

## Bonhye Koo

3780 Keystone Ave., Apt. 101, Los Angeles, CA 90034 · Tel: (424) 901 9934 · isler@ucla.edu

### EDUCATION

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- University of California, Los Angeles, CA** Sep. 2011 – Aug. 2016 (expected)  
*Ph.D. Candidate in Chemical and Biomolecular Engineering, GPA: 4.0/4.0 (3.909/4.0 cumulated with M.S. GPA)*
- University of California, Los Angeles, CA** Sep. 2009 – Jun. 2011  
*M.S. in Mechanical and Aerospace Engineering, GPA: 3.861/4.0*
- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea** Mar. 2004 – Feb. 2009  
*B.S. in Electrical Engineering, GPA: 3.78/4.0*
- University of Technology Compiègne (UTC), Compiègne, France** Aug. 2007 – Jan. 2008  
*Exchange Student in Electrical Engineering*
- Tsinghua University, Beijing, China** Jul. 2006 – Aug. 2006  
*Exchange Student in Electrical Engineering*

### RESEARCH EXPERIENCE

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- University of California, Los Angeles, CA**  
Graduate Student Researcher, Advisor: H. Monbouquette
- Sequence specific nucleic acid detection with binary response*** Sep. 2011 – Current
- Developed a solid-state sensor to detect specific sequence of nucleic acid without requiring optical set-up and PCR
  - Fabricated a thin membrane with a pore in nanometer scale and investigated different materials to fabricate a device allowing clear response
  - Optimized pore shape and experimental parameters to detect stepwise electrical signal with low noise generate by blocking the pore with a PNA-DNA conjugated bead
- Micro sensor with fast response time and low detection limit*** Sep. 2014 – Current
- Investigated fabrication process for imprint mold to deposit aqueous chemical forming thin layer in micrometer scale
  - Developed protein imprinting technique allowing alignment
- University of California, Los Angeles, CA**  
Graduate Student Researcher, Advisor: C.-J. Kim
- Dielectric charging of EWOD*** Sep. 2009 – Aug. 2011
- Evaluated long-time performance of EWOD on different fluoropolymer top coatings (CYTOP, FluoroPel 1601V and Teflon AF 1600)
  - Investigated fabrication method to grow Ta<sub>2</sub>O<sub>5</sub> by combining sputter and anodization to allow low actuation voltage with comparable lifetime as thermal oxide
  - Characterized lifetime of EWOD under different type of voltage (positive DC, negative DC and AC)
- Plasma cleaning to recover bio-fouled surface*** Jun. 2010 – Sep. 2010
- Investigated the parameters of atmospheric oxygen plasma to recover bio-fouled EWOD surface by analyzing surface properties (contact angles, contact angle hysteresis, surface roughness, surface chemistry)
- Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea**  
Student research assistant, Advisor: Joungho Kim
- Ultra-High Density Si Interposer Design for 3D IC*** Sep. 2008 – Jan. 2009
- Conducted simulation with IC circuit parameters to improve response time and reduce poser consumption
- Ultra Wide Band (UWB)*** Jan. 2007 – Feb. 2007
- Helped a graduate student to design a transceiver SiP (system in package) with low-noise ultra wide band

### WORKING EXPERIENCE

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- University of California, Los Angeles, CA** Mar. 2010 – Current
- Teaching assistant/associate for 5 classes at UCLA***
- Heat Transfer, Molecular Biotechnology Laboratory, Bioseparations and Bioprocess Engineering, Introduction to Micromachining and Microelectromechanical Systems (MEMS) Laboratory, Introduction to Manufacturing Processes

- Led weekly recitation class/office hour, solved practice/homework problems, reviewed class material, and counseled
- Managed lab class, taught experimental skills, developed experimental process, and managed lab supplies

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## SELECTED JOURNAL PUBLICATIONS

- B.Koo**, and C.-J. Kim, "Evaluation of repeated electrowetting on three different fluoropolymer top coatings," *J. Micromech. Microeng.*, 2014, **23**, 1-6
- L.-X. Huang, **B. Koo**, and C.-J. Kim, "Sputtered-Anodized Ta<sub>2</sub>O<sub>5</sub> as the Dielectric Layer for Electrowetting-on-Dielectric," *J. MEMS*, 2013, **22**, 253-255

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## SELECTED PRESENTATIONS

- L.-X. Huang, **B. Koo**, and C.-J. Kim, "Evaluation of Anodic Ta<sub>2</sub>O<sub>5</sub> As The Dielectric Layer for EWOD devices," *Prof. IEEE Int. Conf. MEMS*, Paris, France, Jan. 2012

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## LEADERSHIP EXPERIENCE

### Korean Graduate Student Association in University of California, Los Angeles

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|---------------------------|-----------------------|
| <i>Vice President</i>     | Sep. 2011 – Aug. 2012 |
| <i>Accounting Manager</i> | Sep. 2010 – Aug. 2012 |
- Organized social events and managed company recruiting for Korean graduate students in UCLA
  - Directed mentor program for high school students visiting from Korea

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## HONORS AND AWARDS

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|---|---|
| <b>Awarded Graduate Division Fellowship from University of California, Los Angeles</b>  | Sep. 2012 – Jun. 2013                       |
| <b>Awarded Science and Engineering Scholarship from Korea Research Foundation</b>   | Mar. 2004 – Feb. 2008                       |
| <b>Awarded Dongbu Scholarship from Dongbu Foundation</b>  | Mar. 2006 – Feb. 2008                       |
| <ul style="list-style-type: none"> <li>• Selected based on high GPA (4.04/4.3) for Spring, 2006 as a representative of Electrical Engineering department</li> </ul> |   |
| <b>Awarded KAIST Scholarship for exchange students</b>  | Aug. 2007 – Jan. 2008, Jul. 2006– Aug. 2006 |
| <b>The Human-tech Thesis Competition by Samsung Electronics</b>   | Feb. 2004                                   |
| <ul style="list-style-type: none"> <li>• Awarded bronze medal in Physics category</li> </ul>  |   |

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## SKILLS

### Microfabrication and Characterization

- Photolithography, dry etching (AOE, DRIE, FDRIE, Ulvac oxide etcher, XeF<sub>2</sub> etcher), wet etching (KOH, HF, BOE, Au/Cr etchant, piranha) and deposition(LPCVD, PECVD, oxidation furnace, ALD, CHA/Sloan evaporator, sputter)
- SEM, FIB, AFM, Nanospec, profilometry, ellipsometry

**Programming languages:** L-Edit, CAD, LabVIEW, MATLAB, C/C++, Java, MS Office.

**Manufactureing Skills:** Waterjet cutter, 3-D printer, EDM, CNC mill

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## OTHER

- Basic in French (achieved DELF A2), Fluent in English, Native in Korean
- Viola (president of Viola part in 2006 and viola players for 5 years at KAIST orchestra), Basketball (founder of KAIST women basketball team, 1<sup>st</sup> place and 2<sup>nd</sup> place in KAIST Women Basketball 3 on 3 tournament in 2006 and 2005 respectively), Tennis, Yoga, Table Tennis, Badminton