



Multifunctional and Integrated Nanosystems Technology (MINT) Laboratory
School of Mechanical, Aerospace and Systems Engineering
Korea Advanced Institute of Science and Technology (KAIST)

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POSITION

ASSOCIATE PROFESSOR (Jan 2009 – Present)

Affiliation: Department of Mechanical Engineering / School of Mechanical, Aerospace & Systems Engineering

Co-affiliation: KAIST Institute for Design of Complex Systems (KIDCS) / KAIST Institute for the NanoCentury (KINC) / Mobile Sensor and IT Convergence (MOSAIC) Center
Korea Advanced Institute of Science and Technology (KAIST)

RESEARCH INTERESTS

- Micro/nanotechnologies for environmental monitoring and treatment systems
- Multiscale and hybrid manufacturing technologies for advanced electronics applications
- Flexible / wearable electronics for biomedical and environmental sensing systems
- Mechanics & reliability of micro/nanoscale structures and systems

EDUCATION BACKGROUND

PH.D. IN MECHANICAL ENGINEERING (Dec 2007)

University of California, Berkeley, USA

Dissertation Title: “Nanowire sensor for real-time chemical and biological detection”

Advisors: Professor Albert P. Pisano (Committee Chair, Department of mechanical engineering), Professor Liwei Lin (Co-chair, Department of mechanical engineering), and Professor Andrew Neureuther (Co-chair, Department of electrical engineering and computer science)

Major Field: MEMS / NANO

Minor Fields: Control and systems; Electrical engineering

MS IN MECHANICAL ENGINEERING (Aug 2003)

University of Illinois, Urbana-Champaign, USA

Thesis Title: “Study of thermal oxidation of tantalum thin film and its protection by Ta₂O₅ and Al₂O₃ thin film layers for microscale chemical reactors”

Advisor: Professor Mark A. Shannon

BS IN MECHANICAL ENGINEERING (Feb 1998)

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea
Graduation with *Summa Cum Laude* (Rank: 1/88)

STUDENT EXCHANGE PROGRAM (Spring 1996)

Royal Melbourne Institute of Technology (RMIT), Melbourne, Australia

AWARDS & HONORS

- Outstanding Paper Award, Korean Society of Manufacturing Technology Engineers (KSMTE), Apr 2012
- Outstanding Teaching Award, Department of Mechanical engineering, KAIST, Mar 2012
- HP Open Innovation Research Award, Hewlett Packard (HP) Company (USA), Aug 2011
- HP Open Innovation Research Award, Hewlett Packard (HP) Company (USA), Aug 2010
- Best Paper Award, IEEE NANO '2010 Conference, Aug 2010
- HP Open Innovation Research Award, Hewlett Packard (HP) Company (USA), Aug 2009
- Best Poster Presentation Award, ASME MICRO/NANO Forum, ASME IMECE 2007, Nov 2007
- Outstanding Graduate Student Instructor (GSI) Award, UC Berkeley Graduate Division, Spring 2006
- Grant-In-Aid Fellowship, UC Berkeley, Fall 2005-Spring 2006
- Best Performance in Doctoral Preliminary Examination, UC Berkeley, Spring 2004
- Best Graduate Award, Mechanical Engineering Department, KAIST, Spring 1998
- Summa Cum Laude (1st of 88 Graduates in Mechanical Engineering Department), KAIST, Spring 1998
- Korean Governmental Scholarship, KAIST, 1994-1998
- Travel and Tuition Grant for Exchange Student Program to RMIT, KAIST, Spring 1996

PROFESSIONAL EXPERIENCE

ASSOCIATE & ASSISTANT PROFESSOR (Jan 2009-Present)

Department of Mechanical Engineering / School of Mechanical, Aerospace & Systems Engineering
KI for Design of Complex Systems (KIDCS) & KI for the NanoCentury & Mobile Sensor and IT Convergence (MOSAIC) Center

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

- Director of MINT Lab (Multifunctional and Integrated Nanosystems Technology Lab) at KAIST – <http://mintlab1.kaist.ac.kr>,
- *Major research topics* : micro/nanostructure-based sensor devices & systems; multiscale manufacturing process for electronics and energy applications; flexible / wearable electronics for biomedical & environmental sensing platforms, reliability of micro/nano-devices and systems
- *Courses taught* : Applied electronics (MAE307), Sensor and instrumentation engineering (MAE505), Deformation, fracture, and strength of materials (MAE432), Principles and applications of sensor engineering (MAE800C), Solid Mechanics (MAE231), Freshman seminar (HS100)
- *Project advisor* : Creative system design II (MAE404), Freshmen design course (ED100)

CO-FOUNDER AND CHIEF TECHNOLOGY OFFICER (Jan 2008-Jan 2009)

nPrint Solutions, San Jose, CA, USA (<http://www.nprintsolutions.com>)

- Development of a high-speed, low-cost nanoscale printing system and high quality direct nanoimprinting services for flexible display, photovoltaic panels, and sensors

RESEARCH SPECIALIST (Dec 2007-Nov 2008)

Berkeley Sensor and Actuator Center (BSAC), University of California, Berkeley, USA

- Development of 1) nanowire array devices for in-situ monitoring of biomass energy conversion process, 2) large scale nanopatterning processes, and 3) hybrid nanofabrication processes
- Proposal writing for federal and industry projects and supervision of graduate student researchers

INTERN RESEARCHER (Jun – Dec 2005)

Quantum Science Research (QSR) Group, Hewlett-Packard Laboratory, Palo Alto, CA, USA

- Development of a novel nanoimprinting system with extreme overlay accuracy and high throughput; System design, numerical simulation, and nanoimprinting test

- Design and development of silicon nanowire-based intracellular biochemical sensor for pH and protein level detection

TEACHING EXPERIENCES (before KAIST)

GRADUATE STUDENT INSTRUCTOR (GSI) (Jan-May 2005)

Mechanical Engineering Department, University of California, Berkeley, USA

- Leading of a mechanical engineering experimental lab (ME107B) on mechanical system dynamics & vibration with lab sessions, discussion sessions, and office hours
- Curriculum design with additional experiments and data analysis methods
- Outstanding Graduate Student Instructor (GSI) Award for outstanding performance in instructions, UC Berkeley Graduate Division, Spring 2006

TEACHING ASSISTANT (TA) (Aug 2001-May 2002)

Mechanical and Industrial Engineering Department, University of Illinois, Urbana-Champaign, USA

- Assistance for professors with junior and senior level courses by teaching classes, managing lab sessions, holding office hours, discussion sessions and grading reports, quizzes, and homework
- Courses include ME231 (Engineering Materials) and ME261 (Fundamentals of Signal Processing, Instrumentation, and Control)

RESEARCH EXPERIENCES (before KAIST)

RESEARCH SPECIALIST (Dec 2007-Nov 2008)

Berkeley Sensor and Actuator Center (BSAC), University of California, Berkeley, USA

- Development of multifunctional nanosensor array and microfluidic device for in-vitro physiological monitoring of biomass energy conversion process in conjunction with synchrotron radiation-based Fourier transform infrared (SR-FTIR) spectromicroscopy [Collaboration with Dr. Hoi-Ying Holman at Lawrence Berkeley National Lab and Ms. Robin Miles at Lawrence Livermore National Lab]
- Development of novel top-down, bottom-up hybrid nanofabrication technologies for low-cost, high-throughput, and environmentally benign nanomanufacturing process for electronic, sensor, and energy conversion devices [Collaboration with Dr. Stan Williams at Hewlett-Packard Labs]
- Development of nanowire-based biosensor for in-situ DNA, RNA hybridization / dehybridization monitoring and sickle cell disease diagnosis [Collaboration with Dr. Frans Kuypers at Children's Hospital & Research Center Oakland; CHORI]

GRADUATE STUDENT RESEARCHER (GSR) (Dec 2003-Nov 2007)

Berkeley Sensor and Actuator Center (BSAC), University of California, Berkeley, USA

- Development of silicon nanowire based real-time chemical and biological sensors with high sensitivity and detection speed
- Development of novel selective surface functionalization method for silicon nanowires via nanoscale Joule heating of silicon nanowires for the improvement of sensitivity and detection limit
- Development of direct nanoimprinting process of electrically / biologically functional materials (eg. polysaccharide, protein, metal nanoparticles, and quantum dots) for high-throughput, high precision, environment-friendly, and low-cost nanopatterning in bio/nano sensor and flexible electronics applications
- Development of top-down/bottom-up hybrid nanomanufacturing of ZnO nanowire-based field effect transistor (FET) based on metal and semiconductor nanoparticle precursors

