

## **Asst. Prof. DOOYOUNG HAH**

### **Personal Information**

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### **International Researcher IDs**

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Publons / Web Of Science ResearcherID: A-7587-2009

ScopusID: 6701711129

Yoksis Researcher ID: 216418

### **Education Information**

Doctorate, Korea Advanced Institute Of Science And Technology, College Of Engineering, Department Of Electrical Engineering And Computer Science, South Korea 1996 - 2000

Postgraduate, Korea Advanced Institute Of Science And Technology, College Of Engineering, Department Of Electrical Engineering, South Korea 1994 - 1996

Undergraduate, Korea Advanced Institute Of Science And Technology, College Of Engineering, Department Of Electrical Engineering, South Korea 1990 - 1994

### **Foreign Languages**

English, C1 Advanced

Korean, C1 Advanced

### **Dissertations**

Doctorate, A low voltage RF MEMS switch, Korea Advanced Institute Of Science And Technology, Engineering, Electrical Engineering, 2000

Postgraduate, Optical coupler sensor with movable waveguide, Korea Advanced Institute Of Science And Technology, Engineering, Electrical Engineering, 1995

### **Research Areas**

Electrical and Electronics Engineering, Electronic, Sensing Devices and Transducers, Electronic Circuits, Microwave Circuits, Nanotechnology, Optics and Photonics, Passive Circuit Components, Cables, Switches and Connectors, Energy, Renewable energy, MEMS, Optical Materials and Devices, Semiconducting Materials and Devices, Engineering and Technology

### **Academic Titles / Tasks**

Assistant Professor, Abdullah Gul University, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği, 2018 - Continues

Assistant Professor, Abdullah Gul University, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği, 2014 - 2018  
Assistant Professor, Louisiana State University and Agricultural and Mechanical College, College Of Engineering, Electrical And Computer Engineering, 2005 - 2012  
Research Assistant PhD, University of California, Los Angeles, School Of Engineering And Applied Science, Electrical Engineering, 2004 - 2005  
Other, Electronics And Telecommunications Research Institute, Human Information Research, Microsystems, 2002 - 2004  
Research Assistant PhD, University of California, Los Angeles, School Of Engineering And Applied Science, Electrical Engineering, 2000 - 2001  
Research Assistant PhD, Korea Advanced Institute Of Science And Technology, Engineering, Electrical Engineering, 2000 - 2000  
Research Assistant, Korea Advanced Institute Of Science And Technology, Engineering, Electrical Engineering, 1994 - 2000

## **Courses**

AGUways II, Undergraduate, 2021 - 2022  
ELECTRONICS I , Undergraduate, 2021 - 2022, 2020 - 2021, 2018 - 2019, 2017 - 2018, 2016 - 2017  
Electronics II, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2016 - 2017  
NANO-AND MICRO-SCALE SYSTEM DESIGN CAPSULE , Undergraduate, 2022 - 2023  
Life at AGU, Undergraduate, 2022 - 2023  
Sensor System Design Capsule, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021  
ELECTRONICS I LAB. , Undergraduate, 2021 - 2022, 2020 - 2021, 2018 - 2019, 2017 - 2018, 2016 - 2017  
ELECTRIC CIRCUITS I , Undergraduate, 2021 - 2022, 2020 - 2021  
Electronics II Laboratory, Undergraduate, 2021 - 2022, 2020 - 2021, 2016 - 2017  
ELECTRIC CIRCUITS I LABORATORY , Undergraduate, 2021 - 2022, 2020 - 2021  
Digital Design Laboratory, Undergraduate, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018, 2016 - 2017, 2015 - 2016  
Digital Design, Undergraduate, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018, 2016 - 2017, 2015 - 2016  
Semiconductor Process and Device Fabrication, Undergraduate, 2020 - 2021, 2018 - 2019, 2017 - 2018  
AGUways, Undergraduate, 2019 - 2020, 2018 - 2019, 2017 - 2018

