SIDHANT GUPTA

Seattle, WA, 98105, USA
Phone: +1-206-651-4055
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I invent new sensing techniques and build innovative **hardware and software systems**. My research often requires identifying and exploiting physical phenomenas around us in unique ways to continually redefine what, and how, signals can be sensed. In addition to computer science, my research incorporates a deep understanding of **applied physics, embedded systems, design-for-manufacturability, machine learning, software-defined radios and cyber-physical security**.

EDUCATION

Ph.D. 09/2009 – 06/2014	**University of Washington,** Computer Science & Engineering. Area: Ubiquitous Computing, Embedded Systems & HCI Advisor: Dr. Shwetak N. Patel Thesis Title: "ElectriSense: Single-Point Sensing Using EMI for Electrical Event Detection and Classification in the Home"
Masters of Science 8/2007 – 5/2009	**Georgia Institute of Technology,** Computer Science. Areas: Mobile & Ubiquitous Computing, Intelligent Systems. Advisor: Dr. Gregory D. Abowd GPA: Major **4.0/4.0**, Overall 3.92/4.0
Bachelor of Technology 8/2003 – 5/2007	**GGSIP University**, India, Computer Science & Engineering. Institute: Amity School of Engineering & Technology. GPA: 82/100. **Top 5%** of the 2007-graduating batch.

PROFESSIONAL EXPERIENCE

Microsoft Research **Redmond, WA**	**Researcher**, June 2014 – Current Computational User Experience Group
Micorosoft Research **Redmond, WA**	**Research Intern,** June 2011 – September 2011 **Research Consultant,** October 2011 – September 2012 Advisor: Dr. Desney S. Tan Researched and developed non-contact remote haptic prototypes and one novel interaction technique. Also developed an ungrounded kinaesthetic feedback device for mobile devices.
Belkin International Inc. **Los Angeles, CA**	**Research & Development Consultant,** February 2010 – June 2014 Involved in R&D with the Conserve product line. Duties include core technical development of hardware, firmware, digital signal processing algorithms and machine learning models.
Intel Research Labs **Seattle, WA**	**Research Scientist Intern,** May 2008 – August 2008 & May 2009 – August 2009 Advisor: Dr. Jeffrey Hightower Researched and developed several non-vibro-tactile Haptic feedback systems. My research explored texture, shape, push-and-pull forces, and springiness as Haptic feedbacks.
Georgia Tech **Atlanta, GA**	**Graduate Research Assistant**, August 2007 – May 2009 Advisor: Dr. Gregory D. Abowd

AWARDS AND ACHIEVEMENTS

- Named **'Forbes 30 under 30'** technology disrupters by Forbes magazine in January 2012.
- **4 best papers** and **3 nominations** at top-tier peer reviewed conferences.
- Intel Science & Technology **Fellowship** for 2011-2012
- Kumar & Roberta L. Bhasin Endowed **Fellowship** for 2011
- Donald C. Whitworth endowed **Fellowship** for 2009-2010
- Won the **Madrona prize** twice for the "greatest commercial potential" graduate research work.
- **Best Project** Award for "ICU Monitoring System" amongst all university final year projects in 2007.

MAJOR CONFERENCE PUBLICATIONS (Peer-reviewed)

[C.17] Pu, Q., **Gupta, S**., Gollakota, S., Patel S.N. WiSee: **Whole-Home Gesture Recognition Using Wireless Signals**. MobiCom 2013, Sept. 30-Oct. 4, Miami, Florida. ***Best Paper Award***

[C.16] Oluwafemi, T., **Gupta, S**., Patel S.N., Kohno, T. **Experimental Security Analyses of Non-networked Compact Fluorescent Lamps: A Case Study of Home Automation Security**. USENIX LASER 2013, Oct. 16-17, Virginia, USA.

[C.15] **Gupta, S.,** Morris, D., Patel S.N., Tan, D. **Airwave: Non-Contact Haptic Feedback Using Air Vortex Rings**. Ubicomp 2013, Sept. 8-12, Zurich, Switzerland.