RESEARCH ASSISTANT (RA) (Jun 2002-July 2003)

MEMS Research Group, University of Illinois, Urbana-Champaign, USA

- Investigation of mechanical and thermal characteristics of refractory materials (eg. Ta₂O₅, Al₂O₃) at high temperature
- Design of microscale thermal insulation for high-temperature micro-chemical reactor with multi-stack of multi-layer thin-film with low emissivity and high reflectivity
- Study of diffusion kinetics in multi-layer thin-films at high temperature

RESEARCH ASSISTANT (RA) (Dec 1997-Dec 1998)

Telerobotics Laboratory, KAIST, Daejeon, Republic of Korea

- Optimal design of trajectory planning and analyzed vibration characteristics for 4-axis Cartesian linear-motion robot
- Development of fast and precise micro-positioning control structure of 6-dof Stewart-platform parallel manipulator (slave robot) for telerobotic microsurgery system and a real-time bilateral force-position control structure between hand controller (master) and slave robot using C++ in VxWorks real-time OS.

PROFESSIONAL ACTIVITIES & SERVICES (at KAIST)

ACADEMIC SOCIETY MEMBERSHIP

- Member, American Society of Mechanical Engineers (ASME)
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, Material Research Society (MRS)
- Board Member, Korean Society of Mechanical Engineers (KSME)
- Board Member, Korean Society of Precision Engineering (KSPE)
- Board Member, Korean Society of Manufacturing Technology Engineers (KSMTE)

PROFESSIONAL SERVICES

Conference Committee & Session Chairs

- Organizing Committee, The 7th World Congress on Biomimetics, Artificial Muscles and Nano-Bio (BAMN 2013)
- Organizing Committee, The 2nd nano-IMP 2013 Conference
- Technical Program Committee, 1st International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale (3M-NANO), 2011
- Technical Program Committee, 2nd International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale (3M-NANO), 2012
- Organizing Committee & Session Chair, 10th International Conference on Nanoimprint and Nanoprint Technology (NNT 2011), 2011
- Organizing Committee, 2nd Collaborative Conference on Materials Research (CCMR), 2012
- Organizing Committee, Spring Meeting of Korean Society of Mechanical Engineers (Micro/nanotechnology division), 2011
- Organizing Committee and Program Co-chair, 1st KAIST-Harvard Workshop on Nanoscale Reliability, 2011
- Organizing Committee, 1st KAIST-Chulalongkorn University Workshop on Nanotechnology, 2011
- Session Chair, 1st BIT World Congress of Nano S&T, Session #1-13 (Nanosensors and nanoprobes), 2011
- Session Chair, Fall Meeting of Korean Society of Mechanical Engineers (Micro/nanotechnology division), 2011
- Session Chair, Spring Meeting of Korean Society of Mechanical Engineers (Micro/nanotechnology division), 2011
- Session Chair, Spring Meeting of Korean Society of Mechanical Engineers (Micro/nanotechnology division), 2010

- Session Chair, Spring Meeting of Korean Society of Mechanical Engineers (Micro/nanotechnology division), 2009
- Session Chair, Spring Meeting of Korean Society of Manufacturing Technology Engineers, 2011
- Session Chair, Fall Meeting of Korean Society of Manufacturing Technology Engineers, 2011

Journal Reviewer

- Journal of Materials Science
- Journal of Electrochemical Society
- ACS NANO
- Journal of American Chemical Society (JACS)
- Journal of Korean Society of Mechanical Engineers
- Journal of Nanomaterials
- Sensors and Actuators B: Chemical Sensors

Committee for Government Policy and R&D Masterplan

- Committee member, 3rd Korean National Nanotechnology Initiative Plan – Process, Measurement and Equipment Division (Ministry of Knowledge Economy & Ministry of Education, Science and Technology), 2010
- Committee member, Committee for Nano-fusion Community (Nano-Cell) - Energy and Environment Division (Ministry of Knowledge Economy), 2011
- Committee member, Committee for Nano-industry Technology Roadmap – Energy and Environment Division (Ministry of Knowledge Economy & Ministry of Education), 2011

Departmental Service

- Student Affairs Committee (Jan 2009 – Present)
- Graduate Program (MS / Ph.D.) Admissions Committee (Fall 2010, Spring 2011)
- Supervisor for Department Clean Room Facility (Jan 2010-Present)
- Team Leader for Department Website Design & Management (Fall 2009-Present)

University Service

- Steering Committee, KAIST Institute for the NanoCentury (Apr 2009 – Jun 2010)
- Steering Committee, KAIST Presidential Fellowship Program (Oct 2010 – Present)
- Steering Committee, KAIST-LG Display LGenius Program (Dec 2010 – Present)
- Steering Committee, KAIST-KIMM Convergence Program (May 2009 – Present)
- Undergraduate Program Admissions Committee (Spring 2010, 2011, 2012)
- Participating Faculty, KAIST STAR Forum (Jul 2011)
- Review Committee, 2008 Summer / Fall Undergraduate Research Program (URP) (Feb 2009)
- Advisor, Happy College Life Courses (Feb 2011 – Present)

DISSERTATION COMMITTEE (*: my own grad student)

Ph.D. Students

Completed

- Dr. Chun Yan Jin, Ph.D. in Spring 2013 (Committee Chair: Prof. Inkyu Park) *
- Dr. Jae-Hyuk Ahn, Ph.D. in Spring 2013 (Committee Chair: Prof. Yang Kyu Choi)
- Dr. Jeong Oen Lee, Ph.D. in Spring 2013 (Committee Chair: Prof. Joon Bo Yoon)
- Dr. Sun-Rak Kim, Ph.D. in Fall 2012 (Committee Chair: Prof. Joong Don Yoo)
- Dr. Hyoun-Hyang Park, Ph.D. in Fall 2012 (Committee Chair: Prof. Seung-Seob Lee)
- Dr. Jong Su Kim, Ph.D. in Spring 2012 (Committee Chair: Prof. Min Yang Yang)
- Dr. Sung Bum Kim, Ph.D. in Spring 2012 (Committee Chair: Prof. Min Yang Yang)
- Dr. Sechan Yoon, Ph.D. in Spring 2012 (Committee Chair: Prof. Young-Ho Cho)

- Dr. Yoo Mi Kim, Ph.D. in Fall 2011 (Committee Chair: Prof. Joong-Myeon Bae)
- Dr. Suk-Hee Park, Ph.D. in Spring 2011 (Committee Chair: Prof. Dong Yeol Yang)
- Dr. Hyung Cheoul Shim, Ph.D. in Fall 2010 (Committee Chair: Prof. Soo Hyun Kim)

On-going

- Mr. Jaeshin Park (Committee Chair: Prof. Seyoung Im)
- Mr. Sang Hyeok Kim (Committee Chair: Prof. Inkyu Park) *
- Mr. Jung Kim (Committee Chair: Prof. Inkyu Park) *
- Mr. Daejong Yang (Committee Chair: Prof. Inkyu Park) *
- Mr. Hyeon Jin Eom (Committee Chair: Prof. Inkyu Park) *
- Mr. Jung Woo Hong (Committee Chair: Prof. Jennifer H. Shin)
- Ms. Boo Seo Choi (Committee Chair: Prof. Sang Woo Han)