## **Advising Theses**

İçöz K., Hah D., Respiration monitoring using a flexible paper-based capacitive sensor, Postgraduate, İ.SOLAK(Student), 2022  
HAH D., Foldable substrates for micro-ultrasonic transducers, Postgraduate, K.Balasubramanian(Student), 2011  
HAH D., Surface-enhanced Raman spectroscopy substrates based on nanoporous silicon and pattern transfer, Postgraduate, P.Rao(Student), 2011  
HAH D., Back-end processing of scanning mirrors with scratch drive actuators, Postgraduate, P.Pai(Student), 2011  
HAH D., Two-dimensional microscanners with T-shaped hinges and piezoelectric actuators, Postgraduate, W.Song(Student), 2009  
HAH D., A study on buckled-beam actuators for RF MEMS applications, Postgraduate, S.Park(Student), 2007

## **Published journal articles indexed by SCI, SSCI, and AHCI**

- I. Electret vibration energy harvesters with symmetrically configured curved-beam hinges  
HAH D.

Microsystem Technologies, vol.30, no.3, pp.331-341, 2024 (SCI-Expanded)

- II. **Hemispherical-shell-shaped organic photovoltaic cells for absorption enhancement and improved angular coverage**  
HAH D.  
Journal of Photonics for Energy, vol.14, no.1, 2024 (SCI-Expanded)
- III. **Analysis of electret-based vibration energy harvesting devices with curved-beam hinges**  
HAH D.  
Journal of Intelligent Material Systems and Structures, vol.34, no.14, pp.1702-1712, 2023 (SCI-Expanded)
- IV. **Respiration monitoring using a paper-based wearable humidity sensor, a step forward to clinical tests**  
Solak İ., Gençer S., Yıldırım B., Öznur E., HAH D., İÇÖZ K.  
Sensors and Actuators A: Physical, vol.355, 2023 (SCI-Expanded)
- V. **RF MEMS variable attenuators with improved dB-linearity**  
HAH D.  
Microsystem Technologies, vol.29, no.3, pp.311-320, 2023 (SCI-Expanded)
- VI. **Shell-shaped active layers for omnidirectional organic photovoltaic cells**  
HAH D.  
Journal of Photonics for Energy, vol.12, no.4, 2022 (SCI-Expanded)
- VII. **AIN Piezoelectric Quad-Actuators for 2D Optical Micro Scanning**  
HAH D.  
INTEGRATED FERROELECTRICS, vol.225, no.1, pp.376-383, 2022 (SCI-Expanded)
- VIII. **Analysis of optical gyroscopes with vertically stacked ring resonators**  
HAH D.  
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, vol.29, no.3, pp.1554-1564, 2021 (SCI-Expanded)
- IX. **Absorption enhancement by semi-cylindrical-shell-shaped structures for an organic solar cell application**  
HAH D.  
APPLIED OPTICS, vol.59, no.28, pp.8645-8652, 2020 (SCI-Expanded)
- X. **Linear variable optical attenuators with shaped-finger comb-drive actuators**  
HAH D.  
APPLIED OPTICS, vol.59, no.2, pp.277-284, 2020 (SCI-Expanded)
- XI. **Analytical design of MEMS variable capacitors based on shaped-finger comb-drives**  
Hah D.  
Microsystem Technologies, 2019 (SCI-Expanded)
- XII. **All-polymer ultrasonic transducer design for an intravascular ultrasonography application**  
HAH D.  
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, vol.27, no.4, pp.2444-2455, 2019 (SCI-Expanded)
- XIII. **C-band optical filters with micromechanical tuning**  
Hah D.  
MICROSYSTEM TECHNOLOGIES-MICRO-AND NANOSYSTEMS-INFORMATION STORAGE AND PROCESSING SYSTEMS, vol.24, pp.551-560, 2018 (SCI-Expanded)
- XIV. **A design method of comb-drive actuators for linear tuning characteristics in mechanically tunable optical filters**  
Hah D.  
Microsystem Technologies, vol.23, pp.3835-3842, 2017 (SCI-Expanded)
- XV. **Clinical probe utilizing surface enhanced Raman scattering**  
Kim J., HAH D., Daniels-Race T., Feldman M.  
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B, vol.32, no.6, 2014 (SCI-Expanded)
- XVI. **Note: Folded optical system for narrow forward looking probe**

