

Asst. Prof. DOOYOUNG HAH

Personal Information

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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, Nanotechnology, Optics and Photonics, Passive Circuit Components, Cables, Switches and Connectors, MEMS, Optical Materials and Devices, Engineering and Technology

Academic Titles / Tasks

Assistant Professor, Abdullah Gül Üniversitesi, Mühendislik Ve Doğa Bilimleri Fakültesi, Elektrik-Elektronik Mühendisliği, 2018 - Continues

Assistant Professor, Abdullah Gül Üniversitesi, Mühendislik Ve Doğa Bilimleri 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

Advising Theses

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

Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- I. **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
(Journal Indexed in SCI)
- II. **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 (Journal Indexed in SCI)
- III. **Linear variable optical attenuators with shaped-finger comb-drive actuators**
HAH D.
APPLIED OPTICS, vol.59, no.2, pp.277-284, 2020 (Journal Indexed in SCI)
- IV. **Analytical design of MEMS variable capacitors based on shaped-finger comb-drives**
Hah D.
Microsystem Technologies, 2019 (Journal Indexed in SCI Expanded)
- V. **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 (Journal Indexed in SCI)
- VI. **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 (Journal Indexed in SCI)
- VII. **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 (Journal Indexed in SCI)
- VIII. **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 (Journal Indexed in SCI)
- IX. **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 (Journal Indexed in SCI)

- X. **Electrophoretic Deposition of Carbon Nanotubes on Silicon Substrates**
Sarkar A., Hah D.
JOURNAL OF ELECTRONIC MATERIALS, vol.41, no.11, pp.3130-3138, 2012 (Journal Indexed in SCI)
- XI. **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 (Journal Indexed in SCI)
- XII. **Mechanically tunable optical filters with a microring resonator**
Hah D., Bordelon J., Zhang D.
APPLIED OPTICS, vol.50, no.22, pp.4320-4327, 2011 (Journal Indexed in SCI)
- XIII. **Analysis of resonant optical gyroscopes with two input/output waveguides**
Hah D., Zhang D.
OPTICS EXPRESS, vol.18, no.17, pp.18200-18205, 2010 (Journal Indexed in SCI)
- XIV. **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 (Journal Indexed in SCI)
- XV. **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 (Journal Indexed in SCI)
- XVI. **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 (Journal Indexed in SCI)
- XVII. **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 (Journal Indexed in SCI)
- XVIII. **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 (Journal Indexed in SCI)
- XIX. **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 (Journal Indexed in SCI)
- XX. **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 (Journal Indexed in SCI)
- XXI. **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 (Journal Indexed in SCI)
- XXII. **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 (Journal Indexed in SCI)
- XXIII. **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 (Journal Indexed in SCI)

- XXIV. **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 (Journal Indexed in SCI)
- XXV. **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 (Journal Indexed in SCI)
- XXVI. **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 (Journal Indexed in SCI)
- XXVII. **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 (Journal Indexed in SCI)
- XXVIII. **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 (Journal Indexed in SCI)

Refereed Congress / Symposium Publications in Proceedings

- I. **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
- II. **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
- III. **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
- IV. **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
- V. **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
- VI. **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
- VII. **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.

International Conference on Optical MEMS and Nanophotonics, Freiburg, Germany, 11 - 14 August 2008, pp.108-109

- VIII. **two-axis MEMS scanner driven by radial vertical combdrive actuators**
Chiou S., Hsieh T., Tsai J., Sun C., HAH D., Wu M. C.
International Conference on Optical MEMS and Nanophotonics, Hualien, Taiwan, 12 - 16 August 2007, pp.83-84
- IX. **Silicon-based on-chip micromirrors for DWDM wavelength-selective crossconnects**
Chi C., Hou C., Lee C., HAH D., Wu M. C.
International Conference on Optical MEMS and Their Applications, Big Sky, United States Of America, 21 - 24 August 2006, pp.130-131
- X. **Silicon-based monolithic 4×4 wavelength-selective cross connect with on-chip micromirrors**
Chi C., Tsai J., HAH D., Mathai S., Lee M., Wu M. C.
OFC/NFOEC 2006, Anaheim, United States Of America, 5 - 10 March 2006, pp.1-3
- XI. **Solid-immersion micromirror with enhanced angular deflection for silicon based planar lightwave circuits**
Chi C., Tsai J., HAH D., Jeong K., Wu M. C.
International Conference on Optical MEMS and Their Applications, Oulu, Finland, 1 - 04 August 2005, pp.131-132
- XII. **Integrated 1x4 wavelength-selective switch with on-chip MEMS micromirrors**
Chi C., Tsai J., Lee M., HAH D., Wu M. C.
CLEO/QELS 2005, Baltimore, United States Of America, 22 - 27 May 2005, pp.1732-1734
- XIII. **Scanning micromirrors: an overview**
Patterson P., HAH D., Fujino M., Piyawattanametha W., Wu M. C.
SPIE, Optomechatronic Micro/Nano Components, Devices, and Systems, Philadelphia, United States Of America, 25 October 2004, vol.5604, pp.196-207
- XIV. **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
- XV. **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
- XVI. **A self-aligned vertical comb-drive actuator using surface micromachining for scanning micromirrors**
HAH D., Choi C., Jun C., Kim Y.
International Conference on Optical MEMS and Their Applications, 18 - 21 August 2003, pp.151-152
- XVII. **A 2D scanner by surface and bulk micromachined angular vertical comb actuators**
Piyawattanametha W., Patterson P., HAH D., Toshiyoshi H., Wu M. C.
International Conference on Optical MEMS and Their Applications, 18 - 21 August 2003, pp.93-94
- XVIII. **1xN2 wavelength-selective switch with telescope-magnified 2D input/output fiber collimator array**
Tsai J., Huang S., HAH D., Wu M. C.
International Conference on Optical MEMS and Their Applications, 18 - 21 August 2003, pp.45-46
- XIX. **Analog micromirror arrays with orthogonal scanning directions for wavelength selective 1xN2 switches**
Tsai J., Huang S., HAH D., Wu M. C.
Transducers '03, Boston, United States Of America, 8 - 12 June 2003, pp.1776-1779
- XX. **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
- XXI. **A surface and bulk micromachined angular vertical combdrive for scanning micromirrors**
Piyawattanametha W., Patterson P., HAH D., Toshiyoshi H., Wu M. C.

