

# Dongmin Yoon

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## Education

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| Sep. 2009 – Present    | <b>University of Michigan</b>   | <i>Ann Arbor, MI</i> |
|                        | <ul style="list-style-type: none"><li>- Expected to graduate in <b>December 2014</b></li><li>- Ph.D. Candidate, Electrical Engineering</li><li>- Research Advisor: Professor David T. Blaauw</li><li>- Research Interests: Ultra-low power mixed signal circuit</li><li>- M.S. in Electrical Engineering, Dec. 2011 (GPA 4.0/4.0)</li></ul> |                      |
| Mar. 2001 – Dec. 2004, | <b>Seoul National University</b>  | <i>Seoul, Korea</i>  |
| Mar. 2008 – Feb. 2009  | <ul style="list-style-type: none"><li>- B.S. in Electrical Engineering (GPA 3.70/4.3)</li><li>- Military duty during Jan. 2005 – Feb. 2008</li></ul>  |                      |

## Professional Experience

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| Jan. 2010 – Present | <b>Michigan Integrated Circuits Lab (MICL), University of Michigan</b>  | <i>Ann Arbor, MI</i> |
|                     | <p>Custom circuit design, analysis, layout, and silicon measurement on ultra-low power analog circuit. Research area includes the following.</p> <ul style="list-style-type: none"><li>- Research on ultra-low power crystal oscillator circuit using DLL for wireless sensor node synchronization using commercial 180nm technology. With scheme first proposed in the research, power consumption was reduced by 4.84x compared to previously reported lowest power while maintaining frequency stability performance of the quartz crystal. Presented in ISSCC 2012.</li><li>- Research on ultra-low power SAR ADC using. Replacing capacitor DAC with different structure, the layout was all done by APR tool except comparator and sample &amp; hold circuit. (Pre-publication)</li><li>- Research on multiple conversion ratio switched capacitor network voltage regulator using commercial 180nm technology. Using multiple conversion ratio</li></ul> |                      |

- step-down converter's output as one input of step-up converter, the new scheme can produce more discrete voltage level with same number of flying capacitors.
- May 2014 – Aug. 2014    **Circuit Research Lab, Intel Labs, Intel Corporation**    *Hillsboro, OR*  
 - Design of ADC and bias voltage generator for voltage regulator
- Jun. 2013 – Aug. 2013    **Multicomm Research Group, Intel Labs, Intel Corporation**    *Hillsboro, OR*  
 Design of channel-adaptive signal detector for MIMO (Multiple-Input-Multiple-Output) communication system.
- Dec. 2004 – Feb. 2008    **MGB Endoscopy**    *Seoul, Korea*  
 Circuit design engineer for Minimally Invasive Surgery Product Group
- Circuit design and FPGA, MCU programming of CMOS HD camera for endoscopic surgery
  - Circuit design and PCB layout of power supply unit for 180W Xenon lamp. Designed to produce initial peak voltage of 30kV and regulate output current at 12A with active PFC and forward converter.
  - Circuit design of power supply unit for 300W Xenon lamp. Designed to produce initial peak voltage of 30kV and regulate output current at 21A with active PFC and forward converter.
  - Circuit design of power supply unit for 250W halogen lamp. Designed to regulate output voltage between 0~24V with active PFC and forward converter.
  - Circuit design, PCB layout, and MCU programming of video laparoscope console

## **Publications**

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1. Farhana Sheikh, Chia-Hsiang Chen, **Dongmin Yoon**, Borislav Alexandrov, Keith Bowman, Anthony Chun, Hossein Alavi, Zhengya Zhang, "3.2Gbps Channel-Adaptive Configurable MIMO Detector for Multi-Mode Wireless Communication," *IEEE Workshop on Signal Processing Systems (SiPS)*, October 2014
2. Farhana Sheikh, Elias Szabo-Wexler, Mehnaz Rahman, Wei Wang, Borislav Alexandrov, **Dongmin Yoon**, Anthony Chun, Hossein Alavi, "Channel-Adaptive Complex K-Best MIMO Detection Using