- Hou H., Hah D., Kim J., Feldman M.  
REVIEW OF SCIENTIFIC INSTRUMENTS, vol.85, no.2, 2014 (SCI-Expanded)
- XVII. **Nanorough gold for enhanced Raman scattering**  
Kim J., Kang K., Sarkar A., Malempati P., Hah D., Daniels-Race T., Feldman M.  
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B, vol.31, no.6, 2013 (SCI-Expanded)
- XVIII. **Electrophoretic Deposition of Carbon Nanotubes on Silicon Substrates**  
Sarkar A., Hah D.  
JOURNAL OF ELECTRONIC MATERIALS, vol.41, no.11, pp.3130-3138, 2012 (SCI-Expanded)
- XIX. **Combined soil moisture meter and penetrometer**  
Feldman M., Hah D., Hanifa K., Zhang Z.  
Geotechnical Testing Journal, vol.35, no.3, pp.437-440, 2012 (SCI-Expanded)
- XX. **Mechanically tunable optical filters with a microring resonator**  
Hah D., Bordelon J., Zhang D.  
APPLIED OPTICS, vol.50, no.22, pp.4320-4327, 2011 (SCI-Expanded)
- XXI. **Analysis of resonant optical gyroscopes with two input/output waveguides**  
Hah D., Zhang D.  
OPTICS EXPRESS, vol.18, no.17, pp.18200-18205, 2010 (SCI-Expanded)
- XXII. **Experimental characterization of two-axis MEMS scanners with hidden radial vertical combdrive actuators and cross-bar spring structures**  
Tsai J., Hsieh T., Liao C., Chiou S., Hah D., Wu M. C.  
JOURNAL OF MICROMECHANICS AND MICROENGINEERING, vol.19, no.4, 2009 (SCI-Expanded)
- XXIII. **Pre-shaped buckled-beam actuators: Theory and experiments**  
Park S., Hah D.  
SENSORS AND ACTUATORS A-PHYSICAL, vol.148, no.1, pp.186-192, 2008 (SCI-Expanded)
- XXIV. **Two-axis MEMS scanners with radial vertical combdrive actuators - design, theoretical analysis, and fabrication**  
Tsai J., Chiou S., Hsieh T., Sun C., Hah D., Wu M. C.  
JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS, vol.10, no.4, 2008 (SCI-Expanded)
- XXV. **1 x N-2 wavelength-selective switch with two cross-scanning one-axis analog micromirror arrays in a 4-f optical system**  
Tsai J., Huang S., Hah D., Wu M.  
JOURNAL OF LIGHTWAVE TECHNOLOGY, vol.24, no.2, pp.897-903, 2006 (SCI-Expanded)
- XXVI. **MEMS-actuated photonic crystal switches**  
Lee M., Hah D., Lau E., Toshiyoshi H., Wu M.  
IEEE PHOTONICS TECHNOLOGY LETTERS, vol.18, pp.358-360, 2006 (SCI-Expanded)
- XXVII. **Surface- and bulk-micromachined two-dimensional scanner driven by angular vertical comb actuators**  
Piyawattanametha W., Patterson P., Hah D., Toshiyoshi H., Wu M.  
JOURNAL OF MICROELECTROMECHANICAL SYSTEMS, vol.14, no.6, pp.1329-1338, 2005 (SCI-Expanded)
- XXVIII. **A self-aligned vertical comb-drive actuator on an SOI wafer for a 2D scanning micromirror**  
Hah D., Choi C., Kim C., Jun C.  
JOURNAL OF MICROMECHANICS AND MICROENGINEERING, vol.14, no.8, pp.1148-1156, 2004 (SCI-Expanded)
- XXIX. **Angular vertical comb-driven tunable capacitor with high-tuning capabilities**  
Nguyen H., Hah D., Patterson P., Chao R., Piyawattanametha W., Lau E., Wu M.  
JOURNAL OF MICROELECTROMECHANICAL SYSTEMS, vol.13, no.3, pp.406-413, 2004 (SCI-Expanded)
- XXX. **Theory and experiments of angular vertical comb-drive actuators for scanning micromirrors**  
Hah D., Patterson P., Nguyen H., Toshiyoshi H., Wu M.  
IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS, vol.10, no.3, pp.505-513, 2004 (SCI-Expanded)
- XXXI. **Open-loop operation of MEMS-based 1 X N wavelength-selective switch with long-term stability and repeatability**  
Tsai J., Huang S., Hah D., Toshiyoshi H., Wu M.