[C.14] Aumi, T.I., **Gupta, S**., Goel, M., Larson, E., Patel S.N. **DopLink: Using the Doppler Effect for Multi-Device Interaction**. Ubicomp 2013, Sept. 8-12, Zurich, Switzerland.

[C.13] Chen, K., Cohn, G., **Gupta, S**., Patel S.N., uTouch: Sensing Touch Gestures on Unmodified LCDs. CHI 2013, Paris, France, April 27- May 2, 2013.

[C.12] Cohn, G., **Gupta, S**., Lee, T.J., Morris D, Smith, J.R., Reynolds, M., Patel S N, Tan D. **An Ultra-Low-Power Human Body Motion Sensor Using Static Electric Field Sensing.** Ubicomp 2012, Pittsburgh, Pennsylvania, September 5-8, 2012. ***Best paper award***

[C.11] **Gupta, S**., Morris D, Patel S N, Tan D. **SoundWave: Using the Doppler Effect to Sense Gestures.** CHI 2012, Austin, Texas, May 5-10, 2012.

[C.10] Badshah, A., **Gupta, S.**, Morris D, Patel S N, Tan D. **GyroTab: A Handheld Device that Provides Reactive Torque Feedback**, CHI 2012, Austin, Texas, May 5-10, 2012.

[C.9] **Gupta, S.**, Chen, Ke-Yu., Reynolds, M., Patel, S.N. **LightWave: Using Compact Fluorescent Lights as Sensors.** UbiComp 2011, Beijing, China, September 17-21, 2011. ***Best paper nominee (top 1.6%)* & *Best poster award***

[C.8] Enev, M. **Gupta, S.**, Kohno T, Patel S.N. **Televisions, Video Privacy, and Powerline Electromagnetic Interference**. CCS 2011, Chicago, USA, October 17-21, 2011.

[C.7] Badshah, A., **Gupta, S.**, Cohn, G., Villar, N., Hodges, S., Patel, S.N. **Interactive Generator: A Self-Powered Haptic Feedback Device.** CHI 2011, Vancouver, British Columbia, Canada, May 7-12, 2011. ***Best note award*.**

[C.6] Larson, E., Cohn, G., **Gupta, S.**, Ren, X., Harrison, B., Fox, D., Patel, S.N. **HeatWave: Thermal Imaging for Surface User Interaction.** CHI 2011, Vancouver, British Columbia, Canada, May 7-12, 2011. ***Best paper nominee***

[C.5] **Gupts,S**., Campbell, T., Hightower, J.R., Patel, S.N. **SqueezeBlock: Using Virtual Springs in Mobile Devices for Eyes-Free Interaction.** UIST 2010, New York, USA, Oct 3-6, 2010.

[C.4] **Gupta, S**., Reynolds, M.S., Patel, S.N. **ElectriSense: Single-Point Sensing Using EMI for Electrical Event Detection and Classification in the Home**. UbiComp 2010, Copenhagen, Denmark, Sep 26-29, 2010. ***Best paper award***

[C.3] Cohn, G., **Gupta, S**., Froehlich, J., Larson, E., and Patel, S. **GasSense: Appliance-Level, Single-Point Sensing of Gas Activity in the Home**. *Proceedings of Pervasive 2010*, Helsinki, Finland, May 17-20, 2010.

[C.2] Patel, S., Kientz, J., **Gupta, S**. **Studying the Use and Utility of an Indoor Location Tracking System for Non-Experts.** *Proceedings of Pervasive 2010*, Helsinki, Finland, May 17-20, 2010.

[C.1] Patel, S., **Gupta, S**., Reynolds, M. **The Design and Evaluation of an End-User-Deployable, Whole House, Contactless Power Consumption Sensor.** *Proceedings of CHI 2010*, Atlanta, USA, April 10-15 2010. ***Best of CHI nominee***

REFEREED JOURNAL AND MAGAZINE PUBLICATIONS

[J.2] Cohn, G., **Gupta, S**., Goel, M., Chen, K., Patel, S.N. **Supporting Ubiquitous Interactions Using Hidden Signals**. Under Final Review for Communications of the ACM.

