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Dr. Byoungyoul Park

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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Primary Affiliation

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Dr. Byoungyoul Park

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Korean	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/9 (2018/11) Post-doctorate, Electrical and Computer Engineering, The University of Manitoba
  Supervisors: Cyrus Shafai, 2018/9 - 2018/11
- 2018/5 Doctorate, Electrical and Computer Engineering, The University of Manitoba
  Supervisors: Cyrus Shafai, 2012/9 - 2018/5
- 2007/2 Master's Thesis, Nano Science and Technology, Seoul City University
  Supervisors: Park Kyoungwan, 2005/3 - 2007/2
- 2002/2 Bachelor's, Chemical Engineering, Korea University

Recognitions

2022/6 Nominated Outstanding Achievement Awards 2022
National Research Council Canada
Honor
Nominated NRC Rising Star Award which recognizes an individual who, during their formative years with the NRC, has contributed far beyond expectations and who exemplifies the organization's values. This award is intended to recognize excellence in research.

2021/6 Nominated Outstanding Achievement Awards 2021
National Research Council Canada
Honor
Nominated NRC Rising Star Award which recognizes an individual who, during their formative years with the NRC, has contributed far beyond expectations and who exemplifies the organization's values. This award is intended to recognize excellence in research.

2021/4
NANO Ambassador Award
National Research Council Canada
Prize / Award
This is an annual internal award given by the Nanotechnology Research Centre. Researchers are nominated for awards by their peers. To be eligible for this award, researchers must achieve outstanding results in a variety of internal/external research, technology exchange, and mutual collaboration activities.

2019/3
NANO Project Leadership Award
National Research Council Canada
Prize / Award
The Nanotechnology Research Centre bestows this award on an annual basis. Award nominations are made by their peers. To be eligible for this award, researchers must have demonstrated exceptional project management and leadership in a variety of collaborative and solo projects.

2017/10
Koch Fertilizer Canada, Ltd. Bursary - Canadian Scholarships - 1,950
The University of Manitoba
Prize / Award
Min GPA 3.5 with excellent research and school activities presented in the reference letter.

2017/8
Technical Presentation Award
The Association of Korean-Canadian Scientists and Engineers
Prize / Award
It is Issued by Canada-Korea Conference (CKC). The Association of Korean-Canadian Scientists and Engineers (AKCSE) and the Korean Federation of Science and Technology Societies are organising the Canada-Korea Conference on Science and Technology. The CKC is an annual multidisciplinary conference that aims to bring experts and leaders from research institutes, industry, academia, and the governments of Canada and Korea together to discuss emerging and future challenges in science, technology, and innovation (ST&I).

2017/8
Journal paper research work selected on the cover page of Journal of Micromechanics and Microengineering
IOP Publishing
Honor
B. Park, E. Afsharipour, D. Chrusch, C. Shafai, D. Andersen, and G. Burley, “Large displacement bi-directional out-of-plane Lorentz actuator array for surface manipulation,” Journal of Micromechanics and Microengineering, vol. 27, no. 8, p. 085005, Aug. 2017, doi: 10.1088/1361-6439/aa7970.

2017/2 - 2017/9
NSERC Fellowship - 14,000
The University of Manitoba
Prize / Award
Excellent research and development.

2016/1 - 2016/12 UMGF (University of Manitoba Graduate Fellowship) - 18,000
The University of Manitoba
Prize / Award
The value of these fellowships is $16,000 (Ph.D.) and is $12,000 (Master's). Application forms for this competition become available at the end of November, and completed applications with official transcripts attached must normally be received by the Department you are applying to by January 15 of the following year. Students are notified of the outcome of this competition in the last two weeks of March and funding begins in September of that year. If you wish to apply for this fellowships, please write the department you are applying to and request that they forward an application form to you when it becomes available for the next competition.

