

PANKIL M BUTALA

pankil.butala@gmail.com

www.pankilbutala.com

(213) 399-3988

EDUCATION

Boston University, Boston, MA

May 2015

Doctor of Philosophy, Electrical and Computer Engineering

GPA: 3.96

- Ph.D. Thesis: Design, analysis and optimization of optical MIMO communication systems under illumination constraints. Advisor: Prof. Thomas Little.
- Developed low complexity spectrally efficient MIMO OFDM signaling schemes.
- Investigated optical MIMO wireless signaling techniques.

University of California, Los Angeles, CA

2007

Master of Science, Biomedical Engineering

GPA: 3.61

- Designed multi-tap FIR/IIR digital filters.
- Developed java based GUI to parse DICOM images.
- Subjects studied include advanced digital signal processing, statistics and analog circuit design.

University of Mumbai, Mumbai, India

2006

Bachelor of Engineering, Biomedical Engineering

GPA: 3.92

- Senior project: Travelling photometer. Developed prototype for analytical laboratory instrument in R&D phase at Transasia Bio-Medicals Ltd., Mumbai.
- Subjects studied include microprocessors, computer programming, advanced digital signal and image processing, control systems, analog and digital electronic circuits.

SKILLS

- Wireless: OFDM, PHY Modulation, MIMO.
- Standards: IEEE 802.15.7 (WPAN-TG7), IEEE 802.11.x (WLAN, WiFi), 3GPP - 5G, LTE.
- Programming: ANSI C, embedded C, C++, assembly, C#, Java, SQL, objective-C, Verilog.
- Web: HTML, CSS, HTTP.
- Networking: TCP/IP, UDP, Sockets, ANT+, Bluetooth.
- Signal Processing: FFT/IFFT, Wavelets, FIR, IIR, Sampling, Interpolation, Kalman filter, EKF.
- IDEs: Visual Studio, MATLAB, Code Composer Studio, Eclipse Xilinx ISE, Xcode.
- Version Control: GitHub, SVN.
- Microcontrollers: TI TMS320x DSP, TI MSP430x MSP, Infineon C166x μ C.

WORK EXPERIENCE

Qualcomm, Inc., San Diego, CA

June 2015 – Present

Senior RF Embedded Software Engineer

- Innovate, design and implement embedded drivers for cutting edge RF and modem hardware to support 4G and 5G wireless technologies.
- Work with protocol, firmware and test teams to drive design, implement interfaces and algorithms and ensure conformance to 3GPP standards.
- Participate in product development lifecycle from inception and design to bring-up, optimization, verification and commercialization.
- Develop python/perl based data parser and debug tools.

**Multimedia Communication Laboratory and Smart Lighting Engineering Research Center,
Boston University, Boston, MA** **September 2011 – June 2015**

Research Assistant

- Designing Xilinx FPGA based optical wireless 4x4 MIMO system with an imaging receiver and implementing OFDM variant as modulation at PHY.
- Generating optical MIMO system specifications to develop prototypes in collaboration with partners.
- Developed a wireless, networked color sensor platform (CuSP) to deploy in smart spaces.
- Designed an iOS app and wireless, networked inertial sensors (FAM) for monitoring, detection and real time classification of functional activity.

Advanced Analytical Technologies, Inc., Ames, IA **March 2009 – July 2010**

Software Engineer

- Developed GUI data analysis and controller software in C# for analytical laboratory instruments.
- Implemented real time control, digital signal processing, pattern search and match algorithms.

Enova Systems, Inc. / Hyundai Enova ITC, Torrance, CA **August 2007 – March 2009**

Software Engineer

- Developed embedded code in C/C++ for hybrid vehicle motor drive control modules.
- Developed an in house UI tool to obtain real time system diagnostic data.

Lilavati Hospital and Research Center, Mumbai, India **June 2005 – December 2005**

Engineering Intern

- Serviced and maintained imaging, analytical and diagnostic machines.

