, Application No. 11/168066, Filed 6/28/2005.

Disclosures

1. M. Raieszadeh, Z. Wu, A. Peczalski, and V. A. Thakar, "Temperature compensated micromechanical resonators," Invention Disclosure Filed 10/31/2011.
2. M. Raieszadeh and Y. Shim, "Reconfigurable RF circuits using hybrid MEMS/phase change switches," Invention Disclosure Filed 11/01/2011.
3. M. Raieszadeh and Y. Shim, "RF Filters with wide-range continuous tuning," Invention Disclosure Filed 8/19/2011.
4. M. Raieszadeh and V. J. Gokhale, "An un-cooled resonance pyro/piezo electric infrared sensor array," Invention Disclosure Filed 8/17/2009.

5. THESES

1. M. Raieszadeh, "Wafer-level encapsulated high-performance MEMS tunable passives and bandpass filters," *Doctoral thesis*, Department of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, 2008.
2. M. Raieszadeh, "High- Q integrated inductors on trench Si islands," *Master thesis*, Department of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, 2005.

V. PRESENTATIONS

1. INTERNATIONAL CONFERENCES

1. M. Rais-Zadeh, V. J. Gokhale, and S. Yu, "Novel uncooled detector based on Gallium Nitride micromechanical resonators," *Proceedings of SPIE: Infrared Technology and Applications*, Baltimore, MD, 2012.
2. "Design and fabrication considerations in developing high- Q MEMS capacitors and inductors," *IEEE Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF'11)*, Phoenix, AZ, Jan. 2011.
3. M. Rais-Zadeh, H. M. Lavasani, and F. Ayazi, "CMOS-compatible encapsulated silver bandpass filters," *IEEE Microwave Symposium (IMS'07)*, Honolulu, HI, June 2007.
4. "High- Q tunable silver capacitors for RFIC's," *IEEE Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF'07)*, Long Beach, CA.
5. "High- Q micromachined silver passives and filters," presented in *IEEE International Electron Device Meeting (IEDM'06)*, San Francisco, CA.
6. "High- Q integrated inductors on trench Si islands," presented in *IEEE International Conference on Microelectromechanical Systems (MEMS'05)*, Miami, FL.

2. INVITED TALKS

1. "Gallium nitride micromechanical resonators for IR detection," SPIE (2012 Micro- and Nanotechnology Sensors, Systems, and Applications Conference), to be held in Baltimore, MD, 23–27 April, 2012.
2. "Miniaturized Tunable RF MEMS Filters using a Silicon-Based Integrated Passive Device Technology," *UM/SNU Workshop*, Seoul National University, Seoul, South Korea, June 2011.
3. "Reconfigurable MEMS filters for low-power multi-band radios," *UM/IEMN Workshop*, IEMN, France, May 2011.
4. "Characterization and Modeling of RF MEMS passive and Filters," *2011 NNIN/C Michigan Symposium*, Ann Arbor, MI, April 2011.
5. "Design and fabrication considerations in developing high- Q MEMS capacitors and inductors," *IEEE Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF'11)*, Phoenix, AZ, Jan. 2011.
6. "MEMS resonators and filters for communication and sensing applications," University of British

Colombia, May 2010, Vancouver, BC, Canada.

7. “High- Q micro-resonators and filters and their application in communication and sensing systems,” Army Research Laboratory, April 2010, Baltimore, MD.
8. “Resonant micro/nano electromechanical devices,” *IEEE Nanotechnology Conference*, Eagle Crest Conference Center, Nov. 2009, Ypsilanti, MI.
9. “High- Q RF passives on CMOS-compatible trenched-silicon-islands” presented in *Industry Advisory Board Meeting*, 2007, Atlanta, GA.

VI. RESEARCH AWARDS

1. CURRENT

1. Title: Package of Silica for Timing & Inertial Measurement (PASTIME), Organization: **DARPA MTO**, Investigators: Khalil Najafi (PI), Mina Rais-Zadeh (co-PI), Grant Period: 06/1/2011 – 05/31/2015.
2. Title: Packaging Process Development of Integrated Filter for Tactical Radios, Organization: **Harris Corporation**, Investigator: Mina Rais-Zadeh (PI), Grant Period: 09/1/2011 – 08/30/2012.
3. Title: MEMS Reconfigurable Filters for Multi-Band Low-Power Radios, Organization: **NSF CAREER**, Investigator: Mina Rais-Zadeh (PI), Grant Period: 02/1/2011 – 01/31/2016.
4. Title: IR Detector Arrays Using Q -amplified MEMS Resonators, Organization: **ARL**, Micro Autonomous Science and Technology Center (MAST), Investigators: Mina Rais-Zadeh (PI), Kamal Sarabandi (Center Director), Grant Period: 10/1/2010 – 10/30/2012.
5. Title: MEMS Reconfigurable Subwavelength Metallic Slits for Broadband Terahertz Modulation, Organization: **NSF**, Investigators: Mona Jarrahi (PI), Mina Rais-Zadeh (Co-PI), Grant Period: 09/1/2010 – 08/31/2013.
6. Title: Ultra-Sensitive Resonant GaN Infrared Sensors using CNT-Polymer Nanocomposites, Organization: **NSF**, Investigators: Mina Rais-Zadeh (PI), P. C. Ku (Co-PI), Grant Period: 5/15/2010 – 05/14/2013.

