

## Shaun S. Ahmadian

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**OBJECTIVE** System design and implementation

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**EDUCATION** **University of California** Los Angeles, CA  
*Masters of Science in Computer Science (GPA: 3.91)* Aug 2008

**University of California** Los Angeles, CA  
*Bachelor of Science in Computer Science (GPA: 3.67 – Cum Laude)* June 2006

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**COURSES**

- **Systems:** Advanced Operating Systems, Embedded Systems, Distributed Systems Infrastructure, Compilers, System Modeling & Optimization, Computer Network Fundamentals, Database Systems, Software Engineering, Logic Design
- **Applications:** Wireless Health, Vision as Inference, Design, modeling and analysis for embedded sensing

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**SKILLS**

- **Languages:** C/C++, Matlab, Java, R, Assembly **Web:** Basic HTML, PhP
- **Operating Systems:** UNIX/Linux; OS (kernel) development experience for x86; Embedded Real-time OS's (TinyOS and SOS)
- **Distributed/Scalable Systems:** Event-Driven, asynchronous programming (TinyOS, Emstar system); SCADA/EMS based systems (Arinc AIM platform, Areva T&D e-terra platform)
- **Hardware:** Experience with embedded processors such as Atmega, TI Msp430, XScale (PXA27x), and DSPs (Analog's BlackFin).
- **Vision/Image Processing:** Experience with vision based inference (eg: SIFT, 2D Filters, Classifiers)
- **Development Environments:** Eclipse (Java and C/C++ extensions), Visual Studio (6.0), NetBeans
- **Miscellaneous:** Familiarity with Object-Oriented Programming and principles. System modeling and simulations. Excellent troubleshooting and debugging skills. Comfortable with version control systems (CVS/SVN)

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**LEADERSHIP** **UCLA Chapter of ACM (Association for Computing Machinery)**  
*Vice President & Activity Coordinator* 2004-2006

**CourseChat: Instant Messaging for UCLA Engineering Course Management**  
*ACM Team Leader* 2004-2005

- Led effort to incorporate open-source instant messaging into the Engineering course management system.
- *Contributions:* Modifications to Java-based client and C-based server to support one-on-one chat, multi-user (conference) chat room, logging, and drawing board (see media publications below).

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**WORK** **ARINC** Marina Del Rey  
*Software Engineer* Aug. 2008 - Present

### Centralized Electrification and Traffic Control

- \$21 Million contract project with Amtrak to integrate supervisory control and data acquisition (SCADA) system for the Northeast Corridor (busiest passenger rail line in the United States by ridership and service frequency which includes Washington DC, New York and New England)
- *Centralized Traction Power Control:* Customization and enhancement of AIM platform SCADA functionality. Contributions:
  - Building electric network model for 70+ substations including catenary section load models, generation units, and transmission lines.
  - Interface Areva T&D **e-terra** platform real-time power network analysis and powerflow study application to AIM platform, allowing continuous and on-demand supervisory planning for entire traction power network.
  - Implementation of custom data acquisition software using InterSite Data protocol to communicate with Areva T&D **e-terra** platform based servers.

- *Energy Management System*: Certified training in Areva T&D **e-terra**platform in the following areas:
  - Introduction to **e-terra**habitat (3-days)
  - Programming in **e-terra**habitat (5-days)
  - Managing High Availability Systems (5-days)
  - E-terraplatform Server Installation and Maintenance (5-days)

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## RESEARCH

### Wireless Health Institute

*Research & Development*

UCLA

*May 2008 - Aug. 2008*

#### Health Monitoring

- Collaboration with Kinesiologists from UCLA VA Hospital to develop a "smart" shoe that is able to diagnose abnormal walking patterns to prevent falls in the elderly (Patent pending).
- *Contributions*: Core developer, hardware construction and data collection software (C on TinyOS), gait analysis signal processing (Matlab).

### Center for Embedded Networked Sensing

*Graduate Student Researcher*

UCLA

*Sep. 2006 - June 2008*

#### Environmental Sensing

- 2 year interdisciplinary project with UC-Riverside to develop and deploy over 30 embedded imagers for habitat monitoring at a wildlife reserve (see media publications below).
- *Contributions*: Team Leader and a core developer, sensor construction, packaging and in-field deployment, data collection (Embedded TinyOS and C), presentation framework (PhP and Adobe Flash), and server-side image processing (Matlab).

#### Green Computing

- Since most systems are rarely fully utilized, we try to reduce total system energy consumption by considering heterogeneous processors. A tiered system comprising of a low powered micro-controller (MSP430) that triggers a higher-end processor (PXA270) demonstrated that tradeoffs can be made between accuracy and energy.
- *Contributions*: Constructed a simulator (Matlab with Integer Linear Programming extension). Image processing testing (Matlab) and porting to hardware device (C).

#### Vision Processing

- Ported and evaluated state-of-the-art vision algorithm to Analog's BlackFin DSP (ADSP-BF533). Various optimizations were exploited such as fixed-point arithmetic to reduce processing time and therefore energy consumption.
- *Contributions*: Core Developer, porting of SIFT to DSP, applying platform and application specific optimizations (C/C++ using VisualDSP++).

#### Mobile Computing

- Using readily available bluetooth devices, such as cellphones, to scan and infer location and other contextual information. Explore social dynamics of day-to-day activities, sensor fusion and adaptive sampling techniques.
- *Contributions*: Core Developer, data collection (Nokia N800), clustering algorithm (Matlab).

### Center for Embedded Networked Sensing

*Intel Scholar Research Intern*

UCLA

*June 2006 - Aug. 2006*

- Collaborated on the development of wireless end-to-end transport of images collected by Cyclops, a low power embedded imaging platform.
- Extended collection mechanism to allow SQL-like querying of the imaging nodes

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## Publications

### CONFERENCES:

- Hyduke Noshadi, **Shaun Ahmadian**, Hagop Hagopian, Majid Sarrafzadeh *Hermes: Mobile Balance and Fall Risk Assessment and Prevention System*. IEEE Transactions on Information Technology in Biomedicine (Special Issue in Wireless Health 2008 - under submission)

- Michael P. Allen, Eric Graham, **Shaun Ahmadian**, Teresa Ko, Eric Yuen, Lewis Girod, Michael Hamilton, Deborah Estrin. *Interactive Environmental Sensing: Signal and Image Processing Challenges*. 33rd International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2008)
- Teresa Ko, Zainul M Charbiwala, **Shaun Ahmadian**, Mohammed Rahimi, Mani B. Srivastava, Stefano Soatto, and D Estrin, *Exploring Tradeoffs in Accuracy, Energy and Latency of SIFT in Wireless Camera Network*. (ICDSC 2007)
- Mohammed Rahimi, **Shaun Ahmadian**, David Zats, Rafael Laufer, and D Estrin, *Magic of Numbers in Networks of Wireless Image Sensors*. Workshop on Distributed Smart Cameras (ICDSC 2006).

#### **MEDIA:**

- *A New Way to See the World: UCLA Researchers Create Low-power Vision Sensors for Embedded Networks*. UCLA Engineering Newsletter. (January 2006)
- *Students Create Open Source Instant Messaging Tool: CourseChat Expands UCLA Engineering Course Management System*. UCLA Engineering Newsletter. (November 2005)
- *Student engineers develop program for online class discussions*. UCLA Daily Bruin. (May 20, 2005)

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#### **References**

Will provide upon request.