M.S. Students

Completed

- Mr. Jin Ho Yoon, M.S. in Spring 2013 (Committee Chair: Prof. Min Yang Yang)
- Mr. Semin Ryu, Spring 2013 (Committee Chair: Prof. Dong-Soo Kwon)
- Mr. Sung Min Shin, Fall 2012 (Committee Chair: Prof. Joongmyeon Bae)
- Mr. Min Ho Hwang, Fall 2012 (Committee Chair: Prof. Dong Soo Kwon)
- Mr. Wonseok Lee, Fall 2012 (Committee Chair: Prof. Inkyu Park) *
- Mr. Dong Hwan Kim, Spring 2012 (Committee Chair: Prof. Inkyu Park) *
- Mr. Sang Hyeok Kim, Spring 2012 (Committee Chair: Prof. Inkyu Park) *
- Mr. Ji Yong Kim, Spring 2011 (Committee Chair: Prof. Min Yang Yang)
- Mr. Chang Won Lee, Spring 2011 (Committee Chair: Prof. Su Kyung Park)
- Ms. Jung Kim, M.S. in Spring 2011 (Committee Chair: Prof. Inkyu Park) *
- Mr. Jihoon Jeong, M.S. in Spring 2011 (Committee Chair: Prof. Joong-Myeon Bae)
- Mr. Woo Taek Lee, M.S. in Spring 2010 (Committee Chair: Prof. Jennifer H. Shin)
- Ms. Yujin Jeong, M.S. in Spring 2010 (Committee Chair: Prof. Dong Yeol Yang)

On-going

- Mr. Jae-Hwan Lee (Committee Chair: Prof. Inkyu Park) *
- Mr. Jung-Hoon Yoon (Committee Chair: Prof. Inkyu Park) *
- Mr. Gun-Ho Lee (Committee Chair: Prof. Joong-Myeon Bae)
- Mr. Kasyful Fuadi (Committee Chair: Prof. Inkyu Park) *
- Mr. Aekachan Pichitpajongkit (Committee Chair: Prof. Inkyu Park) *
- Mr. Dong Uk Kwon (Committee Chair: Prof. Inkyu Park) *
- Mr. Kyoung Sup Kum (Committee Chair: Prof. Inkyu Park) *
- Mr. Morteza Amjadi (Committee Chair: Prof. Inkyu Park) *

RESEARCH ADVISING

- Ms. Chun Yan Jin (5th year Ph.D. student) : multifunctional nanowire array device
- Mr. Daejong Yang (4th year M.S./Ph.D. student) : flexible & wearable environmental sensing platform
- Ms. Jung Kim (2nd year Ph.D. student) : nanostructure-integrated microfluidic devices
- Ms. Hyeonjin Eom (2nd year Ph.D. student) : nanomaterials for smart window & energy harvesting
- Mr. Sanghyeok Kim (1st year Ph.D. student) : printed electronics of functional nanomaterials
- Mr. Jaehwan Lee (2nd year M.S. student) : flexible and implantable sensors for smart stent device
- Mr. Junghoon Yun (2nd year M.S. student) : multifunctional nanowire array device
- Mr. Kasyful Fuadi (2nd year M.S. student) : hybrid nanostructures for environmental sensing
- Mr. Dong Uk Kwon (1st year M.S. student) : nanostructures for water treatment and microfluidics
- Mr. Aekachan Pichitpajongkit (1st year M.S. student) : nanomaterial-based smart window
- Mr. Dong Uk Kwon (1st year M.S. student) : nanostructure-based bacterial inactivation
- Mr. Kyoung Sup Kum (1st year M.S. student) : nanomaterial bonding and integration

- Mr. Morteza Amjadi (1st year Ph.D. student): mechanical behavior of nanomaterials

RESEARCH GRANTS AWARDED

COMPLETED PROJECTS

- PI, “Development of multifunctional and integrated nanosystem technology & application to bio & environment systems” funded by KAIST, 2009.1.-2011.12.31. (KRW 250,000,000)
- PI, “Development of key technologies for flying robots for surveillance, reconnaissance, and defenses” funded by KAIST Institute of Design of Complex Systems, 2009.1. - 2009.12. (KRW 23,250,000)
- PI, “Development of eco-friendly hybrid nanomanufacturing technology and its applications in the ubiquitous network of real-time environment sensors” funded by KAIST Institute of NanoCentury, 2009.1.-2009.12. (KRW 30,000,000)
- PI, “Development of high efficiency, biofuel-compatible, low temperature μ -SOFC based on three dimensional nanostructure network” funded by KAIST Institute of EcoEnergy Systems, 2010.1.-2010.12 (KRW 42,000,000)
- PI, “Development of TiO₂ nanostructure-based high performance environmental monitoring device” funded by Kyungsang nam-do Province, 2010.1.-2010.12. (KRW 35,000,000)
- PI, “Development of hybrid nanomanufacturing technology and applications in the real-time environment sensor devices” funded by National Research Foundation, 2009.5. - 2012.4. (KRW 50,400,000/yr \times 3yrs)
- PI, “Eco-friendly Hybrid Nanomanufacturing for Intelligent Environment Sensing Applications” funded by Hewlett Packard Company (USA), 2009.8-2012.7. (US\$ 75,000/yr \times 3yrs)
- PI, “Multiplexed nanostructure-based sensor array platform for chemical analysis” funded by KAIST, 2011.7.-2011.12. (KRW 10,000,000)

ACTIVE PROJECTS

- PI, “Development of multifunctional high density nanowire array devices and their bio & environment applications” funded by National Research Foundation, 2010.6.-2013.5. (KRW 59,995,000/yr \times 3yrs)
- Co-PI, “Technology of nano-composite ceramics for solid oxide energy conversion” funded by Ministry of Knowledge Economy, 2010. 6 – 2013. 5. (KRW 40,000,000/yr \times 3yrs)
- Co-PI, “Core research for reliability analysis and improvement of printed electronics fabrication process with functional nanomaterials” funded by National Research Foundation, 2010.9.-2013.8. (KRW 80,000,000/yr \times 3yrs)
- Co-PI, “Integrated functional materials for smart sensing and actuation of active stents” funded by Ministry of Knowledge Economy, 2011.6.-2013.5. (KRW 40,000,000/yr \times 2yrs)
- Co-PI, “Smart IT Fusion System (Global Frontier Program)” funded by National Research Foundation, 2011.10.-2020.8. (KRW 130,000,000/yr \times 9yrs)
- Co-PI, “Medical sensors in smart needles for advanced intervention technology” funded by Ministry of Knowledge Economy, 2012.6-2015.5. (KRW 90,000,000/yr \times 3yrs)
- Co-PI, “Development of metal nanoparticle-based filler and localized nanostructure bonding for the nanostructure integration” funded by National Research Foundation, 2012.6.-2015.5. (KRW 70,000,000/yr \times 3yrs)
- Co-PI, “Development of nanostructure-based surface plasmon resonance (SPR) technology), 2013.6.-2013.5. (KRW 50,000,000/yr \times 3yrs)

**** Total annual research grant (as of Dec 2012): KRW 559,995,000 /yr (US\$516,875/yr)***

PUBLICATIONS

INTERNATIONAL JOURNAL PUBLICATIONS (SCI) *IF=impact factor; CT=citations

* Total citations=511; h-index=10 (as of Mar 7, 2013)

