

TAEIL KIM, Ph.D.

Assistant Professor, Mechanical Engineering
School of Engineering and Computer Science
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EDUCATION

Ph.D. in Mechatronic Systems Engineering Sep 2016 - Sep 2019

Simon Fraser University (SFU), Burnaby, British Columbia, Canada

Advisor: Dr. Woo Soo Kim

Thesis: Three-dimensional Printing of Conductive Composite for Wireless Chemical Sensor Systems.

M.S. in Mechatronic Systems Engineering Sep 2015 - Sep 2016

Simon Fraser University, Burnaby, British Columbia, Canada

Advisor: Dr. Woo Soo Kim

Transferred to Ph.D. program after 1st year

M.S. in Management Engineering Mar 2002 - Aug 2004

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

Thesis: Job description change management triggered by entity-relationship model in enterprise data modeling.

B.S. in Materials Science & Engineering Mar 1997 - Feb 2002

Pohang University of Science and Technology (POSTECH), Pohang, South Korea

Exchange student at University of Maryland, College Park, Maryland, US (Aug 1999 - Dec 1999)

RESEARCH EXPERIENCE

Assistant Professor at Baylor University Jan 2023-present

Department of Mechanical Engineering

- Research on Integrated Sensor System for Health Monitoring

Postdoctoral Researcher at Seoul National University Aug 2022 - Dec 2022

Research Institute of Advanced Materials

Advisor: Dr. Ho Won Jang

- Research on Wearable Sensors based on Nano Technology for Health Monitoring

Postdoctoral Researcher at Simon Fraser University

Jun 2021 - Jun 2022

Department of Mechatronic Systems Engineering

Advisor: Dr. Woo Soo Kim

- Research on Structural Health Monitoring Systems with Robot Assisted Additive Manufactured Sensors and Sustainable Energy Devices for Biomedical Applications

Postdoctoral Researcher at University of California Irvine (UCI) Sep 2019 - May 2021

Department of Electrical Engineering and Computer Science

Advisor: Dr. Rahim Esfandyarpour

- Research on 3D Printed Wearable Integrated Biosensors (ions, cortisol, respiration, pulse, pH, temperature, skin hydration, and electrocardiogram sensors) for Biomedical Applications

Graduate Research Assistant, Simon Fraser University

Sep 2015 - Sep 2019

Faculty of Applied Sciences, School of Mechatronic Systems Engineering

Advisor: Dr. Woo Soo Kim

- Researched on A Humanoid Robot Hand Triggering its Motion through Chemical Sensing based on Ion Selective Membrane Electrodes.
- Researched on Wireless Ion Sensor Platforms by using Direct Ink Writing (DIW) based 3D printing technology and developing Conductive Biocompatible Cellulose Ink material in collaboration with researchers from the Swiss Federal Laboratories for Materials Science and Technology (Empa).
- Researched on Electrical Property depending on Filler Orientation in 3D Printed Composite Ink material composed of Photo-Curable Resin and AgNW by DIW based 3D printing and conducting Simulations of Fluid Flow in Extrusion Nozzles.

PUBLICATIONS

1. A. H. Kalhori, **T. Kim**, W. S. Kim, “Enhanced RF Response of 3D Printed Wireless LC Sensors using Dielectrics with High Permittivity”, *Flexible and Printed Electronics*, (2023). [DOI](#)
2. S. NajafiKhoshnoo, **T. Kim**, J. A. Tavares-Negrete, X. Pei, P. Das, S. W. Lee, J. Rajendran, and R. Esfandyarpour, “A 3D Nanomaterials-Printed Wearable, Battery-free, Biocompatible, Flexible, and Wireless pH Sensor System for Real-Time Health Monitoring”, *Advanced Materials Technologies*, 2201655 (2023). [DOI](#)
3. **T. Kim**, A. H. Kalhori, C. Bao, T. Kim, and W. S. Kim, “3D Designed Battery-free Wireless Origami Pressure Sensor”, *Microsystems & Nanoengineering*, (2022). [DOI](#)
4. Qian Yi, S. Najafikhoshnoo, P. Das, S. Noh, E. Hoang, **T. Kim**, and Rahim Esfandyarpour, “All-3D-Printed, Flexible, and Hybrid Wearable Bioelectronic Tactile Sensors Using Biocompatible Nanocomposites for Health Monitoring”, *Advanced Materials Technologies*, 2101034 (2021). [DOI](#)