- IEEE PHOTONICS TECHNOLOGY LETTERS, vol.16, no.4, pp.1041-1043, 2004 (SCI-Expanded)
- XXXII. **Low-voltage, large-scan angle MEMS analog micromirror arrays with hidden vertical comb-drive actuators**  
Hah D., Huang S., Tsai J., Toshiyoshi H., Wu M.  
JOURNAL OF MICROELECTROMECHANICAL SYSTEMS, vol.13, no.2, pp.279-289, 2004 (SCI-Expanded)
- XXXIII. **A low voltage actuated microelectromechanical switch for RF application**  
Hah D., Yoon E., Hong S.  
JAPANESE JOURNAL OF APPLIED PHYSICS PART 1-REGULAR PAPERS SHORT NOTES & REVIEW PAPERS, vol.40, pp.2721-2724, 2001 (SCI-Expanded)
- XXXIV. **A low-voltage actuated micromachined microwave switch using torsion springs and leverage**  
Hah D., Yoon E., Hong S.  
IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol.48, no.12, pp.2540-2545, 2000 (SCI-Expanded)
- XXXV. **An optomechanical pressure sensor using multimode interference couplers with polymer waveguides on a thin p(+)-Si membrane**  
Hah D., Yoon E., Hong S.  
SENSORS AND ACTUATORS A-PHYSICAL, vol.79, no.3, pp.204-210, 2000 (SCI-Expanded)
- XXXVI. **An optomechanical pressure sensor using multimode interference couplers**  
Hah D., Yoon E., Hong S.  
JAPANESE JOURNAL OF APPLIED PHYSICS PART 1-REGULAR PAPERS SHORT NOTES & REVIEW PAPERS, vol.38, pp.2664-2668, 1999 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Flexible and Ecofriendly Keypad Based on Paper and Pencil**  
Er S. F., Kalabey N., HAH D.  
IEEE Sensors Letters, vol.7, no.11, 2023 (ESCI)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Effects of Curved-Beam Heights to Harvested Energy in a Balanced Comb-Drive Configuration**  
HAH D.  
Symposium on Design, Test, Integration and Packaging of MEMS and MOEMS, Paris, France, 25 - 27 August 2021
- II. **Quasi-Static Operation of 2-Axis-Tilt Microscanners with AlN Piezoelectric Quad-Actuators**  
HAH D.  
Symposium on Design, Test, Integration and Packaging of MEMS and MOEMS, Paris, France, 25 - 27 August 2021
- III. **Planar MEMS Variable Optical Attenuators (VOAs) with Linear Attenuation-Voltage Characteristics**  
HAH D.  
2019 Symposium on Design, Test, Integration and Packaging of MEMS and MOEMS, DTIP 2019, Paris, France, 12 - 15 May 2019
- IV. **Analytical design of linear variable capacitors with shaped-finger comb-drive actuators**  
HAH D.  
20th Symposium on Design, Test, Integration and Packaging of MEMS and MOEMS, DTIP 2018, Roma, Italy, 22 - 25 May 2018, pp.1-5
- V. **Design of capacitive micromachined ultrasonic transducers (CMUTs) on a flexible substrate for intravascular ultrasonography (IVUS) applications**  
HAH D., Je C. H., Lee S.  
19th Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS, DTIP 2017, Bordeaux, France, 29 May - 01 June 2017