User Profile

Research Specialization Keywords: Nano/Micro Electro Mechanical System (N/MEMS), Deformable Mirror, Polymer nano-composite, flexible electronics

Employment

2021/4 Research Council Officer
National Research Council Canada
- Research and Development of MEMS Lorentz deformable mirror - Ideation and writing research proposal - Supervision of co-op, masters and PhD students - Setup of an electronic/optical measurement for AO and electromagnetic MEMS DM - Design and microfabrication of Lorentz MEMS actuator array and MEMS mirror.

2022/9 - 2027/8 Adjunct Professor
Chemical and Material Engineering, University of Alberta
Full-time, Adjunct
Tenure Status: Non Tenure Track
- Lead research collaboration with department partners - Funding ideation and proposal - Co-supervision of Master's and PhD students

2018/12 - 2021/4 Associate Research Officer
National Research Council Canada
- Research and Development of MEMS Lorentz deformable mirror - Supervision of co-op students - Setup of an electronic/optical measurement for AO and electromagnetic MEMS DM - Design and microfabrication of Lorentz MEMS actuator array and MEMS mirror.

2018/9 - 2018/11 Postdoctoral Fellowship
Electrical and Computer Engineering, Faculty of Engineering, The University of Manitoba
Full-time, Term
Tenure Status: Non Tenure Track
Continued research on the development low voltage MEMS deformable mirror.

2012/9 - 2018/8 Research Assistant
Electrical and Computer Engineering, Faculty of Engineering, The University of Manitoba
Full-time, Term
Tenure Status: Non Tenure Track
- Research and development of MEMS Low voltage deformable mirror - Cleanroom training

2016/1 - 2018/5
Teaching Assistant
Electrical and Computer Engineering, Faculty of Engineering, The University of Manitoba
Part-time, Term
Tenure Status: Non Tenure Track
Assist in the instruction of the Introduction to Microelectronic Fabrication course.

2010/3 - 2011/3
Director of the Catalyst Development 1 Team
E&D Solution
• Managed and supervised four team members. • Conducted research on improving the conversion efficiency of the noble metal vehicle catalytic converter (e.g. DOC - Diesel Oxidation Catalysts, DPF – Diesel Particulate Filter). • Conducted research on optimizing sintering temperature for DOC production process. • Supervised and inspected the installation, modification, and testing of the catalytic converter, D.I water system and laboratory equipment. • Training and teaching team member through lecture series such as Sol-gel chemistry, FT-IR, etc.

2008/4 - 2009/5
Manager
LG Innotek
• Analyzed, documented, and established technology development strategy for the light emitting diode (LED). • Reported to company executives about technology and the patent issue of world-leading companies. • Being trained in Six Sigma.

2007/1 - 2008/4
Research Engineer
Seoul Semiconductor
• Conducted research on transparent epoxy packaging with various nanoparticles. • Designed new LED packages design and developed fabrication process. • Supervised and inspected the installation, modification, testing and operation of LED fabrication equipment. • Analyzed (mainly with Six-sigma), documented and developed LED fabrication process to enhance the yield. • Training quality control and production technician.

2005/3 - 2007/3
Research Assistant
Nano Science and Technology, Seoul City University
Full-time, Term
Tenure Status: Non Tenure Track
• Designed, fabricated, and tested a new silicon-based light emitting diode.• Managed and operated Lab. equipment such as PECVD, PLD, LPCVD, evaporator, dehydrator, etc.

2003/9 - 2006/10
Research Assistant
KISTI (Korea Institute of Science and Technology Information)
• Analyzed and documented nanotechnology trends with journal papers and patents. • Reported to Korea Government.

2002/9 - 2003/9
Research Assistant
KATECH (Korea Automotive Technology Institute)
• Developed non-flammable polymer/clay nanocomposites for automobile windshield applications. • Managed and operated the lab. equipment such as an extruder, injection mold, UTM, TGA, DSC, FT-IR, etc…

1995/9 - 1997/11
Sergent
Republic of Korean Army

Research Funding History

Awarded [n=4]

2021/1 - 2024/3
Principal Investigator
Development of Low Power Deformable Mirror Adaptive Optics Driven by MEMS-Based Lorentz Force Actuators, Grant

