



## SUMMARY

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### EMBEDDED NETWORKED SYSTEMS WITH AN EMPHASIS IN HEALTH INFORMATICS.

Architectural support for mobile embedded systems for tracking and biometric applications; participatory design techniques for lightweight medical system development; statistical power analysis techniques to detect the physical tampering of integrated circuits; cost benefit analysis techniques to analyze mobile medical technologies.

## EDUCATION

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| 2004 – 2009 | UNIVERSITY OF CALIFORNIA, LOS ANGELES.<br>Ph.D., Computer Science.<br>Dissertation Title: <i>Data Driven and Optimization Techniques for Mobile Health Systems.</i> |
| 2002 – 2004 | GEORGIA INSTITUTE OF TECHNOLOGY.<br>M.Sc., Computer Science.<br>Master's Project Title: <i>Message Ferrying Architecture and Design.</i>                            |
| 1998 – 2002 | UNIVERSITY OF NORTH CAROLINA, WILMINGTON.<br>B.Sc., Computer Science (Magna Cum Laude).   |

## PROFESSIONAL EXPERIENCE

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| 2009-PRESENT | JOHNS HOPKINS UNIVERSITY / APPLIED PHYSICS LAB.<br>Systems Engineer / Researcher.<br>Applied Information Sciences Dept (Laurel, MD). <ul style="list-style-type: none"><li>Develop, test, and analyze techniques and algorithms on embedded platforms for biometric and mobile applications.</li></ul>                                     |
| 2007         | ISTITUTO SUPERIORE MARIO BOELLA.<br>Visiting Researcher.<br>Radio Technologies for Multimedia Applications Laboratory (Turin, Italy). <ul style="list-style-type: none"><li>Conducted a measurement study of body area networks that collected the RSSI, delay, and packet loss.</li></ul>   |
| 2006         | JOHNS HOPKINS UNIVERSITY / APPLIED PHYSICS LAB.<br>Hardware Lead / Visiting Researcher.<br>National Security Technology Dept (Laurel, MD). <ul style="list-style-type: none"><li>Managed three people to develop an electronic triage tag system with medical sensors (ECG, blood cuff, and pulse-ox) for embedded devices.</li></ul>      |
| 2005         | INTEL.<br>Wireless MESH Networking Lab Intern.<br>Communications Technology Group / CTG (Hillsboro, OR). <ul style="list-style-type: none"><li>Configured, tested, &amp; programmed a 802.11s mesh network transmitting VoIP data.</li></ul>   |
| 2004         | LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL).<br>University Collaborative Researcher.<br>Computing Applications and Research Dept (Livermore, CA). <ul style="list-style-type: none"><li>Programmed an Ultra-Wideband Wireless Token Ring simulation to analyze the effect of mobility &amp; the number of nodes on throughput.</li></ul> |

- 2003, 2002 JET PROPULSION LABORATORY (JPL) / NASA.  
Simulation and Verification Researcher/Intern.  
Flight System Avionics Section 345 (Pasadena, CA).
- Developed a visualization to convey spatial relationships, to scale with different applications, to promote efficient searching, and to provide remote access for the NASA Formation Flying Simulation.
- 2001 TALKINGNETS, INC.  
Information Technology Intern.  
Start-up Company acquired by DSL.NET in 2003 (Wilmington, NC).
- Assisted with the development, documentation, & testing of Internet Protocol phones.
- 2000 JET PROPULSION LABORATORY (JPL) / NASA.  
Radiation Test Lab Technician Intern.  
Quality Assurance Flight Systems Section 512 (Pasadena, CA).
- Tested electronic parts for performance characteristics after radiation exposure and maintained the Online JPL Radiation Effects Database.

## SKILLS AND CAPABILITIES

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LANGUAGES	C, Java, NesC , Perl.
OPERATING SYSTEMS	Linux, Windows, TinyOS, SOS.
EMBEDDED HARDWARE	Mica2, MicaZ, TelosB.

## MAJOR PUBLICATIONS

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\*PUBLISHED OVER 20 PEER REVIEWED PUBLICATIONS (SUBSET LISTED BELOW).