OFC 2003, Atlanta, United States Of America, 23 - 28 March 2003, pp.251-252

- XXII. **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
- XXIII. **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
- XXIV. **MEMS WDM routers using analog micromirror arrays**
Wu M. C. , Tsai J., Huang S., HAH D.
IEEE LEOS Annual Meeting (LEOS 2002), Glasgow, United Kingdom, 11 - 14 November 2002, pp.582-583
- XXV. **Open-loop operation of MEMS WDM routers with analog micromirror array**
Huang S., Tsai J., HAH D., Toshiyoshi H., Wu M. C.
International Conference on Optical MEMS and Their Applications, Lugano, Switzerland, 23 - 26 August 2002, pp.179-180
- XXVI. **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
- XXVII. **Recent advances in optical MEMS devices and systems**
Patterson P., HAH D., Lee M., Tsai J., Wu M. C.
International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, United States Of America, 7 - 11 July 2002, pp.1-8
- XXVIII. **Advanced MEMS for photonics**
Wu M. C. , Patterson P., HAH D., Lee M., Huang S., Tsai J.
60th Annual Device Research Conference, Santa Barbara, United States Of America, 24 - 26 June 2002, pp.13-16
- XXIX. **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
- XXX. **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
- XXXI. **MOEMS electrostatic scanning micromirrors design and fabrication**
Patterson P., HAH D., Toshiyoshi H., Wu M. C.
201st Meeting of the Electrochemical Society – 1st International Symposium on Integrated Optoelectronics, Philadelphia, United States Of America, 12 - 17 May 2002, pp.369-380
- XXXII. **Design of electrostatic actuators for MOEMS applications**
HAH D., Toshiyoshi H., Wu M. C.
Symposium on Design, Test, Integration and Packaging for MEMS/MOEMS, Cannes, France, 6 - 08 May 2002, pp.200-207
- XXXIII. **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., Toshiyoshi H., Wu M. C.
OFC 2002, Anaheim, United States Of America, 17 - 22 March 2002, pp.92-93
- XXXIV. **Microelectromechanical scanning devices for optical networking applications**
Wu M. C. , HAH D., Patterson P., Toshiyoshi H.
ISSCC 2002, San Francisco, United States Of America, 4 - 06 February 2002, pp.358-359
- XXXV. **A scanning micromirror with angular comb drive actuation**
Patterson P., HAH D., Nguyen H., Toshiyoshi H., Chao R., Wu M. C.
15th IEEE Micro Electro Mechanical Systems Conference, Las Vegas, United States Of America, 20 - 24 January

2002, pp.544-547

- XXXVI. **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
- XXXVII. **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
- XXXVIII. **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
- XXXIX. **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
- XL. **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
- XLI. **Optical coupler sensor with movable waveguide**
HAH D., Hong S., Kwon Y.
The 3rd Korean Conference on Semiconductor, Jeongju, South Korea, 5 - 06 February 1996, pp.457-458

Supported Projects

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

HAH D., Other Supported Projects, Optical probe for microscopic cancer identification in minute structures, 2009 - 2013

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

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

HAH D., Other Supported Projects, Room temperature deposition of carbon nanotube film, 2010 - 2010

HAH D., Other Supported Projects, Micro glow discharge devices, 2009 - 2010

HAH D., Other Supported Projects, Enhancement of nanoscale surface characterization capabilities for multi-disciplinary researches, 2007 - 2010

HAH D., Other Supported Projects, Combined soil moisture meter and dynamic cone penetrometer (DCP), 2007 - 2008

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

Citations

Total Citations (WOS):645

h-index (WOS):12