Funding Sources:
National Research Council Canada (NRC) (Ottawa, ON)
High-throughput and Secure Networks Challenge program
Total Funding - 49,260
Portion of Funding Received - 34,000
Funding Competitive?: Yes

2021/7 - 2023/7
Co-investigator

Printed sensors and actuators for developing smart skin, Contract

Funding Sources:
National Research Council Canada (NRC) (Ottawa, ON)
Nanotechnology Research Centre Team Capability Program
Total Funding - 87,671
Portion of Funding Received - 87,671
Funding Competitive?: Yes

2021/6 - 2023/5
Principal Investigator

Accelerated MEMS Design Optimization Enabled by AI with Application to Optical Networks, Grant

Funding Sources:
National Research Council Canada (NRC) (Ottawa, ON)
Artificial Intelligence for Design Challenge Program
Total Funding - 10,000
Portion of Funding Received - 10,000
Funding Competitive?: Yes

2018/12 - 2022/12
Principal Knowledge User

Advanced Integrated Adaptive Optics for Improved Ground-Based Telescope Capabilities, Grant

Funding Sources:
National Research Council Canada (NRC) (Ottawa, ON)
Internal Capability Development
Total Funding - 373,993
Portion of Funding Received - 373,993
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=7]

2022/5 - 2022/8
Principal Supervisor

Taebin Kim, University of Alberta
Thesis/Project Title: Development of MEMS bonding and flip-chip bonding process for MEMS Lorentz deformable mirror
Present Position: Undergraduate student, University of Alberta

2021/5 - 2021/12
Principal Supervisor

Taebin Kim (In Progress) , University of Alberta
Thesis/Project Title: Microfabrication of Low voltage MEMS deformable mirror.
Present Position: Undergraduate student, University of Alberta

2021/1 - 2021/4
Co-Supervisor

Catlin Letendre, University of Alberta
Thesis/Project Title: Development of standard operation procedure of electronics lab including reflow oven, pick and place, Stencil printer, and PCB printer.
Present Position: Undergraduate student, University of Alberta

2020/5 - 2020/12
Principal Supervisor

Rayan Basodan, The University of British Columbia
Thesis/Project Title: Develop AO test bench and material printer set up.
Present Position: Master Student, University of Alberta

2019/7 - 2022/7 Co-Supervisor	Carissa Ouellette (Completed) , National Research Council Canada Thesis/Project Title: Circuit board design and electrical prototyping lab management. Present Position: Left
2019/5 - 2019/12 Principal Supervisor	Kevin Huang (Completed) , The University of British Columbia Thesis/Project Title: Develop micro-dispensing technology for Micro-Electro-Mechanical System (MEMS) conductive Through Silicon Via (TSV) filling. Present Position: Master Student, The University of British Columbia
2019/5 - 2019/8 Principal Supervisor	Dhrish Amin (Completed) , University of Alberta Thesis/Project Title: Set up Laser positioning system for DM deflection and RF measurement Present Position: Electrical Engineer, Kleinfelder.com

Master's Thesis [n=1]

2021/7 - 2022/9 Co-Supervisor	Rayan Basodan (In Progress) , University of Alberta Thesis/Project Title: Development of 3D-printed hydrogel sensor platform Present Position: Master Student

Technician [n=1]

2021/10 - 2022/6 Principal Supervisor	Wazedur Md Rahman, National Research Council Canada Thesis/Project Title: Improving the microfabrication process of MEMS Lorentz deformable mirror Present Position: Technical Officer, National Research Council Canada

Committee Memberships

2019/12 - 2021/4	Group Chair, Nanotechnology Research Centre Research Associate Committee, National Research Council Canada - Organize NRC wide international/domestic science and technology seminar - Participation and supply opinion on improving research environment in NRC represent Nanotechnology Research Center. - Support for new RA members onboarding.