- VI. **An FEM study of die attach packaging effect on nanomechanical Si optical filters**  
Seok S., HAH D.  
19th Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS, DTIP 2017, Bordeaux, France, 29 May - 01 June 2017
- VII. **Design of wide-band tunable optical filters with cascaded microring resonators and shaped-finger comb-drive actuators**  
HAH D.  
18th Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS, DTIP 2016, Budapest, Hungary, 30 May - 02 June 2016
- VIII. **Design of mechanically tunable optical filters with microring resonators**  
HAH D., Bordelon J.  
17th Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS, DTIP 2015, Montpellier, France, 27 - 30 April 2015
- IX. **Performance Improvement of a Two-Axis Radial-Vertical-Combdrive Scanner by Using a Symmetric Spring Design**  
Hsieh T., Chang Y., Chiou S., Tsai J., Hah D., Wu M. C.  
IEEE/LEOS International Conference on Optical MEMS and Nanophotonics, Freiburg, Germany, 11 - 14 August 2008, pp.108-109
- X. **A two-axis MEMS scanner driven by radial vertical combdrive actuators**  
Chiou S., Hsieh T., Tsai J., Sun C., Hah D., Wu M. C.  
IEEE/LEOS International Conference on Optical MEMS and Nanophotonics, Hualian, Taiwan, 12 - 16 August 2007, pp.83-84
- XI. **Silicon-based on-chip micromirrors for DWDM wavelength-selective crossconnects**  
Chi C., Hou C., Lee C., HAH D., Wu M. C.  
IEEE/LEOS International Conference on Optical MEMS and Their Applications Conference, 2006, Big Sky, MT, United States Of America, 21 - 24 August 2006, pp.130-131
- XII. **Integrated 1x4 wavelength-selective switch with on-chip MEMS micromirrors**  
Chi C., Tsai J., Lee M. M., HAH D., Wu M. C.  
Conference on Lasers and Electro-Optics, CLEO 2006, Long Beach, CA, United States Of America, 21 May 2006
- XIII. **Silicon-based monolithic 4x4 wavelength-selective cross connect with on-chip micromirrors**  
Chi C., Tsai J., Hah D., Mathai S., Lee M. M., Wu M. C.  
Conference on Optical Fiber Communications/National Fiber Optic Engineers Conference, California, United States Of America, 5 - 10 March 2006, pp.91-92
- XIV. **Solid-immersion micromirror with enhanced angular deflection for silicon-based planar lightwave circuits**  
Chi C., Tsai J., Hah D., Jeong K., Wu M.  
10th IEEE/LEOS International Conference on Optical MEMs and Their Applications, Oulu, Finland, 1 - 04 August 2005, pp.131-132
- XV. **A large port-count 1x32 wavelength-selective switch using a large scan-angle, high fill-factor, two-axis analog micromirror array**  
Tsai J., Fan L., Chi C., HAH D., Wu M. C.  
30th European Conference on Optical Communication, Stockholm, Sweden, 5 - 09 September 2004, pp.1-2
- XVI. **A high fill-factor, large scan-angle, two-axis analog micromirror array driven by leverage mechanism**  
Tsai J., Fan L., HAH D., Wu M. C.  
International Conference on Optical MEMS and Their Applications, Takamatsu, Japan, 22 - 26 August 2004, pp.30-31
- XVII. **Scanning micromirrors: An overview**  
Patterson P., Hah D., Fujino M., Piyawattanametha W., Wu M.  
Conference on Optomechatronic Micro/Nano Components, Devices and Systems, Pennsylvania, United States Of America, 27 - 28 October 2004, vol.5604, pp.195-207
- XVIII. **A Surface and Bulk Micromachined Angular Vertical Combdrive for Scanning Micromirrors**