Articles published or accepted

1. S. Kim, S. Won, G-D. Sim, I. Park, and S-B. Lee, "Tensile characteristics of metal nanoparticle films on flexible polymer substrates for printed electronics applications", *Nanotechnology*, Vol. 24, 085701, Mar 2013 **IF=3.979**
2. I. Park, "Nanotechnology for advanced automotive system (review article)", *Auto Journal*, Vol. 34, 30-30, Oct 2012 (domestic: Korean journal)
3. W.S. Lee, J-H. Choi, I. Park, and J.H. Lee, "Room-temperature compressive transfer printing of nanowires for nanoelectronic devices", *Langmuir*, Vol. 28, 17851, Dec 2012 **IF=4.186**
4. I. Lee, S. Kim, J. Yun, I. Park, and T-S. Kim, "Interfacial toughening of solution processed Ag nanoparticle thin films by organic residuals", *Nanotechnology*, Vol. 23, 485704, Dec 2012 **IF=3.979**
5. S. Kim, W. S. Lee, J. Lee, and I. Park, "Direct micro/nano metal patterning based on two-step transfer printing of ionic metal nano-ink", *Nanotechnology*, Vol. 23, 285301, Jun 2012 **IF=3.979**
6. B-S. Choi, Y. W. Lee, S. W. Kang, J. W. Hong, J. Kim, I. Park, and S-W. Han, "Multi-Metallic Alloy Nanotubes with Nanoporous Framework", *ACS Nano*, Vol. 6, 5659-5667, May 2012 **IF=11.421**
7. Jung Kim, Jung Woo Hong, Dong Pyo Kim, Jennifer H. Shin, and Inkyu Park, "Nanowire-integrated microfluidic devices for facile and reagent-free mechanical cell lysis", *Lab on a Chip*, Vol. 12, 2914-2921, May 2012 **IF= 5.67 CT=2**
8. W.S. Lee, S. Won, J. Park, J. Lee, and I. Park, "Thermo-compressive transfer printing for facile alignment and robust device integration of nanowires", *Nanoscale*, Vol. 4, 3444-3449, Mar 2012 **IF=5.914 CT=2**
9. S. Choi, **I. Park**, Z. Hao, H-Y. Holman, and A. P. Pisano, "Quantitative studies of long-term stable, top-down fabricated silicon nanowire pH sensors", *Applied Physics A*, Vol. 107, 421-428, May 2012 **IF=1.63 CT=3**
10. M. Lim, D. Kim, C-O. Park, Y. Lee, S-W. Han, Z. Li, R.S. Williams, and **I. Park**, "A new route towards ultra-sensitive, flexible chemical sensors: metal nanotubes by wet-chemical synthesis along sacrificial nanowire templates", *ACS Nano*, Vol. 6, 598-608, Jan 2012 **IF= 11.421 CT=9**
11. C-Y. Jin, Z. Li, R.S. Williams, K-C. Lee, and **I. Park**, "Localized temperature and chemical reaction control in nanoscale space by nanowire array", *Nano Letters*, Vol. 11, 4818-4825, Nov 2011 **IF=12.186 CT=3**
12. J. Kim, Z. Li, and **I. Park**, "Direct synthesis and integration of functional nanostructures in microfluidic devices", *Lab on a Chip*, Vol. 11, 1946-1951, Jun 2011 **IF=6.26 CT=7**
13. Y. Lee, M. Lim, **I. Park**, and **S-W. Han**, "Facile Synthesis of noble metal nanotubes by using ZnO nanowires as sacrificial scaffolds and their electrocatalytic properties", *Chemical Communications*, Vol. 47, 6299-6301, Apr 2011. **IF=5.787 CT=6**
14. G-D. Sim, S. Won, C-Y. Jin, **I. Park**, S-B. Lee, and **J. J. Vlassak**, "Acrylic primer coating for optimized stretchability of as-deposited Ag on PET substrate", *Journal of Applied Physics*, Vol. 109, 073511, Apr 2011. **IF=2.064 CT=3**
15. M. Lim, Y. Lee, **S-W. Han**, and **I. Park**, "Novel fabrication method of diverse one-dimensional Pt/ZnO hybrid nanostructures and its sensor application", *Nanotechnology*, Vol. 22, 035601, Jan 2011. **IF=3.644, CT=8**

16. **I. Park**, Z. Li, A. P. Pisano, and R.S. Williams, "Top-down fabricated silicon nanowire sensor for real-time chemical detection", *Nanotechnology*, Vol. 21, 015501, Jan 2010. **IF=3.644, CT=33**
17. **S. Choi, I. Park**, Z. Hao, H-Y N. Holman, A. P. Pisano, and T. I. Zohdi, "Ultra-Fast Self-Assembly of Micro-Scale Particles by Open-Channel Flow", *Langmuir*, Vol. 26, 4661-4667, Nov 2009. **IF=4.268, CT=7**
18. E-U. Kim, K-J Baeg, D-Y Kim, Y-Y Noh, D-Y. Kim, T. Lee, **I. Park**, and **G-Y. Jung**, "Templated assembly of metal nanoparticles in nanoimprinted patters for metal nanowire fabrication", *Nanotechnology*, Vol. 20, 355302, Aug 2009. **IF=3.644, CT=8**
19. W. Wu, W. M. Tong, J. Bartman, Y. Chen, R. Walmsley, Z. Yu, Q. Xia, **I. Park**, C. Picciotto, J. Gao, S-Y. Wang, D. Morecroft, J. Yang, K. K. Berggren, and **R. S. Williams**, "Sub-10 nm Nanoimprint Lithography by Wafer Bowing", *Nano Letters*, Vol. 8, 3865-3869, Oct 2008. **IF=12.186, CT=33**
20. S-H. Ko, **I. Park**, H. Pan, N. Misra, M.S. Rogers, A.P. Pisano, and **C. P. Grigoropoulos**, "ZnO nanowire network transistor fabrication on a polymer substrate by low-temperature, all-inorganic nanoparticles solution process", *Applied Physics Letters*, Vol. 92, 154102, Apr 2008. **IF=3.820, CT=49**
21. **I. Park**, S-H. Ko, H.Pan, E-S. Lee, J-H. Jeong, **A.P. Pisano**, **C.P. Grigoropoulos**, and J.M.J. Fréchet, "Nanoscale electronics on flexible substrate by direct nanoimprinting of metallic nanoparticles", *Advanced Materials*, Vol. 20, 489-496, Feb 2008 [Highlighted as hot topic in *Advances in Advance*]. **IF=10.857, CT=58**
22. **I. Park**, Z. Li, A.P. Pisano, and R.S. Williams, "Selective surface functionalization of silicon nanowires via nanoscale Joule heating", *Nano Letters*, Vol. 7, No. 10, 3106-3111, Oct 2007 [Highlighted in *Nature Nanotechnology*]. **IF=12.186, CT=38**
23. **I. Park***, S-H. Ko*, H. Pan, **C.P. Grigoropoulos**, A.P. Pisano, C. K. Luscombe, and J. M. J. Fréchet, "Direct nanoimprinting of metal nanoparticles for low temperature nanoelectronic fabrication", *Nano Letters*, Vol. 7, No. 7, 1869-1877, Jul 2007 [Highlighted in *Nature Nanotechnology*]. **IF=12.186, CT=102** (* equal contribution)
24. **I. Park**, J. Cheng, A.P. Pisano, E-S. Lee, and J-H. Jeong, "Low temperature, low pressure nanoimprinting of chitosan as a biomaterial for bio-nano technology applications", *Applied Physics Letters*, Vol. 90, No.2, 093902, Feb 2007 [Featured also in *Virtual Journal of Biological Physics Research* Vol 13, No 5]. **IF=3.820, CT=23**
25. **I. Park**, Z. Li, X. Li, A.P. Pisano, and R. S. Williams, "Towards silicon nanowire-based biochemical sensors for intracellular detection", *Biosensors and Bioelectronics*, Vol. 22, No. 9-10, 2054-2070, Apr 2007. **IF=5.361, CT=50**
26. J. Gao, C. Picciotto, W. Wu, **I. Park**, and **W. Tong**, "nDSE-based overlay alignment: enabling technology for nanometrology and fabrication", *Proceedings of SPIE – The International Society for Optical Engineering (Metrology, Inspection, and Process Control for Microlithography*, Chas N. Archie, eds.), 6152, 1-13, Mar 2006. **IF=0.658, CT=1**
27. R. Chandrasekharan, **I. Park**, R.I. Masel, and **M.A. Shannon**, "Thermal oxidation of tantalum films at various oxidation states from 300 to 700°C", *Journal of Applied Physics*, Vol. 98, 114908, Dec 2005. **IF=2.064, CT=3**

Articles in review

28. H. Eom, J-Y. Jung, Y. Shin, S. Kim, J-H. Choi, E. Lee, J-H. Jeong, and I. Park, " Large-scale Ag/TiO₂ open core-shell nanowire arrays with enhanced plasmonic photocatalytic effects", *Nano Letters*, in review