2. PREVIOUS

1. Title: Wide Tuning Range Integrated Filter for Tactical Radios, Organization: **Harris Corporation**, Investigator: Mina Rais-Zadeh (PI), Grant Period: 04/1/2010 – 03/31/2011.
2. Phase I Research Commercialization Grant from **Georgia Research Alliance** for RadioMEMS Incorporate, Investigators: Farrokh Ayazi and Mina Rais-Zadeh, Grant Period: 2007–2008.

VII. SERVICES AND ACTIVITIES

- Member of the RF & AMS Technology Working Group of International Technology Roadmap for Semiconductors (ITRS), 2012–now
- IEEE EDS GOLD committee member, 2012–present
- NSF Panelist, 2010–present
- IEEE Southeast Michigan Chapter, **EDS vice chair**, 2009–present
- NSF GAANN Fellowship committee, 2009–present
- Graduate Faculty Advisor, University of Michigan, 2011–present
- Co-founder of RadioMEMS, an Atlanta-Based Start-up Company with Dr. Farrokh Ayazi
- Undergraduate Faculty Advisor, University of Michigan, 2009–2011
- IEEE Women in Engineering member, 2005–present
- IEEE member, Electron Device Society, 2003–present
- IEEE member, Microwave Theory and Techniques Society, 2010–present
- Reviewer for the IEEE Journal of Microelectromechanical Systems, Journal of Micromechanics and Microengineering, IEEE Transaction on Electron Devices, IEEE Transaction of Microwave Theory and Techniques, IEEE Transaction on Nanotechnology, Sensors and Actuators A: Physical, IEEE Design and Test of Computers, IEEE Transaction on Industrial Electronics, IEEE Transaction on Ultrasonics, Ferroelectrics, and Frequency Control

- Technical Program Committee/Session Chair: IEEE IEDM conference (2011-2012), IEEE Sensors conference (2011-2012), Hilton Head Workshop (2012)

VIII. ACADEMIC TEACHING

- EECS 514: Advanced MEMS-Device and Technologies
- EECS 515: Integrated Microsystems
- EECS 311: Electronic Circuits
- EECS 598: RF MEMS

IX. STUDENTS

1. PH.D. STUDENTS

- Yonghyun Shim, B.S. in Electrical Engineering, Seoul National University; M.S. in Electrical Engineering and Computer Science, University of Michigan, 2009
- Vikrant J. Gokhale, B. Tech in Electronics and Instrumentation Engineering at Vellore Institute of Technology, Vellore, TN, India
- Zhengzheng Wu, M. Eng. in Microelectronics and Solid State Electronics, Chinese Academy of Sciences, Shanghai, China
- Vikram Thakar, B.S. in Mechanical Engineering, University of Pune, India
- Azadeh Ansari, B.S. in Electrical Engineering, Sharif University of Technology, Iran

2. M.S. STUDENTS

- Adam Peczkalski, B.S. in Electrical Engineering, University of Wisconsin

3. UNDERGRADUATE STUDENTS

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4. HIGH SCHOOL SUMMER INTERNS

- Niarra Coleman, Ypsilanti High School, Summer 2011
- Albert Washington, Ypsilanti High School, Summer 2011

5. PAST MEMBERS

- Yu Sui, 2011
- Anchal Agarwal, 2011
- Lisa Anne Hendricks, NNIN Undergraduate student, Summer 2011
- Jeff Ruan, M.S. in Electrical Engineering, 2010–2011
- Natalie Swider, NNIN Undergraduate student, Summer 2010

X. STUDENT AWARDS

- Best Poster Award, Engineering Graduate Symposium, MEMS/Mechatronics Section, V. J. Gokhale and M. Rais-Zadeh, 2011
- IEEE IMS Best Student Paper Award (Finalist), Z. Wu, Y. Shim and M. Rais-Zadeh, 2011
- Best Poster Award, WIMS IAB Meeting, Y. Shim and M. Rais-Zadeh, 2011
- NSF GAANN Fellowship, A. Peczkalski, 2011
- Rackham International Student Fellowship, Z. Wu, 2010