- Piyawattanametha W., Patterson P., Wu M., HAH D., Toshiyoshi H.  
Optical Fiber Communication Conference (OFC), Atlanta, United States Of America, vol.86, pp.251-252
- XIX. **Wavelength-selective 1xN2 switches with two-dimensional input/output fiber arrays**  
Tsai J., Huang S., HAH D., Wu M. C.  
CLEO 2003, Baltimore, United States Of America, 1 - 06 June 2003, pp.772-774
- XX. **MOEM scanners for optical networks**  
HAH D., Choi C., Jun C., Kim Y., Patterson P., Toshiyoshi H., Wu M. C.  
The 9th KIEE MEMS symposium, Seoul, South Korea, 06 February 2003, pp.13-19
- XXI. **Nano-electro-mechanical photonic crystal switches**  
Lee M., HAH D., Lau E., Toshiyoshi H., Wu M. C.  
6th International Symposium on Contemporary Photonics Technology (CPT 2003), Tokyo, Japan, 15 - 17 January 2003, pp.135-138
- XXII. **1xN(2) wavelength-selective switch with telescope-magnified 2D input/output fiber collimator array**  
Tsai J., Huang S., Hah D., Wu M.  
IEEE/LEOS International Conference on Optical MEMS, Hawaii, United States Of America, 18 - 21 August 2003, pp.45-46
- XXIII. **A self-aligned vertical comb-drive actuator using surface micromachining for scanning micromirrors**  
Hah D., Choi C., Jun C., Kim Y.  
IEEE/LEOS International Conference on Optical MEMS, Hawaii, United States Of America, 18 - 21 August 2003, pp.151-152
- XXIV. **A 2D scanner by surface and bulk micromachined angular vertical comb actuators**  
Piyawattanametha W., Patterson P., Hah D., Toshiyoshi H., Wu M.  
IEEE/LEOS International Conference on Optical MEMS, Hawaii, United States Of America, 18 - 21 August 2003, pp.93-94
- XXV. **Wavelength-selective 1xN2 switches with two-dimensional input/output fiber arrays**  
Tsai J., Huang S., HAH D., Wu M. C.  
Conference on Lasers and Electro-Optics (CLEO); Postconference Digest, Baltimore, MD, United States Of America, 1 - 06 June 2003, vol.88, pp.775-777
- XXVI. **Analog micromirror arrays with orthogonal scanning directions for wavelength-selective 1XN(2) switches**  
Tsai J., Huang S., Hah D., Wu M.  
12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03), Massachusetts, United States Of America, 8 - 12 June 2003, pp.1776-1779
- XXVII. **MEMS photonic devices and their applications**  
Wu M., HAH D., Huang S., Tsai J.  
7th Optoelectronics and communications conference (OECC 2002), Yokohama, Japan, 8 - 12 July 2002, pp.38-39
- XXVIII. **A novel tunable MEMS capacitor based on angled vertical comb drive actuators**  
Nguyen H., HAH D., Patterson P., Chao R., Piyawattanametha W., Wu M. C.  
Hilton Head 2002 Solid-State Sensor & Actuator Workshop, Hilton Head Island, United States Of America, 3 - 06 June 2002, pp.277-280
- XXIX. **Low voltage MEMS micromirror arrays with hidden vertical comb-drive actuators**  
HAH D., Huang S., Nguyen H., Chang H., Tsai J., Toshiyoshi H., Wu M. C.  
Hilton Head 2002 Solid-State Sensor & Actuator Workshop, Hilton Head Island, United States Of America, 3 - 06 June 2002, pp.11-14
- XXX. **Design of electrostatic actuators for MOEMS applications**  
Hah D., Toshiyoshi H., Wu M.  
Conference on Design, Test, Integration, and Packaging of MEMS/MOEMS 2002, Cannes, France, 6 - 08 May 2002, vol.4755, pp.200-207
- XXXI. **Open-loop operation of MEMS WDM routers with analog micromirror array**  
Huang S., Tsai J., Hah D., Toshiyoshi H., Wu M.  
IEEE/LEOS International Conference on Optical MEMS, LUGANO, Switzerland, 20 - 23 August 2002, pp.179-180