Articles in preparation

29. D. Kim, M. Lim, Z. Li, R.S. Williams, C-O. Park, and **I. Park**, "Novel approach to ultra-sensitive chemical detection: in-situ integration and surface modification of functional nanomaterials by localized heating", in preparation (to *Nano Letters*)
30. **I. Park**, D. Yang, D. Kim, J. Kim, S-H. Ko, Z. Li, and R.S. Williams, "Eco-friendly direct integration of nanodevices by focused energy field (FEF) method", in preparation (to *Nature Nanotechnology*)
31. D. Yang, J. Lee, J-H. Kim, and **I. Park**, "Bendable and stretchable photonic sensor on flexible substrate based on locally synthesized nanowire network", in preparation (to *ACS NANO*)
32. D. Kim, Z. Li, R. S. Williams, C-O. Park, and **I. Park**, "Flexible, light-weight, mechanically robust, and highly sensitive chemical sensors", in preparation (to *Small*)
33. C-Y. Jin, J.H. Yoon, K-C. Lee, Z. Li, and I. Park, "Nanoscale synthesis and modification of one dimension nanostructures by using nanowire heater array", in preparation (to *Applied Physics Letters*)
34. J-H. Lee, S. Kim, D. Yang, and I. Park, "Stretchable and flexible strain sensors for human motion detection", in preparation (to *Nano Letters*)
35. K. Fuadi, D. Yang, B. Yulianto, and I. Park, "Chemical sensors based on CuO nanostructures and CuO-ZnO hetero-nanostructures", in preparation (to *Small*)
36. J. Kim, J-K. Park, and I. Park, "Nanowire-based immunoassay", in preparation (to *Biosensors and Bioelectronics*)
37. J.H. Yoon, C-Y. Jin, S. Jeon, and I. Park, "Localized surface modification of silicon nanowires with metal nanoparticles for enhanced hydrogen detection", in preparation (to *Applied Physics Letters*)

CONFERENCE PROCEEDINGS & PRESENTATIONS

International Conferences

1. **I. Park**, D.J. Hwang, A. P. Pisano, and C. P. Grigoropoulos, "Planar off-chip microelectrode for electrophysiological measurement of small biological cells", Proceedings of 3rd International IEEE-EMBS Special Topics Conference on Microtechnologies in Medicine and Biology, Hawaii, USA., May 2005
2. J. Gao, C. Picciotto, W. Wu, **I. Park**, and **W. Tong**, "nDSE-based overlay alignment: enabling technology for nanometrology and fabrication", Proceedings of SPIE Symposium on Microlithography, San Jose, USA., Feb 2006
3. **I. Park**, Z. Li, X. Li, A.P. Pisano, and R. S. Williams, "Silicon nanowire-based biochemical sensors for intracellular detection", Proceedings of Biosensors 2006, Toronto, Canada, May 2006
4. **I. Park**, Z. Li, and A.P. Pisano, "Selective functionalization of silicon micro/nanowire sensors via localized Joule heating", Proceedings of 2nd International Conference on Nano-micro Engineered and Molecular Systems (IEEE-NEMS 2007), Bangkok, Thailand, Jan 2007
5. W. Wu, W. M. Tong, J. Bartman, Y. Chen, Z. Yu, D. Stewart, **I. Park**, C. Picciotto, J. Gao, R. Walmsley, S-Y. Wang, and **R. S. Williams**, "A cost-effective nanoimprint lithography module", Proceedings of the International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN) 2007, Denver, CO, USA, May 2007
6. S-H. Ko, **I. Park**, H. Pan, **C.P. Grigoropoulos**, and A.P. Pisano, "Low temperature OFET (organic field effect transistor) fabrication by metal nanoparticle imprinting", Proceedings of ASME-JSME Thermal Engineering and Summer Heat Transfer Conference, Vancouver, BC, Canada, Jul 2007

7. **I. Park**, Z. Li, A. P. Pisano, and R.S. Williams, "Silicon nanowire array as a biochemical sensor / nano-heater and its potential applications in cellular protein detection", Proceedings of MicroTAS 2007, Paris, France, Oct 2007
8. **I. Park**, Z. Li, A.P. Pisano, and R.S. Williams, "Nanoscale Joule heating along silicon nanowire and its nanoscale heater application", Proceedings of ASME International Mechanical Engineering Congress and Exposition (IMECE) 2007, Seattle, Washington, Nov 2007
9. **I. Park**, S.H. Ko, A. P. Pisano, and C. Grigoropoulos, "Micro/nanoscale structure definition with metal and semiconductor nanoparticles by direct nanoimprinting for electronic applications", Proceedings of ASME International Mechanical Engineering Congress and Exposition (IMECE) 2007, Seattle, Washington, Nov 2007 (**Best Poster Award at ASME MICRO/NANO Forum**)
10. W. Wu, W. M. Tong, J. Bartman, Y. Chen, R. Walmsley, Z. Yu, D. Stewart, **I. Park**, C. Picciotto, J. Gao, S-Y. Wang, and **R. S. Williams**, "A cost-effective nanoimprint lithography module", Proceedings of SPIE Advanced Lithography, San Jose, California, Feb 2008 (**invited**)
11. **I. Park**, S.H. Ko, S. Choi, C.P. Grigoropoulos, and A. P. Pisano, "Controlled growth of metal oxide nanowires via nanoimprinting-based patterning of nanoparticle seeds", The 7th International Conference on Nanoimprint and Nanoprint Technology (NNT 2008), Oct 2008, Kyoto, Japan
12. **S. Choi**, **I. Park**, A.P. Pisano, "A novel analytical model for thermoplastic deformation of resist in thermal nanoimprint", The 7th International Conference on Nanoimprint and Nanoprint Technology (NNT 2008), Oct 2008, Kyoto, Japan
13. **I. Park**, S-H. Ko, Z. Li, A.P. Pisano, and C. P. Grigoropoulos, "Multifunctional nanowire array for chemical sensing and manipulation", Transducers 2009, Jun 2009, Denver, CO, USA
14. **I. Park**, S-H. Ko, S. Choi, A. P. Pisano, and C. P. Grigoropoulos, "Localized synthesis of metal oxide nanowires", Materials Research Society (MRS) Spring 2009 Meeting, Apr 2009, San Francisco, CA, USA
15. **I. Park**, S-H. Ko, H. Pan, A. P. Pisano, and C. P. Grigoropoulos, "Nanoscale patterning and electronics on flexible substrate by direct nanoimprinting of metallic nanoparticles", Materials Research Society (MRS) Spring 2009 Meeting, Apr 2009, San Francisco, CA, USA
16. **S. Choi**, **I. Park**, and A. P. Pisano, "Self-assembled ultra-thin silica layers for on-chip chromatography", Materials Research Society (MRS) Spring 2009 Meeting, Apr 2009, San Francisco, CA, USA
17. S-H. Ko, **I. Park**, H. Park, N. Misra, and **C.P. Grigoropoulos**, "Low-temperature, all-inorganic nanoparticle solution process for ZnO nanowire network transistor fabrication on a polymer substrate", 2009 ASME Summer Heat Transfer Conference, Jul 2009, San Francisco, CA, USA
18. **I. Park**, S-H. Ko, J. Kim, J-H. Yu, C. P. Grigoropoulos, A. P. Pisano, "Templated assembly of functional nanomaterials - direct nanoimprinting process", The 2nd Asian Symposium on Nanoimprint Lithography (ASNIL), Oct 2009, Taipei, Taiwan (**invited**)
19. **I. Park**, "Nanomanufacturing technology for multifunctional nanodevices", 7th Korea-US Joint Symposium: MEMS and Bioengineering, Sep 2009, Daejeon, Korea (**invited**)
20. D. Yang, S-H. Ko, Z. Li and **I. Park**, "Eco-friendly nanofabrication process for integrated nanostructures and its applications in photonic and environment sensors", Nano Tech 2010 International Nanotechnology Exhibition & Conference, Feb 2010, Tokyo, Japan
21. **I. Park**, S-H. Ko, and Z. Li, "Localized synthesis and integration of nanostructures via focused energy field (FEF) method", Materials Research Society Spring 2010 Meeting, Apr 2010, San Francisco, USA
22. D. Yang and **I. Park**, "Flexible photonic sensor based on locally synthesized metal oxide nanowire network", IEEE NANO 2010 Conference, Aug 2010, Ilsan, Korea (**Best Paper Award**)
23. S. Kim and **I. Park**, "Direct metal patterning by two-step transfer printing of conductive metal nano-inks", IEEE NANO 2010 Conference, Aug 2010, Ilsan, Korea