- Lattice Reduction,” *IEEE Workshop on Signal Processing Systems (SiPS)*, October 2014
3. Z. Foo, D. Devescery, M. Ghaed, I. Lee, A. Madhavan, Y. Park, A. Rao, Z. Renner, N. Roberts, A. Schulman, V. Vinay, M. Wieckowski, **Dongmin Yoon**, C. Schmidt, T. Schmid, P. Dutta, P. Chen, D. Blaauw, “A Low-Cost Audio Computer for Information Dissemination Among Illiterate People Groups,” *IEEE Transactions on Circuits and Systems I: Regular Papers*, vol.60, no.8, pp.2039,2050, August 2013
  4. Inhee Lee, Suyoung Bang, **Dongmin Yoon**, Myungjoon Choi, Seokhyeon Jeong, Dennis Sylvester, David Blaauw, “A Ripple Voltage Sensing MPPT Circuit for Ultra-Low Power Microsystems,” *IEEE Symposium on VLSI Circuits(SOVC)*, June 2013
  5. Yoonmyung Lee, **Dongmin Yoon**, Yejoong Kim, David Blaauw, Dennis Sylvester, “Circuit and System Design Guidelines for Ultra-Low Power Sensor Nodes” *IPSI Transactions on System LSI Design Methodology (TSLDM)*, February 2013, invited paper
  6. Z. Foo, D. Devescery, M. Ghaed, I. Lee, A. Madhavan, Y. Park, A. Rao, Z. Renner, N. Roberts, A. Schulman, V. Vinay, M. Wieckowski, **Dongmin Yoon**, C. Schmidt, T. Schmid, P. Dutta, P. Chen, D. Blaauw, “A Low-cost Audio Computer for Information Dissemination among Illiterate People Groups,” *Custom Integrated Circuits Conference (CICC)*, September 2012
  7. Yoonmyung Lee, Yejoong Kim, **Dongmin Yoon**, Dennis Sylvester, David Blaauw, “Circuit and System Design Guidelines for Ultra-Low Power Sensor Nodes,” *ACM/IEEE Design Automation Conference (DAC)*, June 2012, invited paper
  8. **Dongmin Yoon**, Dennis Sylvester, David Blaauw, “A 5.58nW 32.768kHz DLL-Assisted XO for Real Time Clocks in Wireless Sensing Applications,” *IEEE International Solid-State Circuits Conference (ISSCC)*, February 2012
  9. Z. Foo, D. Devescery, T. Schmid, N. Clark, M. Ghaed, Y. Kuo, I. Lee, Y. Park, N. Slottow, V. Vinay, M. Wieckowski, **Dongmin Yoon**, C. Schmidt, D. Blaauw, P. Chen, P. Dutta, “A Case for Custom Silicon in Enabling Low-Cost Information Technology for Developing Regions,” *ACM Symposium on Computing for Development*, December 2010

## Patent

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**Dongmin Yoon**, Dennis Sylvester, David Blaauw, Scott Hanson, “Pulse Injection Crystal Oscillator,” (Publication number: WO 2013123348 A1)

## Skills

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Circuit Design Tools      Cadence Virtuoso, SKILL script

Circuit Simulator	Cadence Spectre & UltraSim, Synopsis HSPICE & FineSim
Synthesis & APR Tools	Synopsis Design Compiler , Cadence SoC Encounter
Testing Tools	National Instruments LabVIEW, Mentor Graphics PADS Logic & Layout, EAGLE Layout Editor
FPGA & MPU Tools	Xilinx ISE (for Xilinx Spartan-3 series), C programming for TI MSP430 series, Microchip PIC18F series, and Atmel 89C52
Etc.	MathWorks MATLAB, Perl script