Other Memberships

2015/9	General Member, Institute of Electrical and Electronics Engineers
2015/5	Member, Canadian Astronomical Society

Presentations

1. (2022). One-step laser engraved FPCB MEMS Lorentz force actuator for large aperture deformable mirror application. CSME 2022, Edmonton, Canada
   Main Audience: Researcher
   Invited?: No, Keynote?: No
2. (2022). Enhanced travel range bipolar tri-electrode electrostatic actuator using extended background electrode. SPIE Photonics West 2022, San Francisco, United States
   Main Audience: Researcher
   Invited?: No, Keynote?: No

3. (2022). Investigation of methods of through silicon via filling using conductive paste and silver nanowires. NanoCanada 2022, Edmonton, Canada
   Main Audience: Researcher
   Invited?: No, Keynote?: No
4. (2021). Low Voltage Deformable Mirror System Driven by MEMS-Based Lorentz Actuator Arrays. COMSOL Day, United States
   Main Audience: Researcher
   Invited?: Yes, Keynote?: No
5. (2021). Development of MEMS low voltage deformable mirror (LVDM) for Adaptive Optics. NRC TechX 2021, Edmonton, Canada
   Main Audience: Researcher
   Invited?: No, Keynote?: No
6. (2021). Thermal Stress Analysis and Stabilization of Metal and SU-8 Coatings for Tri-Layer Mirror. CCECE 2021, Edmonton, Canada
   Main Audience: Researcher
   Invited?: No, Keynote?: No
7. (2020). Simulation Of A Scaled-up Deformable Mirror System Driven By MEMS-Based Lorentz Actuator Arrays. COMSOL 2020 conference, United States
   Main Audience: Researcher
   Invited?: No, Keynote?: No
8. (2018). An electromagnetically actuated 3-axis gimbal-less micro-mirror for beam steering. IEEE 2018 International Conference on Optical MEMS and Nanophotonics (OMN), Lausanne, Switzerland
   Main Audience: Researcher
   Invited?: No, Keynote?: No
9. (2018). Aluminum-Polymer Deformable Mirror using Electromagnetic Actuators for Spatial Light Modulation. IEEE 2018 International Conference on Optical MEMS and Nanophotonics (OMN), Lausanne, Switzerland
   Main Audience: Researcher
   Invited?: No, Keynote?: No
10. (2018). Next-generation adaptive optics: a low-voltage ASIC driver for MEMS deformable mirrors. Adaptive Optics Systems VI, Austin, United States
    Main Audience: Researcher
    Invited?: No, Keynote?: No
11. (2017). Study MEMS in the Heart of North America. Canada-Korea Conference 2017, Montreal, Canada
    Main Audience: Researcher
    Invited?: No, Keynote?: No
12. (2017). A Lorentz Force Actuated Continuous Deformable Polymer Mirror for Wavefront Control. 31st Eurosensors, Paris, France
    Main Audience: Researcher
    Invited?: No, Keynote?: No
13. (2017). Next-Generation Adaptive Optics on the TMT: An ASIC Driver for Low-Voltage MEMS Deformable Mirrors. Adaptive Optics for Extremely Large Telescopes (AO4ELT5) conference, Tenerfe, Spain
    Main Audience: Researcher
    Invited?: No, Keynote?: No
14. (2017). Large Tilt Angle Lorentz Force Actuated Micro-Mirror with 3 DOF for Optical Applications. 31st Eurosensors, Paris, France
    Main Audience: Researcher
    Invited?: No, Keynote?: No

15. (2017). A Low Voltage Lorentz Actuator Enabled Deformable Polymer Mirror (DPM) System for Smart MEMS Sheet. Canada-Korea Conference 2017, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No

16. (2016). Development of a Novel MEMS-Based Horseshoe Shape Lorentz Actuator Array for Adaptive Optics. Manitoba Material Conference 2016, Winnipeg, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No

17. (2016). Development of a Novel MEMS-Based Low Current Lorentz Actuator Array for Adaptive Optics. CASCA Annual Conference, Winnipeg, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No

Publications

Journal Articles

1. Mehdi Allameh, Byoungyoul Park, Cyrus Shafai. (2022). Enhancedtravel range bipolar tri-electrode electrostatic actuator using extendedbackground electrode. Proceedings of SPIE MOEMS and Miniaturized Systems XXI. 12013
Published
Refereed?: Yes