24. J. Kim and **I. Park**, "In-situ zinc oxide nanowire array synthesis in the microchannel for microfluidic devices", IEEE NANO 2010 Conference, Aug 2010, Ilsan, Korea
25. J. Kim and **I. Park**, "Facile and controlled integration of functional nanostructures in microfluidic chip", microTAS 2010, Oct 2010, Groningen, Netherlands
26. S. Kim and **I. Park**, "Two transfer printing of wet nanomaterial inks for electronics applications", MRS Spring 2011, San Francisco, USA
27. M-A. Lim, Y-W. Lee, S-W. Han, and **I. Park**, "Facile route to the synthesis of metal-metal oxide hybrid nanostructures", MRS Spring 2011, San Francisco, USA
28. M. A. Lim, D. Kim, C-O. Park, Z. Li, and **I. Park**, "Hydrogen sensor based on palladium nanotube arrays fabricated by novel low-temperature hydrothermal synthesis", Transducers 2011, June 5-9, Beijing, China
29. D. Kim, M.A. Lim, Daejong Yang, Z. Li, J-O. Park, and **I. Park**, "Locally synthesized metal oxide nanowire-device and their gas sensing applications", Transducer 2011, June 5-9, Beijing, China
30. **I. Park**, "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", International Symposium on Microchemistry and Microsystems (ISMM) ,2011, Seoul, Korea (**invited**)
31. J. Kim, J.W. Hong, Z. Li, J.H. Shin and **I. Park**, "In-situ synthesized and patterned nanowire arrays in microfluidic channel for particle trapping and cell lysis applications", microTAS 2011, Oct 2011, Seattle, USA
32. C. Y. Jin, Z. Li, R. S. Williams, K. C. Lee, and **I. Park**, "Nanoscale localized and selective chemical reaction control through Joule heating of individually addressable nanowires", Nano Today Conference 2011, Dec 11-15, Hawaii, USA
33. D. Yang, J. H. Lee, Z. Li, J-H. Kim, J. M. Park, **I. Park**, "Bendable and stretchable photonic sensor based on zinc oxide nanowires fabricated by novel direct integration method", Nano Today Conference 2011, Dec 11-15, Hawaii, USA
34. W.S. Lee, **I. Park**, J.H. Lee, "Thermocompression transfer printing process for improved bonding between nanowires and metal electrodes", NNT 2011, Oct 2011, Jeju, Korea
35. S. Kim and **I. Park**, "Direct micro/nano-printing by two-step transfer process for metal nano-inks", NNT 2011, Oct 2011, Jeju, Korea
36. **I. Park**, "One dimensional nanostructures for intelligent and low-power environment sensing", 1st Annual World Congress of Nano S&T, Dalian, China, Oct 2011 (**invited**)
37. D. Kim, M. Lim, Z. Li, C-O. Park, and **I. Park**, "Ultra-sensitive, low-power and flexible H₂S sensors based on palladium nanoparticle-coated metal oxide nanowires", 25th International Conference on Micro Electro Mechanical Systems, Paris, France, Jan 2012
38. C.Y. Li, Z. Li, R.S. Williams, K-C. Lee, and **I. Park**, "Localized temperature and chemical reaction control in nanoscale space by nanowire array", The 3rd ASME Micro/Nanoscale Heat & Mass Transfer Conference, March 2012, Atlanta, GA, USA
39. W.S. Lee, **I. Park**, J.H. Lee, "Novel method for robust bonding and alignment of nanowires on electrodes", 2012 MRS Spring Meeting, Apr 2012, San Francisco, CA, USA
40. **I. Park**, D. Yang, D. Kim, Y-W. Lee, S-W. Han, and Z. Li, "Hybrid nanofabrication for multifunctional nanowire sensor applications", The 14th International Meeting on Chemical Sensors (IMCS), May 2012, Nuremberg, Germany (**invited**)
41. J.H. Lee, W.S. Lee, **I. Park**, J. Park, "Easy chemical-free alignment and integration of nanowires on device platform at room temperature", 2012 EMRS Spring Meeting, May 2012, France
42. J. Kim, J.W. Hong, Y-W. Lee, B-S. Choi, D.P. Kim, J.H. Shin, S-W. Han, and **I. Park**, "Nanomaterial-integrated microfluidic devices for cell diagnosis and biochemical assay", Global Congress on Nanomedicine 2012, Sep 2012, Songdo, Korea (**invited**)
43. J. Kim, J.W. Hong, D.P. Kim, J.H. Shin, and **I. Park**, "Nanostructure-integrated microfluidics for chemical and biological applications", The 3rd Japan-China-Korea Joint Conference on MEMS/NEMS, Sep 2012, Shanghai, China

44. J. Kim, J.W. Hong, D.P. Kim, J.H. Shin, and **I. Park**, "Fabrication of nanostructure-integrated microfluidic devices for BioMEMS applications", International Conference of Manufacturing Technology Engineers 2012, Oct 2012, Seoul, Korea
45. D. Yang, D. Kim and **I. Park**, "Low-temperature, Wet-chemical Route to the Selective and Direct Integration of TiO₂ Nanotubes via Thermal-driven and Template-based Reactions and Applications to Ambient Light Sensors", 2012 MRS Fall Meeting, Nov 2012, Boston, MA, USA
46. K. Fuadi, D. Yang, **I. Park**, and C-O. Park, "Nanostructured Metal Oxide for H₂S Gas Sensing Application at Room Temperature", Materials Research Society (MRS) Fall 2012 Meeting, Nov 2012, Boston, USA
47. S. Kim, S. Won, I. Lee, T.S. Kim, S.B Lee, and **I. Park**, "Adhesion and tensile characteristics of solution-processed Ag nanoparticle thin films", 2012 MRS Fall Meeting , Nov 2012, Boston, USA
48. J. H. Lee, D. Yang, S. Kim, and **I. Park**, "Mechanical/Electrical Behavior of Patterned Metal Nanoparticle-based Thin Film and Flexible Pressure Sensor Applications", 2012 MRS Fall Meeting , Nov 2012, Boston, MA, USA

Domestic Conferences (Korea)

1. **I. Park**, S-H. Ko, A. P. Pisano, C. P. Grigoropoulos, and Z. Li, "Selected synthesis and integration of metal oxide nanostructures on microdevices via localized hydrothermal reaction", 11th Korea MEMS Conference 2009, Apr 2009, Jeju
2. **I. Park**, S-H. Ko, A.P. Pisano, C. P. Grigoropoulos, and Z. Li, "Localized Synthesis and integration of metal oxide nanostructures based on hybrid nanofabrication process and its sensor application", Spring Meeting 2009, Korean Society of Mechanical Engineers, May 2009, Seoul
3. **I. Park**, "Nanomanufacturing technology for the multifunctional nanodevice applications", Nano Korea Symposium 2009, Aug 2009, Ilsan (**invited**)
4. S-H. Ko and **I. Park**, "Flexible electronics by direct nanoimprinting of nanoparticles", Fall Meeting 2009, Korean Society of Precision Engineering, Oct 2009, Daegu
5. **I. Park**, "Multifunctional nanowire array for the biochemical sensing and manipulation", Fall Meeting 2009, Korean Society of Mechanical Engineers, Nov 2009, Yong Pyung (**invited**)
6. D. Yang, C-O. Park, and **I. Park** "H₂ and NO₂ gas sensor using selectively synthesized and integrated metal oxide nanostructure via localized hydrothermal reaction", 12th Korea MEMS Conference, Apr 2010, Busan
7. **I. Park**, "Top-down/bottom-up hybrid nanofabrication of multifunctional nanowire devices", Korean Chemistry Society, Apr 2010, Incheon (**invited**)
8. D. Yang and **I. Park**, "Flexible photonic sensor based on locally synthesized metal oxide nanowire network)", Spring Meeting 2010, Korean Society of Mechanical Engineers, May 2010, Daejeon
9. S. Kim and **I. Park**, "Direct metal patterning by two-step transfer printing of conductive metal nano-inks", Spring Meeting 2010, Korean Society of Mechanical Engineers, May 2010, Daejeon
10. J. Kim and **I. Park**, "In-situ synthesis and integration of nanowires in microfluidic channel", Spring Meeting 2010, Korean Society of Mechanical Engineers, May 2010, Daejeon
11. S. Kim and **I. Park**, "Two-step transfer printing of metal nano-inks for printed flexible electronics fabrication", 13th Korea MEMS Conference, Apr 2011, Jeju
12. D. Yang, J. Lee, Z. Li, J-H. Kim, and **I. Park**, "Zinc oxide nanowire-based flexible photonic sensor fabricated by novel direct integration method and its integration method and its mechanical robustness characterization", 13th Korea MEMS Conference, Apr 2011, Jeju
13. J. Kim, Z. Li, and **I. Park**, "Direct synthesis and integration of ZnO nanowires in microfluidic devices", 13th Korea MEMS Conference, Apr 2011, Jeju