[J.1] Froehlich, J., Larson, E., **Gupta, S**., Cohn, G., Reynolds, M., Patel, S. N. "**Disaggregated End-Use Energy Data for the Smart Grid**" IEEE Pervasive Computing, Special Issue on Smart Energy Systems, Volume 10, Issue 1, Jan–Mar 2011.

SERVICE

Program Committee Member
Ubicomp 2013, ACM International Joint Conference on Pervasive and Ubiquitous Computing.

Student Volunteer
Chair (2011), volunteer (2010). The International Conference on Ubiquitous Computing.

Reviewer
CHI 2011, 2012, 2013, 2014 | Pervasive 2009, 2012, 2011 | Ubicomp 2010, 2011, 2012, 2013 | UIST 2011, 2012, 2013 | IoT 2010 | ISCAS 2009 | ACM TiiS 2013 | Mobicom 2013 | Mobil HCI 2012, 2013 | Energies 2013 | Journal ADVEI 2013 | EGICE 2012 | PECON 2012 | IEEE Pervasive Computing 2013 | Journal of Machine Learning Research 2013

SELECTED PRESS COVERAGE (Popular Web, Print and Television)

- **Scientific American.** Wi-Fi Wobbling Hand Gestures Could Control Home. Karen Hopkins. Oct 17, 2013.
- **The Washington Post.** Hands down (and hands up), this is the coolest technology of the week. Dominic Basulto. Jun 07, 2013.
- **BBC News.** Wisee uses wi-fi signals to recognise body gestures. Leo Kelion. Jun 05, 2013.
- **Computing Research Association (CRA).** WISEE: WI-FI Signals enable gesture recognition throughout entire home. Jun 07, 2013.
- **Popular Science.** Use Universal Gesture Control From Any Room In Your House. Dan Nosowitz. Jun 06, 2013.
- **CCTV (China's National TV).** Gesture Recognition Allows Consumers to Control Electronics with Simple Hand Movements. Correspondent Mark Niu. Aired Aug 2, 2013.
- **MIT Technology Review.** Belkin Gadget Will Reveal How Much Energy Your Devices Use. Rachel Metz. Aug 01, 2013.
- **ZeeNews (Indian TV Network).** Wi-Fi signals can recognise human gestures: Researchers. Aired Jun 06, 2013.
- **The Register.** Boffins build gesture recognition using WiFi. Richard Chirgwin. Jin 05, 2013.
- **The Indian Express.** New wi-fi based tech developed by Indian-origin researchers reads gestures. Jun 06, 2013.
- **Engadget.** WiSee uses WiFi signals to detect gestures from anywhere in your house. Melissa Grey. Jun 05, 2013.
- **Wired.co.uk.** WiSee uses modified Wi-Fi router to recognise gestures through walls. Olivia Solon. Jun 05, 2013.
- **The Verge.** WiSee prototype detects gestures from the next room using only Wi-Fi. Dieter Bohn. Jun 04, 2013.
- **Los Angeles Times.** WiSee taps Wi-Fi to control household devices with body gestures. Paresh Dave. Jun 04, 2013.
- **Ars Technica.** Researchers teach Wi-Fi to "see," identify gestures. Sean Gallagher. Jun 05, 2013.
- **Slashgear.** WiSee uses Wi-Fi to detect gesture commands from any location. Brittany Hillen. Jun 5, 2013.
- **ZDNet.** WiSee: Gesture recognition tech is closer than you might think. Steven J. Jun 06, 2013.
- **Business Standard.** New Wi-Fi based tech reads gestures to control appliances. Jun 06, 2013.