2. R. A.M. Basodan, H.-J Chung, B. Park. (2021). Smartpersonal protective equipment (PPE): current PPE needs, opportunities fornanotechnology and e-textiles. Nano Research,IOP Science Flexible and Printed Electronics. 6: 043004.
Published
Refereed?: Yes

3. E. Afsharipour, R. Soltanzadeh, B. Park, D. Chrusch, and C. Shafai. (2019). Low-powerthree-degree-of-freedom Lorentz force microelectromechanical system mirror foroptical applications. Journal of Micro/Nanopatterning, Materials, and Metrology. 18(1): 015001.
Published
Refereed?: Yes

4. Byoungyoul Park, Elnaz Afsharipour, Dwayne Chrusch, Cyrus Shafai, David Andersen and Greg Burley. (2018). A Low Voltage and Large Stroke Lorentz Force Continuous Deformable Polymer Mirror for Wavefront Control.Sensors and Actuators A. 280: 197-204.
Published
Refereed?: Yes

5. Byoungyoul Park, Elnaz Afsharipour, Dwayne Chrusch, Cyrus Shafai, David Andersen and Greg Burley. (2017). Large DisplacementBi-Directional Out-Of-Plane Lorentz Actuator Array for Surface Manipulation.Journal of Micromechanics and Microengineering. 27: 085005.
Published
Refereed?: Yes

6. Elnaz Afsharipour, Byoungyoul Park, and Cyrus Shafai. (2017). Determination ofReactive RF-Sputtering Parameters for Fabrication of SiOx Films SpecifiedRefractive Index, for Highly Reflective SiOx Distributed Bragg Reflector.IEEE Photonics Journal. 9: 1-16.
Published
Refereed?: Yes

7. Byoungyoul Park, Meiting Le, Sampath Liyanage and Cyrus Shafai. (2016). Lorentz force basedresonant MEMS magnetic field sensor with optical readout.Sensors and Actuators A. 241: 12-18.
Published
Refereed?: Yes

Intellectual Property

Patents

1. LED Package and Method for Fabrication the Same. Korea, Republic of. 1015493830000.
Patent Status: Granted/Issued
Year Issued: 2015
Inventors: Banghyun Kim, Hukwon Kwon, Yunhee Kim, Junghoon Kim, Eunjung Sea and Byoungyoul Park
2. Light-Emitting Device. Korea, Republic of. 1015092300000.
Patent Status: Granted/Issued
Year Issued: 2015
Inventors: Jeahoo Jo, Byoungyoul Park, Banghyun Kim and Sangchul Lee
3. LED PACKAGE AND METHOD FOR FABRICATING THE SAME. United States. 1014884480000.
Patent Status: Granted/Issued
Year Issued: 2015
Inventors: Chung Hoon Lee, Yoon Hee Kim, Byung Yeol Park, Bang Hyung Kim, Eun Jung Seo, Hyouk Won Kwon
4. LED Package and Method for Fabrication the Same. Korea, Republic of. 1014234550000.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Banghyun Kim, Hukwon Kwon, Yunhee Kim, Junghoon Kim, Eunjung Sea and Byoungyoul Park
5. Light Emitting Diode Having Metal Pattern and Method for Manufacturing the Same. Korea, Republic of. 1013748960000.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Byoungyoul Park and Wonil Kim
6. Light Emitting Diode Having Phosphor Thin Film and Method for Manufacturing the Same. Korea, Republic of. 1013656240000.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Byoungyoul Park and Eunjung Sea
7. Light Emitting Device. Korea, Republic of. 1015377970000.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Byoungyoul Park, Banghyun Kim, Sangchul Lee and Jeahoo Jo
8. LED Package with its Interfacial Delamination Reduced. Korea, Republic of. 1013748980000.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Yunhee Kim and Byoungyoul Park
9. Light Emitting Diode and Method of Manufacturing the same. Korea, Republic of. 1013189720000.
Patent Status: Granted/Issued
Year Issued: 2013
Inventors: Byoungyoul Park and Banghyun Kim