14. C-Y. Jin, Z. Li, R.S. Williams, K-C. Lee, and **I. Park**, "Individually addressable nanowire array for nanoscale localized heating and chemical reaction control", 13th Korea MEMS Conference, Apr 2011, Jeju
15. D. Kim, M. Lim, C-O. Park, and **I. Park**, "Intrinsic and Pt nanoparticle-coated ZnO nanowire devices based on focused thermal energy and their H₂ gas sensing applications", 13th Korea MEMS Conference, Apr 2011, Jeju
16. D. Kim, M. Lim, D. Yang, Z. Li, C-O. Park, and **I. Park**, "Local synthesis of Pt/ZnO hybrid nanostructures for chemical sensing applications", Spring Meeting 2011, Korean Society of Manufacturing Technology Engineers, Apr 2011, Jeju
17. D. Yang, J. Lee, Z. Li, J-H. Kim, and **I. Park**, "ZnO nanowire photonic sensor on flexible film made by localized hydrothermal synthesis method and its sensing characteristics under bending and tensile conditions", Spring Meeting 2011, Korean Society of Mechanical Engineers, May 2011, Busan
18. I. Lee, S-H. Kim, J-H. Yoon, **I. Park**, and **T. Kim**, "Bonding reliability of silver nanoparticles", Fall Meeting 2011, Korean Society of Precision Engineering, Oct 2011, Kyungju
19. **I. Park**, D. Kim, D. Yang, M.A. Lim, and J. Lee, "Nanomaterial-based flexible environmental sensors", Fall Meeting 2011, Korean Society of Manufacturing Technology Engineers, Oct 2011, Daejeon
20. J. Kim, J-W. Hong, Z. Li, J.H. Shin, and **I. Park**, "In-situ synthesized and patterned nanowire arrays in microfluidic channel for cell lysis applications", Fall Meeting 2011, Korean Society of Mechanical Engineers, Nov 2011, Daegu
21. D. Yang, J. Lee, Z. Li, J-H. Kim, J. Park, and **I. Park**, "Flexible ZnO nanowire photonic sensor and its mechanical robustness", Fall Meeting 2011, Korean Society of Mechanical Engineers, Nov 2011, Daegu
22. D. Kim, M. Lim, C-O. Park, and **I. Park**, "A highly sensitive and flexible nanowire-sensor based on localized thermal energy for toxic gas applications", Fall Meeting 2011, Korean Society of Mechanical Engineers, Nov 2011, Daegu
23. **I. Park**, D. Kim, and M. Lim, "Nanomaterial-based environmental monitoring device technology", Annual Meeting of Korean Sensors Society, Nov 2011, Daejeon (**invited**)
24. 이원석, 박인규, 이지혜, "열압착 공정을 통해 형성된 나노와이어와 금속전극간의 기계적/전기적 접촉특성 분석", 한국진공학회 2012, Feb 2012, 강원도
25. 김상혁, 이원석, 박인규, "금속 나노 잉크의 직접 패터닝 및 자외선 센서 전극으로의 활용", KMEMS 2012, Apr 2012, 제주
26. 양대중, 김동환, 박인규, "국소/저온 용액공정으로 합성된 이산화타이타늄 나노튜브 기반 가시광센서", KMEMS 2012, Apr 2012, 제주
27. 이재환, 양대중, 김상혁, 박인규, "단일 스텝 전사 공정을 이용하여 PDMS 기판에 패터닝된 금속 나노 잉크 기반 유연 압력센서", KMEMS 2012, Apr 2012, 제주
28. 이원석, 원세정, 박인규, 이지혜, "저온/저압 열압착 접합에 기반한 기계적으로 강인한 나노와이어 접합 공정", KMEMS 2012, Apr 2012, 제주
29. 이원석, 원세정, 박정희, 이지혜, 박인규, "열압착 공정에 기반한 나노와이어 병렬 접합 기술", 2012 한국생산제조시스템학회, Apr 2012, 제주도
30. 엄현진, 정준호, 박인규, "Photo catalytic approach of Ag/TiO₂ core shell nano-wire array structure", 대한기계학회 춘계 학술대회, May 2012, 대전
31. 김상혁, 이인화, 윤정훈, 김택수, 박인규, "용액공정 기반 은 나노입자 박막의 유기 잔여물에 의한 계면 접합 강화", 대한기계학회 춘계 학술대회, May 2012, 대전
32. 이재환, 양대중, 김상혁, 박인규, "패터닝된 은 나노입자 박막을 이용한 유연 압력 센서", 대한기계학회 춘계 학술대회, May 2012, 대전

33. 이원석, 박인규, 이지혜, "A novel method for simultaneous aligning and bonding of nanowires onto metal electrodes", 2012 대한기계학회 춘계 학술대회, May 2012, 대전
34. 윤정훈, 김춘연, 박인규, "줄 가열을 이용한 실리콘 나노와이어 어레이의 선택적 표면 개질법", 대한기계학회 추계 학술대회, Nov 2012, 창원
35. 양대중, 김동환, 박인규, "국소적으로 합성된 이산화타이타늄의 결합 조절을 이용한 가시광센서", 대한기계학회 추계 학술대회, Nov 2012, 창원

PATENTS

International (USA)

1. W. Wu, S-Y. Wang, D. R. Stewart, R. S. Williams, Z. Yu, and **I. Park**, "Contact Lithography Apparatus and Method", US Patent (*Registration Number: US 7,768,628 B2*), 2010
2. R. G. Walmsley and **I. Park**, "Alignment for Contact Lithography", US Patent (*Application Number: US 2008-0089470 A1*), 2008
3. I. Park and **S.H. Ko**, "Method for manufacturing nanostructure and nanostructure manufactured by the same", US Patent (*Application Number: US 2011-0008245 A1*), 2011

Domestic (Korea)

1. **I. Park** and S.H. Ko, "A method for manufacturing nanostructure, nanostructure manufactured by the same, apparatus for the same, and gas, UV sensor comprising the same", Korea Patent (*Application Number: 2009-0061510*), 2009
2. S.H. Ko and **I. Park**, "A method for manufacturing nanostructure, nanostructure manufactured by the same, apparatus for manufacturing the same", Korea Patent (*Application Number: 2010-0013750*), 2010
3. S-W. Ha, **I. Park**, M. Lim, and Y. Lee, "Method for manufacturing metal nanotube and metal nanotube manufactured by the same", Korea Patent (*Application Number: 2010-0011340*), 2010
4. **I. Park** and D. Yang, "Nanowire optical sensor, flexible nanowire optical sensor and manufacturing method for the same", Korea Patent (*Application Number: 2011-0014498*), 2011
5. **I. Park** and J. Kim, "Method for manufacturing nanowire in microfluidic channel, nanowire manufactured by the same, and microfluidic channel comprising the same", Korea Patent (*Application Number: 2011-0014499*), 2011
6. **I. Park** and C-Y. Jin, "Nanoheater comprising nanowire array device and application using the same", Korea Patent (*Application Number: 2011-0016823*), 2011

INVITED TALKS

International

1. "Microelectrode array for cell membrane potential measurement of individual live cells", Hewlett-Packard Laboratories, Palo Alto, Apr 2005
2. "Biochemical sensing using field effects on silicon nanowires", Industrial Advisory Board Meeting, Berkeley Sensor and Actuator Center (BSAC), Mar 2007
3. "Silicon nanowire (SiNW)-based biochemical sensing and selective surface functionalization of the SiNW", Berkeley Nanosensor Club, Mar 2007
4. "Nanoscale patterning of biologically and electrically functional materials by direct nanoimprinting", Electrical Engineering Department, University of Washington, Nov 2007
5. "Nanoscale patterning of biologically and electrically functional materials by direct nanoimprinting" at Hewlett-Packard Laboratories, Palo Alto, Jan 2008