- **Yahoo TechNews.** WiSee Detects Your Gestures Using WiFi. Elizabeth Palermo. Jun 05, 2013.
- **ExtremeTech.** Turning a standard LCD monitor into touchscreen with a $5 wall-mounted sensor. Sebastian Anthony. Apr 25, 2013.
- **MIT Technology Review.** A Simple Way to Turn Any LCD into a Touch Screen. Rachel Metz. Apr 24, 2013.
- **MIT Technology Review.** Another Reason for "Smart" Electric Meters. David Talbot. Oct 19, 2012.
- **CNN Money**. Control your laptop with a wave of your hand. David Goldman. August 7, 2012.
- **Technology Review**. Gesture Control System Uses Sound Alone. Rachel Metz. May 7, 2012
- **PC World**. Gesture Sensing Alternatives Use Radio Interference, Doppler Effect. Nick Barber. May 09, 2012.
- **The Verge**. Microsoft creates Kinect-like motion control for laptops using sound waves. Tom Warren. May 08, 2012.
- **Discovery News**. Laptop uses sound for gesture control. Jesse Emspak. May 09 2012.
- **CNET**. Microsoft SoundWave: It's like Kinect, but skips the cameras. Don Reisinger. May 08, 2012.
- **GizMag**. SoundWave uses Doppler Effect to bring Kinect-like gesture recognition to PCs. Darren Quick. May 08, 2012.
- **Techie Buzz**. Microsoft Develops Kinect Like Gesture Recognition without Cameras. Pallab De. May 08, 2012.
- **Computing Community Consortium.** Turning the Body Into a Wireless Controller. Erwin Gianchandani. May 25, 2012.
- **Popular Mechanics.** Next Up in Kinect-Style Motion Sensing: Ultrasound? Jon M. Chang. May 25, 2012.
- **New Scientist**. Beyond Kinect: Gestural computer spells keyboard death. Jim Giles. May 15, 2012.
- **The Times of India.** 10 Indians Rub Shoulders with Zuckerberg in Forbes' List. Dec 21, 2011.
- **The Economic Times.** 10 Indians in Forbes '30 under 30' list. Maneet Ahuja. Dec 20, 2011.
- **Aaj Ki Khabar.** 10 Indians among Forbes' 'tomorrow's brightest stars'. Mayank Kumar. Dec 21, 2011.
- **DNA India.** 10 Indians among Forbes's 'tomorrow's brightest stars'. Arun Kumar. Dec 21, 2011.
- **The Indian Express.** 10 Indians figure in Forbes' '30 under 30' list. Dec 21, 2011.
- **Popular Science.** Squeezable Cellphone Gives Firmness-Based Feedback. Dan Nosowitz. October 12, 2010.
- **New Scientist**. Innovation: The smartphone's shape-shifting future. Gareth Morgan. October 11, 2010

PATENTS (Full Utility)

[4 more unpublished patent applications]

[P.6] US2013/0154919: User Control Gesture Detection

[P.5] WO2013/040497: Systems and Methods for Sensing Environmental Changes Using Light Sources as Sensors

[P.4] US2012/0068692: Systems and Methods for Measuring Electrical Power Usage in a Structure and Systems and Methods of Calibrating the Same

[P.3] US2012/0072143: System for Monitoring Electrical Power Usage of a Structure and Method of Same

[P.2] US2013/0179124: Electrical Event Detection Device and Method of Detecting and Classifying Electrical Power Usage.

[P.1] US2011/0282596: Apparatus Configured to Detect Gas Usage, Method of Providing Same, and Method of Detecting Gas Usage.