PATENT APPLICATION

- Sensory lighting system and method for characterizing an illumination space. 2013
Inventors: R. Karlicek, R. Radke, T. Little, *P. Butala*, and L. Jia
Publication date: 2013/4/19
Patent office: US
Application number: 14/394,888

LIST OF PUBLICATIONS

- Trace-orthogonal PPM – Space time block coding under rate constraints for visible light communication. 2015
M. Biagi, A.M. Vegni, S. Pergoloni, *P. Butala*, and T. Little, *Journal of Lightwave Technology*.
- Multi-wavelength visible light communication system design. 2014
P. Butala, H. Elgala, P. Z.-Ha, and T. Little, *OWC, IEEE Globecom, Austin, TX*.
- Sample indexed spatial orthogonal frequency division multiplexing. 2014
P. Butala, H. Elgala, and T. Little, *Chinese Optics Letters*.
- Performance of optical spatial modulation and spatial multiplexing with imaging receiver. 2014
P. Butala, H. Elgala, and T. Little, *IEEE Wireless Communications and Networking, PHY and Fundamentals, Istanbul, Turkey*.
- SVD-VLC: A novel capacity maximizing VLC MIMO system architecture under illumination constraints. 2013
P. Butala, H. Elgala, and T. Little, *OWC, IEEE Globecom, Atlanta, GA*.
- Metameric modulation for diffuse visible light communications with constant ambient lighting. 2012

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P. Butala, J. Chau, and T. Little, IEEE IWOW, Pisa, Italy.

- Monitoring walking and cycling of middle-aged to older community dwellers using wireless wearable accelerometers. 2012
Y. Zhang, K. Beenakker, P. Butala, C. Lin, T. Little, A. Maier, M. Stijntjes, R. Vartanian and R. Wagenaar, IEEE EMBC, San Diego, CA.
- Wireless system for monitoring and real time classification of functional activity. 2012
P. Butala, Y. Zhang, T. Little and R. Wagenaar, COMSNETS, Bangalore, India.

CONFERENCE ORAL PRESENTATIONS

- Multi-wavelength visible light communication system design. 2014
OWC, IEEE Globecom, Austin, TX.
- Performance of optical spatial modulation and spatial multiplexing with imaging receiver. 2014
IEEE Wireless Communications and Networking, PHY and Fundamentals, Istanbul, Turkey.
- SVD-VLC: A novel capacity maximizing VLC MIMO system architecture under illumination constraints. 2013
OWC, IEEE Globecom, Atlanta, GA.
- Metameric modulation for diffuse visible light communications with constant ambient lighting. 2012
IEEE IWOW, Pisa, Italy.
- Wireless system for monitoring and real time classification of functional activity. 2012
COMSNETS, Bangalore, India.

POSTER PRESENTATIONS

- Impact of color space non-linearity on performance of color shift keying. 2015
NSF Site Review, Smart lighting ERC, Troy, NY.
- Designing a dual purpose indoor illumination and optical communication system. 2015
Industry Academia Day, Smart lighting ERC, Troy, NY.
- Designing a dual purpose indoor illumination and optical communication system. 2014
New England Networking and Systems Day, Boston, MA.
- Performance of Optical Spatial Modulation and Spatial Multiplexing with Imaging Receiver. 2014
NSF Site Review, Smart lighting ERC, Troy, NY.
- SVD-VLC: MIMO VLC architecture under illumination constraints. 2014
Industry Academia Day, Smart lighting ERC, Troy, NY.
- Indoor Diffuse Optical MIMO Communication System. 2013
NSF Site Review, Smart lighting ERC, Troy, NY.
- Metameric Modulation for Diffuse Visible Light Communications with Constant Ambient Lighting. 2013
Industry Academia Day, Smart lighting ERC, Troy, NY.

TEACHING AND MENTORSHIP

- Teaching Assistant for Electronic Circuits course. 2013
- Mentored multiple undergraduate and masters level students during summers of 2012 thru 2014

AWARDS AND LEADERSHIP

- President Student leadership council, Smart lighting ERC. Since 2014
- Chair Engineering students' workshop, Boston University. 2014
- Representative Smart lighting ERC at national level inter-ERC perfect pitch competition. 2014
- Won Perfect pitch competition, Smart lighting industry-academia event. 2014
- Vice President Student leadership council, Smart lighting ERC. 2013-2014

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| • Captain | Soccer team, Student association of graduate engineers, BU. | 2012-2013 |
| • University Chair | Student leadership council, Smart lighting ERC. | 2012-2013 |
| • Secretary | Student association of graduate engineers, BU. | 2012-2013 |
| • Representative | For ECE students, Student association of graduate engineers, BU. | 2011-2012 |
| • Dean's fellowship | Awarded at BU. | 2010-2011 |
| • Student Member | IEEE. | Since 2010 |