5. **T. Kim**, Qian Yi, Emily Hoang, and Rahim Esfandyarpour, “A 3D Printed Wearable Bioelectronic Patch for Multi-Sensing and In Situ Sweat Electrolyte Monitoring” *Advanced Materials Technologies*, 2001021 (2021). [DOI](#) **Highlighted as the Frontispiece**
 6. **T. Kim**, M. Kaur, and W. S. Kim, “Humanoid Robot Actuation through Precise Chemical Sensing Signals” *Advanced Materials Technologies*, 1900570 (2019). [DOI](#) **Selected as a Journal Front Cover**
 7. **T. Kim**, C. Bao, M. Hausmann, G. Siqueira, T. Zimmermann, and W. S. Kim, “3D Printed Disposable Wireless Ion Sensors with Biocompatible Cellulose Composites” *Advanced Electronic Materials* **5**, pp. 1800778 (2019). [DOI](#) **Selected as a Journal Front Cover**
 8. **T. Kim**, R. Trangkanukulkij, and W. S. Kim, “Nozzle Shape Guided Filler Orientation in 3D Printed Photo-curable Nanocomposites” *Scientific Reports*, **8**, pp. 3805 (2018). [DOI](#)
 9. J. Park, **T. Kim** and W. S. Kim, “Conductive Cellulose Composites with Low Percolation Threshold for 3D Printed Electronics” *Scientific Reports*, **7**, pp. 3246 (2017). [DOI](#)
 10. L. Jian, **T. Kim**, J. Park, J. Wang, and W. S. Kim, “High Performance 3D Printed Electronics Using Electroless Plated Copper” *AIP Advances* **7**, pp. 035314 (2017). [DOI](#)
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PRESENTATIONS

1. “A Wirelessly Pressure Monitoring 3D Integrated Insole” at *2022 Materials Research Society (MRS) Spring Meeting & Exhibit - Virtual*. May 2022.
 2. **T. Kim** and W.S. Kim, “3D Printed Disposable Wireless Ion Selective Sensing Platform”, *Proceeding of IEEE IFETC*, 9073715, Aug 2019.
 3. **T. Kim**, K. Andrews, and W.S. Kim, “3D Printed Flexible Coreless Transformers”, *Proceeding of IEEE IFETC*, 8584017, Aug 2018.
 4. R. Trankanu, **T. Kim**, and W.S. Kim, “A 3D printed Flexible Passive RFID for Temperature Sensing”, *Proceeding of IEEE IFETC*, 8583913, Aug 2018.
 5. “Epitaxially Printed Stretchable Sensor with Silver Nanowire Composites” at *2016 Materials Research Society (MRS) Fall Meeting & Exhibit in Boston, MA, US*. Nov 2016.
 6. “Extrusion printing of AgNW based composites in photo-curable resin matrix” at *2017 BC Tech summit, Vancouver Convention Centre, Canada*. Mar 14-15, 2017.
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TEACHING EXPERIENCE

Baylor University

- **BME 5360 Introduction to Biomedical Engineering**

University of California, Irvine

- **Student Mentoring:** 4 Ph.D. students, 1 Master student, 2 undergraduate research assistants in the laboratory