- IEEE Trans. TITB [P8] A TELEHEALTH ARCHITECTURE FOR NETWORKED EMBEDDED SYSTEMS: A CASE STUDY IN IN-VIVO HEALTH MONITORING.  
F. Dabiri, **T. Massey**, H. Noshadi, C. Lin, R. Tan, J. Schmidt, and M. Sarrafzadeh.  
*IEEE Trans. Information Technology in Biomedicine*. Vol 13, No. 3. May 2009.
- IEEE Trans. TCAD [P7] SOFT ERROR-AWARE POWER OPTIMIZATION USING GATE SIZING.  
F. Dabiri, A. Nahapetian, **T. Massey**, M. Potkonjak, and M. Sarrafzadeh.  
*IEEE Trans. Computer Aided Design*. Vol 27. No. 10. Oct. 2008.
- IEEE Trans. TBCAS [P6] THE ADVANCED HEALTH AND DISASTER AID NETWORK: A LIGHT-WEIGHT WIRELESS MEDICAL SYSTEM FOR TRIAGE.  
T. Gao, **T. Massey**, L. Selavo, D. Crawford, B. Chen, K. Lorincz, V. Shnayder, L. Hauenstein, F. Dabiri, J. Jeng, A. Channugam, D. White, M. Sarrafzadeh, and M. Welsh.  
*IEEE Trans. Biomedical Circuits and Systems*, Vol. 1, No. 3, Sept. 2007.
- COMPUTER ENG [P5] LIGHT-WEIGHT EMBEDDED SYSTEMS.  
F. Dabiri, R. Jafari, **T. Massey**, A. Nahapetian, and M. Sarrafzadeh.  
[Book Chapter] *In Digital Design and Fabrication (Computer Engineering Handbook)*.  
Edited by Vojin Oklobdzija, Taylor & Francis/CRC Press, 2007.
- DAC 2009 [P4] HARDWARE TROJAN HORSE DETECTION USING GATE-LEVEL CHARACTERIZATION  
M. Potkonjak, A. Nahapetian, M. Nelson, **T. Massey**.

*Design Automation Conference (DAC 2008). San Francisco, California. July 2009. [ACCEPTANCE RATE: 21.7%]*

- DAC 2008 [P3] INPUT VECTOR CONTROL FOR POST-SILICON LEAKAGE CURRENT MINIMIZATION IN THE PRESENCE OF MANUFACTURING VARIABILITY. Y. Alkabani, **T. Massey**, F. Koushanfar, M. Potkonjak. *Design Automation Conference (DAC 2008). Anaheim, California. June 2008. [ACCEPTANCE RATE: 23%]*
- AMIA 2006 [P2] THE DESIGN OF A DECENTRALIZED ELECTRONIC TRIAGE SYSTEM. **T. Massey**, T.Gao, M. Welsh, J. Sharp, and M. Sarrafzadah. *American Medical Informatics Association (AMIA 2006). Washington, DC, Nov. 2006.*
- ISLPED 2006 [P1] LOW POWER LIGHT-WEIGHT EMBEDDED SYSTEMS. M. Sarrafzadeh, F. Dabiri, R. Jafari, **T. Massey**, and A. Nahapetian. *International Symposium on Low Power Electronics and Design (ISLPED 2006). Tegernsee, Germany, Oct. 2006.*

## PATENTS

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- 2007 [P1] DYNAMIC LIGHTWEIGHT ON-BODY ENCRYPTION ALGORITHM. M. Sarrafzadeh, E. Collins, J. Rindenau, N. Terrafranca, **T. Massey**. *Provisionary Patent. Jan. 2007.*

## INVITED TALKS / TUTORIALS

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- 2009 [T6] DATA DRIVEN AND OPTIMIZATION TECHNIQUES FOR MOBILE HEALTH SYSTEMS. *Presentation at Massachusetts Institute of Technology, Carnegie Mellon University, Columbia University, University of Southern California, Northwestern University, University of Michigan, Vanderbilt University, Ohio State University, University of California Santa Barbara, University of California Riverside, Boston University, Florida International University.*
- 2007 [T5] PEOPLE NETWORKS: RECONFIGURABLE EMBEDDED SYSTEMS AND OPPORTUNISTIC BODY AREA ROUTING. *Presentation at Rochester Institute of Technology.*
- 2007 [T4] LIGHTWEIGHT RECONFIGURABLE MEDICAL SYSTEMS. *Presentation at Istituto Superior de Mario Boella (ISMB).*
- 2007 [T3] RELIABILITY IN LIGHT-WEIGHT MEDICAL MONITORING PLATFORMS. *[Tutorial] Presentation at the 4th International Workshop on Body Sensor Networks (BSN 2007).*
- 2003 [T2] REAL-TIME VISUALIZATION OF A HIERARCHICAL DISTRIBUTED RECONFIGURABLE ARCHITECTURE. *Presentation at Jet Propulsion Laboratory (JPL) / NASA Center.*
- 2002 [T1] DISTRIBUTED ARCHITECTURE FOR FORMATION FLYING. *Presentation at Jet Propulsion Laboratory (JPL) / NASA Center*

## HONORS

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- 2008 University of California Office of the President Dissertation Fellowship.
- 2008 Ford Dissertation Fellowship.
- 2008 American Association of University Women Alternate.
- 2007, 2008 Google Anita Borg Memorial Scholar, Google Anita Borg Memorial Finalist.
- 2007 Intel PhD Fellowship.
- 2002, 2005 GEM Masters & PhD Fellowship.