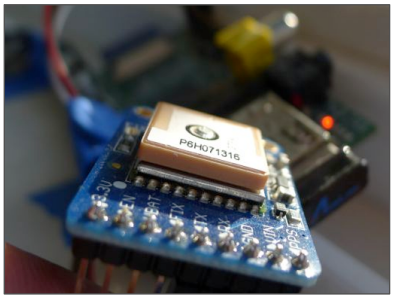
INVITED TALKS AND PRESENTATIONS

- **CSEP 510, Human-Computer Interaction, Guest speaker** (October 28, 2013)
  Ubiquitous Computing: Past, Present and Future
- **Computer Science & Engineering Affiliates Day** (October 23, 2013)
  1. WiSee: Whole-Home Gesture Recognition Using Wireless Signals
  2. Airwave: Non-Contact Haptic Feedback Using Air Vortex Rings
- **Northwest Regional Women in Computing, Distinguished speaker** (October 19, 2013)
  Ubiquitous Computing: Our approach to technology innovations by hacking our surroundings
- **HackThings Meetup @ Synapse, Guest speaker** (August 2, 2013)
  Hacks for Innovation: Our approach to developing technology innovations by hacking our surroundings
- **CSE 390L, Leadership Seminar Series, Panellist** (February 12, 2013)
- **Creating Responsive Environments, Guest speaker** (January 22, 2013)
  Directions in Environmental Sensing & Ubiquitous Computing
- **Computer Science & Engineering Affiliates Day** (October 24, 2012)
  Using the Doppler Effect on Commodity Mobile Devices for Gesture-based Interaction
- **Undergraduate Direct Admits Seminar, Guest speaker** (October 15, 2012)
  Ubiquitous Computing and Sensor Based Interaction
- **Disney Research** (September 7, 2012)
  An Overview of the Research in UW Ubicomp Lab
- **Microsoft Research Recently Written Series** (June 12, 2012)
  Non-contact Haptic Feedback Using Air Vortices
- **CSEP 510, Human-Computer Interaction** (May 21, 2012).
  Ubiquitous Computing: Sensing systems for human activity, context and off-the-desktop interactions
- **INFO 463, Input and Interaction, Guest speaker** (May 17, 2012).
  Sensor based interactions
- **International Workshop on Non-Intrusive Load Monitoring** (May 7, 2012)
  ElectriSense: Using Electromagnetic Interference for Electrical Event Detection and Classification
- **Computer Science & Engineering Affiliates Day** (October 19, 2011)
  Televisions, Video Privacy, and Powerline Electromagnetic Interference
- **Dorkbot Seattle 0x41, Guest Speaker** (February 2, 2011)
  Clever Sensing for Energy Feedback & Cool Haptics
- **Computer Science & Engineering Affiliates Day** (October 27, 2010)
  Mobile Haptic Feedback - SqueezeBlock
- **Electrical Engineering Graduate Admissions Seminar** (March 14, 2010)
  Overview of Research at the Ubiquitous Computing Lab at UW
- **Computer Science & Engineering Affiliates Day** (October 29, 2009)
  Infrastructure Mediated Sensing: Low Cost, Single Point Sensing of Gas and Electrical Events

SELECTED SUPPLEMENTAL PROJECTS

[Personal and professional projects outside of core research efforts. Also listed are key technologies and skillsets used]

GPS disciplined Stratum-1 clock
with avg. jitter < 3 us and avg. offset < 300 ns. Used for synchronizing sensor nodes and servers for my data collection efforts.



RaspberryPi; Custom Linux kernel with PPS (ATOM) support, NTP services; BASH scripts for headless operation; RRDTool based remote monitoring.

FireFly: High performance WiFi DAQ
with 14 channels, 12-bit 2 MHz ADC, local data backup, remote configuration and scalable cloud storage backend.

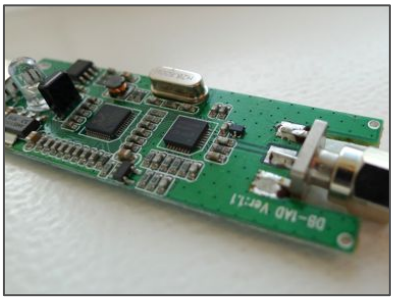
Custom kernel and modules; High-speed mixed signals PCB design, C firmware handling real-time sampling and DMA chaining, USB CDC and custom boot loader.