6. "Silicon Nanowire-Based Biochemical Sensors" at Industrial Advisory Board Meeting, Berkeley Sensor and Actuator Center (BSAC), Mar 2008
7. "Multifunctional nanowire devices for bio/chemical sensing, manipulation, and control", Mechanical Engineering Department, University of Michigan at Ann Arbor, Apr 2008
8. "Multifunctional nanowire devices for bio/chemical sensing and manipulation", Mechanical Engineering Department, Virginia Tech, Apr 2008
9. "Multifunctional nanowire devices for bio/chemical sensing and manipulation", Mechanical Engineering Department, Stanford University, Apr 2008
10. "Nanomanufacturing technology for multifunctional nanodevices", 7th Korea-US Joint Symposium: MEMS and Bioengineering, Sep 2009, Daejeon, Korea
11. "Nanopatterning of functional bio and nanomaterials by nanoimprinting", 2nd Asian Symposium on Nanoimprint Lithography, ITRI, Taiwan, Oct 2009
12. "Eco-Friendly hybrid nanomanufacturing for intelligent environment sensing applications", Hewlett Packard (HP) Laboratory, Apr 2010
13. "Research activities of MINT Lab @KAIST – Nanomanufacturing and nanodevices", 5th ITB-KAIST Joint Workshop, Bandung, Indonesia, Jul 2010
14. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", University of Groningen, Oct 2010
15. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", 3rd International Symposium on Microchemistry and Microsystems (ISMM), Seoul, Korea, Jun 2011
16. "Intelligent environment sensing platform by eco-friendly nanomanufacturing process", Chulalongkorn University, Thailand, Jul 2011
17. "One dimensional nanostructures for intelligent and low-power environment", BIT Nano S&T Conference, Dalian, China, Oct 2011
18. "Hybrid Nanofabrication and Integration Methods for High-Performance 1D Nanostructure-based Sensors", 14th International Meeting on Chemical Sensors, Nuremburg, Germany, May 2012

Domestic (Korea)

1. "Multifunctional nanowire devices for bio/chemical sensing and manipulation", Mechanical Engineering Department, Korea Advanced Institute of Science and Technology, Jun 2008
2. "Nanomanufacturing technology for biotechnology, nanoelectronics, and multifunctional nanodevice applications", Yeungnam University, Daegu, South Korea, Oct 2008
3. "Nanomanufacturing technology for multifunctional nanodevices", Material Science and Engineering Department, Gwangju Institute of Science and Technology, Feb 2009
4. "Nanomanufacturing technology for biotechnology, nanoelectronics, and multifunctional nanodevice applications", LG Electronics, Feb 2009
5. "Nanomanufacturing technology for multifunctional nanodevices", Bio and Brain Engineering Department, KAIST, Apr 2009
6. "Nanomanufacturing technology for multifunctional nanodevices", Mechanical Engineering Department, KAIST, Apr 2009
7. "Nanomanufacturing technology for multifunctional nanodevices", Mechanical Engineering Department, Yonsei University, May 2009
8. "Nanomanufacturing technology for multifunctional nanodevices", Material Science and Engineering Department, KAIST, Jun 2009
9. "Nanomanufacturing technology for multifunctional nanodevices", Korea Research Institute of Standards and Science (KRISS), Jul 2009
10. "Introduction to nanodevice technology", Samsung Electronics Company, Jul 2009

11. "Nanotechnology, nanodevice industry, and nanomanufacturing technology for multifunctional nanodevices", Korea Institute of Industrial Technology (KITECH), Jul 2009
12. "Nanodevice technology overview", Pusan MEMS/NANO Center, Jul 2009
13. "Nanomanufacturing technology for the multifunctional nanodevice applications", Nano Korea Symposium 2009, Aug 2009
14. "Nanomanufacturing technology for multifunctional nanodevices", Korea Institute of Machinery and Materials (KIMM), Oct 2009
15. "Nanomanufacturing technology for multifunctional nanodevices", Department of Mechatronics, Gwangju Institute of Science and Technology, Oct 2009
16. "Multifunctional nanowire array for the biochemical sensing and manipulation", Fall Meeting 2009, Korean Society of Mechanical Engineers, Nov 2009
17. "Multifunctional nanowire devices for bio/chemical sensing & manipulation", KITECH, Ansan, Dec 2009
18. "Introduction to nanotechnology and nanomanufacturing for nanodevice applications", MEMS/NANO-Green Technology Forum, Pusan, Dec 2009
19. "Nanomanufacturing technology for multifunctional nanodevice applications", ERC of Micro-Thermal Systems, Seoul National University, Dec 2009
20. "Top-down/bottom-up hybrid nanofabrication of multifunctional nanowire devices", Korean Chemistry Society, Apr 2010
21. "Introduction to nanomaterials and their nanodevice applications", Samsung Electronics, May 2010
22. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", KNU-ETRI Center, Kyungpook National University, May 2010
23. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Kookmin University, May 2010
24. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Aju University, Jun 2010
25. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Korea Research Institute of Chemical Technology (KRICT), Aug 2010
26. "Nanomanufacturing technology for multifunctional nanodevices", Korea Electronics Technology Institute (KETI), Sep 2010
27. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Electronics and Telecommunications Research Institute (ETRI), Sep 2010
28. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Department of Biomedical Engineering, Korea University, Dec 2010
29. "Nanomanufacturing technology for biotechnology, nanoelectronics, and multifunctional nanodevice applications", Dec 2010
30. "Top-down, bottom-up, and hybrid nanofabrication for multifunctional nanowire electronics applications", Jan 2011
31. "Hybrid nanofabrication of functional nanowires for advanced sensing applications", Korea Institute of Materials Science, Feb 2011
32. "Facile fabrication of one-dimensional nanostructures for advanced sensing applications", Korea Institute of Materials Science, Mar 2011
33. "Hybrid nanofabrication technologies for nanowire-based sensing and microfluidic systems", Ulsan Institute of Science and Technology (UNIST), Mar 2011
34. "Hybrid nanofabrication of nanowire/nanotube-based high performance sensor devices", Department of Mechanical Engineering, Kookmin University, Aug 2011
35. "Intelligent environment sensing platform by eco-friendly nanomanufacturing process", KCC Workshop, KAIST Institute of NanoCentury, Jun 2011
36. "Smart environment sensing by functional nanomaterials & hybrid nanomanufacturing", Daegu Institute of Science and Technology (DGIST), Sep 2011

37. "Smart environment sensing by functional nanomaterials & hybrid nanomanufacturing", Department of Mechanical Engineering, POSTECH, Sep 2011
38. "Smart environment sensing by functional nanomaterials & hybrid nanomanufacturing", Department of Mechanical Engineering, Kyungpook National University, Sep 2011
39. "Smart environment sensing by functional nanomaterials & hybrid nanomanufacturing", Korea Institute of Machinery and Materials (KIMM), Oct 2011
40. "Intelligent technologies for environmental monitoring based on nanomaterials and nanodevices", Konkuk University, Oct 2011
41. "Nanosensing device and platform based on functional nanostructures", Department of Electronic Engineering, Gangneung-Wonju National University, Nov 2011
42. "Flexible nanoelectronics and sensing technology", Department of Mechanical Engineering, Aju University, Nov 2011
43. "Nanomaterial-based environmental monitoring device technology", Annual Meeting of Korean Sensors Society, Nov 2011
44. "Physical / Chemical Sensing by Functional / Hybrid Nanomaterials", Seoul Asan Medical Center, Jan 2012
45. "Direct micro/nano-patterning of functional nanomaterials on flexible substrates and mechanical reliability", Next Generation Lithography Workshop, Feb 2012
46. "Physical / Chemical Sensing by Functional / Hybrid Nanomaterials", Korea Research Institute of Standards and Science (KRISS), Feb 2012
47. "Micro/nano-technologies for wearable and flexible sensing platforms", Samsung Advanced Institute of Technology (SAIT), Jul 2012
48. "Physical / Chemical Sensing by Functional / Hybrid Nanomaterials", Daegu Institute of Science and Technology (DGIST), Aug 2012
49. "Functional nanomaterials for flexible sensing platform", Nano Korea Conference, Aug 2012
50. "MEMS chemical sensor technology", Samsung Electromechanics, Aug 2012
51. "Physical/chemical sensing by functional/hybrid nanomaterials", Seoul Asan Medical Center, Aug 2012
52. "Nanomaterial-based environmental monitoring device technology", Department of Materials Science and Engineering, Chonbuk National University, Oct 2012
53. "Nanomaterial-integrated microfluidic device for chemical/bio-sensing and manipulation", KAIST-Cornell Workshop, Oct 2012
54. "Introduction to MEMS/Nanotechnology", Changwon National University, Dec 2012