2004	NASA Harriet G. Jenkins Pre-doctoral Fellowship.
2002, 2003	National Science Foundation Fellowship, Honorable Mentioned.
2003	Georgia Tech Women's Forum Scholarship.
2003	Verizon Scholarship.
2001	Outstanding Student of the Year for the College of Arts & Sciences.
1998	Dr. L.W. Upperman Scholarship (Full four-year undergraduate scholarship).

## RESEARCH AND TRAVEL GRANTS / GIFTS

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2007	[G4] HEALTHNET: NETWORKING THE WESTS (WIRELESS EMBEDDED MEDICAL SYSTEMS). Primary Investigators M. Gerla, M. Sarrafzadeh. <i>Microsoft, Inc.</i> (Gift). Amount Award: \$100,000.00. Contribution: Wrote 75% of proposal.
2007	[G3]UCLA CURRICULUM DEVELOPMENT BASED ON BODY LANS AND HEALTH MONITORING APPLICATIONS. Primary Investigators: M. Gerla, M. Sarrafzadeh. <i>Microsoft, Inc.</i> (Gift). Amount Award: \$60,000.00. Contribution: Development and pricing of equipment for curriculum.
2006	[G2]COMBINING THE STRENGTH OF DELAY TOLERANT NETWORKS WITH MOBILE AD-HOC NETWORKS FOR THE INTERPLANETARY NETWORK. Primary Investigator: <b>T. Massey.</b> <i>NASA.</i> Amount Award: \$6,000. Contribution: Wrote 100% of proposal.
2005	[G1]A SIMULATION OF A ULTRA-WIDEBAND RADIOS IN A SENSOR NETWORK. Primary Investigator: <b>T. Massey.</b> <i>NASA.</i> Amount Awarded: \$6,000. Contribution: Wrote 100% of proposal.

## TEACHING EXPERIENCE

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2008	UCLA Software Engineering, Grad. Teaching Assistant.
2007	UCLA Intro. to Engineering Disciplines, Grad. Teaching Advisor.
2007	UCLA Directed Research in Computer Science, Grad. Teaching Advisor.
2007	UCLA Bridge Review for Enhancing Eng. Students, Grad. Teaching Assistant.
2007	UCLA Programming and Problem Solving, Guest Lecturer.

## PROFESSIONAL SERVICES

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### PROGRAM COMMITTEE

2008	K-INGN(Kaleidoscope Conference in Innovations in Next Generation Networks).
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### CONFERENCE MODERATOR / VOLUNTEER

2009	Ford Academic Exchange Conference (Moderator, Engineering Session).
2006	ACM MobiCom (Volunteer, Conference on Mobile Computing and Networking).
2003	ACM SenSys (Volunteer, Conference on Embedded Networked Sensor Systems).

### REVIEWER

2009	IEEE Transactions on Very Large Scale Integration Systems.
2008	ISCAS (International Symposium on Circuits and Systems).
2007	BodyNets (International Conference on Body Area Networks).
2007	PHC (Pervasive Healthcare).
2007	ICDS (International Conference on the Digital Society).
2007	HCDMSS (High Confidence Medical Device Software and Systems).
2007	WSNHC (Wireless Sensor Networks for HealthCare).
2006	ISQED (International Symposium on Quality Electronic Design).

## UNIVERSITY / PERSONAL

2008 UCLA Future Scientist Lab Tour Day – panelist for high school students.  
2006-2008 UC EDGE Graduate Recruitment Day – moderator / panelist / tour guide.  
2007 NSF UCLA Focus Diversity Program – technical presenter.  
2007 NSF STEP-UP Accelerating Comm. College Eng. & Scientists – lab tour guide.  
2007 UCLA CS Prospective PhD Visitation Day – lab tour guide/faculty talk organizer.  
2007 Southern California Diversity Forum – panelist.  
2006 UCLA Orientation – panelist / tour guide.  
2006 CS Mentor Group – CS Dept Welcome Picnic / CS graduate mentor program.  
2006 NSBE Region Six Conference - “Graduate School 101” presentation.  
2006 GRAD LAB – “Voices from the Field” presentation.  
2006 NASA Advisory Board Member, W. LA Committee College–mentor program.

## PROFESSIONAL SOCIETY MEMBERSHIPS

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2009 JHU Black Faculty and Staff Association.  
2004-2009 IEEE (Institute of Electronic and Electrical Engineers), Member.  
2008-2009 ACM (Association of Computer Machinery), Student Member  
2006-2009 AMIA (American Medical Informatics Association), Member.  
2008-2009 AIS (Association for Information Systems), Healthcare SIG Member.  
2008-2009 AAAS (American Association for the Advancement of Science), Student Member.  
1999, 2005-2009 NSBE (National Society of Black Engineers), Member.  
2004-2007 UCLA SWE (Society of Women Engineers), Member.  
2003 Georgia Tech Minorities in Computer Science, President.  
2003 Georgia Tech Women in Computer Science, K-12 Community Outreach Chair.  
2002 Delta Sigma Theta Sorority, Inc., Member.  
2001 UNC-Wilmington NAACP, President.