FireFly Cloud Server
Scalable asynchronous data handler for FireFly nodes. Up to 600 requests/sec/core (~250 FireFly nodes on 1 laptop)

```
class FireflyDataHandler(tornado.web.RequestHandler):
    def get(self):
        self.write("Use POST")

    @tornado.web.asynchronous
    def post(self):

        fileinfo = self.request.files['sendfile'][0]
        deviceID = self.get_argument('id')
        start_ts = self.get_argument('start_ts')
        fireflyPacket = fileinfo['body']
        print "Length of data: " + str(len(fireflyPacket)) + " Ty

        #Back it up immediately
        if deviceID not in self.application.nodes:
            #Setup backup directory
            mkdir_p(self.application.backup_dir + "/" + deviceID

        fname = start_ts + "_" + deviceID + ".dat"
        raw_path = self.application.backup_dir + "/" + deviceID +
        try:
            fh = open(raw_path + "/" + fname, 'wb')
            try:
```

Python Tornado web framework; Panda, Scipy and Numpy for mathematical computation. Currently deployed in multiple production settings.

Security audit of sensitive pager messages (commonly used by hospitals) and **Smart meters** using $20 USB TV receiver based Software Radio.



RTL chipset based software radio; GNURadio; audio signal processing; FLEX protocol & AMR decoding in MATLAB.

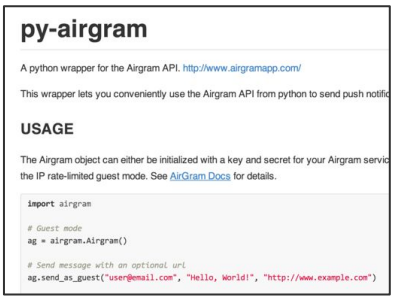
Commercial Prototypes of Research work
ElectriSense and HydroSense using DSP and embedded Linux controller. Multiple units currently deployed in commercial setting.

Analog frontend PCB design; Embedded Linux services; Precise timing synchronization Cloud interface; uC firmware.

New firmware and API for AR.Drone
to allow EE472 class to 'hack' and build upon it. Used for 3 embedded systems classes taught by Shwetak N. Patel.

Firmware in C; API task handlers for FreeRTOS based on MAVLINK like lightweight messaging protocol; Nav-data processing.

Python wrapper for the Airgram service
for sending instant push notifications to mobile phones. I personally use it for monitoring server and services anomalies.



py-airgram

A python wrapper for the Airgram API. http://www.airgramapp.com/

This wrapper lets you conveniently use the Airgram API from python to send push notific

USAGE

The Airgram object can either be initialized with a key and secret for your Airgram servic the IP rate-limited guest mode. See AirGram Docs for details.

```
import airgram

# Guest mode
ag = airgram.Airgram()

# Send message with an optional url
ag.send_as_guest("user@email.com", "Hello, World!", "http://www.example.com")
```

Code available on Github (py-airgram). Uses Python and URLLib.

Mac OS X GNU Toolchain
for ARM (Chumby device) platform based on CodeSourcery GCC. **>10,000 download** since July, 2010.

2010-08-02 18:22:26

nally!! 😎

have just managed to compile the arm-linux cross toolchain with eglibc on Mac OS X after 4 days o ozen errors and incompatibilities I came across.

had to write patches for a couple of files to make them compile. I will need to test in coming days if eory). The only thing that now remains is the GDB.

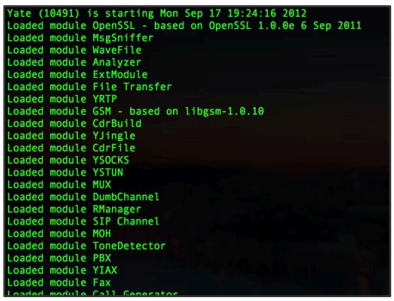
will soon post the instructions.

```
sidhant-guptas-macbook-pro:obj Sidhant$ $tools/bin/$target-gcc -v
Using built-in specs.
Target: arm-none-linux-gnueabi
Configured with: /Users/Sidhant/Projects/arm/arm-2010q1-202-arm-none-lin
2010q1/configure --target=arm-none-linux-gnueabi --prefix=/Users/Sidhant
sysroot=/Users/Sidhant/arm-linux/sysroot --enable-__cxa_atexit --disable
--disable-libmudflap --enable-languages=c,c++
Thread model: posix
gcc version 4.4.1 (GCC)
```

2010-08-05 10:07:48 (edited by sidhant 2010-08-05 10:08:58)

Lots of C/C++ debugging, custom Make patches and Autotools scripting.