- XXXII. **Microelectromechanical scanning devices for optical networking applications**  
Wu M. C., HAH D., Patterson P. R., Toshiyoshi H.  
2002 IEEE International Solid-State Circuits Conference, San Francisco, CA, United States Of America, 3 - 07 February 2002, pp.288
- XXXIII. **Advanced MEMS for photonics**  
Wu M., Patterson P., HAH D., Lee M., Huang S., Tsai J.  
60th Device Research Conference, DRC 2002, California, United States Of America, 24 - 26 June 2002, vol.2002-January, pp.13-16
- XXXIV. **Recent advances in optical MEMS devices and systems**  
Patterson P., Hah D., Lee M., Tsai J., Wu M.  
Conference on Photonic Devices and Algorithms for Computing IV, Washington, United States Of America, 8 - 09 July 2002, vol.4788, pp.1-8
- XXXV. **MOEMS electrostatic scanning micromirrors design and fabrication**  
Patterson P., Hah D., Su G., Toshiyoshi H., Wu M.  
1st International Symposium on Integrated Electronics, Pennsylvania, United States Of America, 12 - 17 May 2002, vol.2002, pp.369-380
- XXXVI. **A Low Voltage, Large Scan Angle MEMS Micromirror Array with Hidden Vertical Comb-Drive Actuators for WDM Routers**  
HAH D., Huang S., Nguyen H., Chang H., Wu M. C., Toshiyoshi H.  
Optical Fiber Communication Conference, OFC 2002, California, United States Of America, 17 March 2002, pp.92-93
- XXXVII. **MEMS WDM routers using analog micromirror arrays**  
Wu M., Tsai J., Huang S., Hah D.  
15th Annual Meeting of the IEEE-Lasers-and-Electro-Optics-Society, Glasgow, England, 10 - 14 November 2002, pp.582-583
- XXXVIII. **A scanning micromirror with angular comb drive actuation**  
Patterson P., Hah D., Nguyen H., Toshiyoshi H., Chao R., Wu M.  
15th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2002), Nevada, United States Of America, 20 - 24 January 2002, pp.544-547
- XXXIX. **Integration of a honeycomb micromirror with a surface micromachined 2D scanner for improved performance**  
Patterson P., Su G., HAH D., Wu M. C.  
AVS 48th International Symposium, San Francisco, United States Of America, 29 October - 02 November 2001, pp.1
- XL. **An angular vertical comb drive actuator for scanning micromirrors**  
Patterson P., HAH D., Chang H., Toshiyoshi H., Wu M. C.  
International Conference on Optical MEMS and Their Applications, Okinawa, Japan, 25 - 28 September 2001, pp.25-26
- XLI. **Low voltage actuated RF MEMS switches using push-pull operation**  
HAH D., Yoon E., Hong S.  
International Conference on Solid State Devices and Materials, Sendai, Japan, 28 - 31 August 2000, pp.392-393
- XLII. **Surface micromachined microwave switch with push-pull configuration**  
HAH D., Yoon E., Hong S.  
The 2nd Korean MEMS Conference, Daejeon, South Korea, 07 April 2000, pp.263-268
- XLIII. **A low voltage actuated micromachined microwave switch using torsion springs and leverage**  
Hah D., Yoon E., Hong S.  
IEEE MTT-S International Microwave Symposium (IMS2000), Massachusetts, United States Of America, 11 - 16 June 2000, pp.157-160
- XLIV. **Optomechanical pressure sensors using multi-mode interference couplers on thin p+-Si membranes**  
HAH D., Yoon E., Hong S.  
The 6th Korean Conference on Semiconductor, Seoul, South Korea, 01 February 1999, pp.175-176
- XLV. **Optical coupler sensor with movable waveguide**  
HAH D., Hong S., Kwon Y.



## Supported Projects

HAH D., Project Supported by Higher Education Institutions, Theoretical study on optical filters with nanoelectromechanical tuning, 2016 - 2018

HAH D., Other International Funding Programs, Optical probe for microscopic cancer identification in minute structures, 2009 - 2013

HAH D., Other International Funding Programs, Carbon nanotube reinforced metal matrix composites for microelectromechanical systems (MEMS) applications, 2011 - 2012

HAH D., Other International Funding Programs, Compact MEMS-based optical probe modules for optical coherence tomography (OCT) application, 2006 - 2011

HAH D., Other International Funding Programs, Room temperature deposition of carbon nanotube film, 2010 - 2010

HAH D., Other International Funding Programs, Micro glow discharge devices, 2009 - 2010

HAH D., Other International Funding Programs, Enhancement of nanoscale surface characterization capabilities for multi-disciplinary researches, 2007 - 2010

HAH D., Other International Funding Programs, Combined soil moisture meter and dynamic cone penetrometer (DCP), 2007 - 2008

HAH D., Other International Funding Programs, Low-voltage, laterally-driven RF microelectromechanical (MEM) switches fabricated by single-mask process, 2006 - 2007

## Metrics

Publication: 83

Citation (WoS): 945

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H-Index (Scopus): 17