Simon Fraser University

- **Student Mentoring:** 2 Ph.D. students, 2 Master students, 2 undergraduate research assistants in the laboratory
- **Teaching Assistant, MSE490 Integrated Additive Mechatronic Manufacturing**
Developed Lab sessions with 3 professors and instructed 21 students regarding 3D printing, Dual material printing, Optimization of printing parameters, and Testing 3D printed strain sensor. (May - Aug 2019)
- **Teaching Assistant, MSE480 Manufacturing Systems**
Instructed and supervised 80-100 students in lab sessions regarding machining and kinematics of 5 axis robotic arms. (Jan - Apr 2019, Jan - Apr 2018, May - Aug 2017)
- **Teaching Assistant, MSE425 Nano Manufacturing**
Prepared teaching materials and taught how to use Atomic Force Microscope for surface morphology analysis and Probe Station for characterization of thin-film transistors. (May - Aug 2018)
- **Teaching Assistant, MSE220 Engineering Materials**
Prepared teaching materials and conducted tutorials of CES Edu pack which is an education software for material selection and addressed students' questions. (Sep - Dec 2017, Sep - Dec 2016)
- **Supervising:** 8 undergraduate research assistants (Sep 2016 - Aug 2019)

GRANTS AND AWARDS

- **SFU Graduate Fellowship** Spring 2019, Spring 2018, Spring 2017, Fall 2016
- **SFU Faculty of Applied Sciences Graduate Fellowship** Spring 2018
- **KAIST Government Scholarship** Mar 2002
- **POSTECH Excellent Academic Performance**
Aug 2000, Aug 1999, Feb 1998, Aug 1997
- **POSTECH Exchange Student Scholarship** Jun 1999
- **POSTECH Entrance Scholarship** (Exemption from all tuition fees) Mar 1997

SERVICE TO THE PROFESSION

Review Editor on the Editorial Board of Flexible Electronics Aug 2020 - Present

PROFESSIONAL EXPERIENCE

Strategy & Planning Manager, SK Engineering & Construction Co. Ltd.,

Oct 2012 - Jul 2015

- Planned and executed preparation of launching a new power plant O&M business.
- Prepared proposals of overseas business for power plants in Myanmar and Panama.
- Developed the strategy to improve competence of Power Plant Center of Excellence.
- Evaluated as a High Potential Performer of Power Plant Center of Excellence.

Overseas Project Assistant Manager, KEPCO Plant Service & Engineering Co. Ltd.,

Dec 2008 - Oct 2012

- Supervised a water treatment team and developed standard procedures.
- Managed all aspects of overseas projects of power plants.
- Prepared an operation procedure for upgrade of Eraring power plant in *Australia*.

Senior Market Researcher, DAEWOO Electronics Corp.,

Aug 2004 - Nov 2008

- Planning, conducting, and managing product & market research projects.
 - Leading statistical analysis of survey result of customer satisfaction measurement.
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SKILLS

- Extrusion Bioprinter, Light-based Bioprinter, Direct Ink Writing Extrusion 3D printer, Fused Filament Fabrication 3D printer
 - Scanning Electron Microscopy, Atomic Force Microscope
 - Vector Network Analyzer, Potentiostat, Source meter, LCR meter
 - Tensile tester, Evaporator, Planetary mixer, Viscometer, Centrifuge
 - ANSYS Polyflow, ANSYS HFSS, ANSYS Electronics
 - Programming Languages (C, C++, JAVA, Python)
 - Statistical program (SPSS)
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ACTIVITIES

- LG Eco-friendly Appropriate Technology Research Meeting (Jun 2015 - present)
 - Inter-Varsity Christian Fellowship Leader and Representative (Jan 1998 - Dec 1999)
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REFERENCES

1. **Woo Soo Kim**, Associate Professor, Mechatronic Systems Engineering, SFU
Contacts: woosook@sfu.ca, +1-778-782-8635

2. **Rahim Esfandyarpour**, Assistant Professor, Electrical Engineering and Computer Science, Biomedical Engineering, UCI
Contacts: rahimes@uci.edu, +1-949-824-5980
3. **Kevin Oldknow**, Senior advisor to the provost, Associate Professor, School of Sustainable Energy Engineering, SFU
Contacts: koldknow@sfu.ca, +1-778-782-7017
4. **Edward Jung Wook Park**, Professor, Mechatronic Systems Engineering, SFU
Contacts: ed_park@sfu.ca, +1-778-782-8662
5. **Byron Gates**, Professor, Department of Chemistry, SFU
Contacts: bgates@sfu.ca, +1-778-782-8066