SIP/VOIP server for Ubicomp Lab
for encrypted call termination. Now being used for SpiroSmart's call-in service data collection.



```
Yate (10491) is starting Mon Sep 17 19:24:16 2012
Loaded module OpenSSL - based on OpenSSL 1.0.0e 6 Sep 2011
Loaded module MsgSniffer
Loaded module WaveFile
Loaded module Analyzer
Loaded module ExtModule
Loaded module File Transfer
Loaded module YRTP
Loaded module GSM - based on libgsm-1.0.10
Loaded module CdrBuild
Loaded module YJingle
Loaded module CdrFile
Loaded module YSOCKS
Loaded module YSTUN
Loaded module MUX
Loaded module DumbChannel
Loaded module RManager
Loaded module SIP Channel
Loaded module MOH
Loaded module ToneDetector
Loaded module PBX
Loaded module YIAX
Loaded module Fax
```

Linux with Hyper-v support, Yate server and custom routing rules.

STUDENTS SUPERVISED

- **Alexander T. Ching** (Summer 2013)
  Built production quality power measurement sensors for FireFly sensor node based ground-truth data collection as part of the ElectriSense project.
- **Ritvik Mishra** (Summer 2013)
  Summer intern with Ubicomp Lab. Prototype and design refinement of heart-rate sensing wristwatch for longitudinal measurements.
- **Cameron Pickette** (2012, 2013)
  Independent study with Shwetak Patel. Low-level firmware for Linux based embedded sensor platform called FireFly. Also, co-developed a large sensor network data collection server in Python.
- **Brendan Lee** (Spring 2012)
  Independent study with Shwetak Patel. Ported SoundWave to Android and built new interaction applications.
- **Elizabeth Kim** (Spring 2012)
  Independent study with Shwetak Patel. Designed a Kinect game for remote haptics project.
- **Patrick Larson** (Winter, Spring 2012, 2013)
  Independent study with Shwetak Patel. Managed lab core server and built a reverse VNC lab portal. In 2013, co-developed large sensor network data collection server in Python.
- **Akash Badshah** (Summer 2010)
  Summer intern with Ubicomp Lab. Developed a self-powered haptic feedback device called InGen. Led to paper publication at CHI 2011.
- **Jonas Michel** (Winter, 2010)
  Independent study with Shwetak Patel. Built android and OBD-II based car efficiency monitoring system.

TEACHING

Teaching Assistant
CSE 477, Digital System Design (Spring 2012 and 2013)
ETCS309, Database Management Systems, Amity School of Engineering and Technology (Fall 2006)

Guest Lectures
CSE 599U: Advanced Topics in Ubiquitous Computing (Winter 2012)
Topic: "Advanced Prototyping: Software Radios"

CSE 477, Digital Systems Design Hardware Capstone (Spring 2010, 2011, 2012)
Topic: "Software Radio and Rapid Prototyping"

REFERENCES

Dr. Shwetak N. Patel
Associate Professor
University of Washington
shwetak@cs.washington.edu

Dr. Desney S. Tan
Principal Researcher
Microsoft Research, Redmond
desney@microsoft.com

Anthony LaMarca
Principal Engineer
Intel Corporation
anthony.lamarca@intel.com

Dr. Gregory D. Abowd
Distinguished Professor
Georgia Institute of Technology
abowd@gatech.edu

Kevin Ashton
General Manager
Belkin International Inc.
Kevin.ashton@belkin.com

Additional references can be provided upon request.