Dr. Bharathkumar Mareddi

Mobile: (+91) 9993233393 E-mail: 1992mbkr@gmail.com Current Address: Bengaluru, India.

EXPERIENCE

Assistant Professor

- *Christ University, Bangalore, India.*
 - Opto-Electronic Devices
 - Basic Electronics & Digital Electronics

Post-Doctoral Researcher

- **4** IMEC & KU Leuven, Leuven, Belgium.
 - Design and Imprinting of Nanostructured lines and pillars for Color filters (Multispectral and Hyperspectral), Meta lens for AR/VR.
 - Simulations using FDTD, for measuring the optical transmission at certain wavelengths.

Visiting Research Scholar

4 Hong Kong University of Science and Technology, Hong Kong.

Department of Electronic & Computer Engineering.

Research Assistant

4 Kyungpook National University, South korea.

Department of Electronic & Computer Engineering.

• Polarization-Independent Structured tri layer birefringent materials.

EDUCATION

Ph.D. in Electrical Engineering – 95%

Kyungpook National University, South Korea

Dissertation title: Ultrathin, Polarization-Insensitive, and Focus-Tunable Liquid Crystal Diffractive Fresnel Flat Lens for Augmented Reality and Vision Corrections.

Project advantages:

- Lens (266 µm thick) using ultrathin flexible and bendable substrate.
- Lens (245 µm thick) using ultrathin willow glass substrate.
- Lightweight & conformable (1.5 gram).
- Tunable optical power range: $-3D \sim +3D$ wide optical tunability.
- Polarization independent.
- User friendly installation to AR/VR Systems.
- Tried anti-reflective coating on the lens.
- Working with equipment such as Lithography, Thermal evaporator, AFM, XRD, SEM, deposition & etching techniques. *Thesis Supervisor*: Prof. Jonghoo Park.

M.Tech in Electronics and Communications Engineering – 87.3%

- **4** Sree Vidyanikethan Engineering College. (1 year)
- **Indian Institute of Technology (IIT Bombay). (1 year)- Internship**

Dec 2021 – June 2023

Aug 2023 – Present

<u>Aug 2020 – Jan 2021</u>

Mar 2016 – Aug 2020

Aug 2013 – May 2015

ultispectral and

Feb 2021 – May 2021

Dissertation title: Low-Cost Fabrication of Piezoelectric Devices using flexible materials.

Supervisors: Prof. V. Ramgopal Rao (Director of IIT Delhi), Prof. Ramamurthy Dwivedula (Director of GIET).

B.Tech in Electronics and Communications Engineering – 70% Aug 2009 – June 2013

Jawaharlal Nehru Technological University, Anantapur, India. **.**

11th & 12th in Narayana College, MPC – **88.4**%

10th in SSCE High School, Andhra Pradesh – 85.2%

TEACHING INTREST

- **Optical Fiber Communications**
- Fundamentals of Electronic Device Fabrication
- Very Large-Scale Integration (VLSI)
- Electromagnetic Theory and Transmission Lines (EMTL) .
- **Optics and Photonics**

RESEARCH EXPERTISE

- Optics: Design and Fabrication of Focus Tunable (Refractive and Diffractive), and Multifocal Thin Flat Lens (Bi-Focal, Tri-Focal Lens).
- Polarization-Independent Structured Optical Devices.
- LCOS Phase Modulators (Fast Response, High Phase Shift).
- Liquid Crystals.
- Optics for AR/VR System.
- Nano Imprint Lithography, Colour Filters, Retroreflectors, Electro polarizers, Expenders

CLEAN ROOM & HANDS-ON EXPERIENCE

- UV Lithography (Karl Suss MJB4, MA6, MA8 Gen 4 PRO, Midas System MDA 8000B),
- Thermal Evaporator, Wet Etching, Lift off,
- O2 Plasma (Stripper), Nano imprinting,
- SEM (Scanning Electron Microscope) & Optical Microscope,
- AFM, Profilometer, & LDV,
- Thin Film Deposition Techniques Spin Coating. Etc.

SKILLS

- Imprinting of nano structures using Lithography.
- Optical Alignment and Measurement Methods: Imaging/Non-Imaging Optical Measurements, Voltage Transmission Characterization, Response Time, Tilt Angle of Liquid Crystals, Polarization and Polarization-Independent Measurements, Mach-Zehnder and Michelson Interferometer. Etc.
- Software: Image J, Origin, Clewin, CST, Matlab, FDTD Microsoft Office, Inkscape and Solid Works. Etc.

SOFTWARE

FDTD, Image J, Origin, Clewin, CST (Basic), MATLAB (Basic), Microsoft Office, Inkscape and Solid Works.

Aug 2007 – June 2009

Aug 2004 – June 2007

AWARDS

- Best Researcher & Young Scientist Award for Innovative Research, NESIN 2020 International Research Awards.
- Awarded KNU Honors Scholarship for Ph.D. Studies. (2016 2020).
- Awarded Awarded <u>GATE-AICTE</u> Fellowship for Masters (Graduate Aptitude Test in Engineering- Indian Prestigious Competitive Exam) Ranked in Top 5% - 2013 ECE Department.
- Received Award for Educational Excellence in Bachelor of Technology (2013).
- Merit-Cum-Means (MCM) Scholarship for Undergraduate. (2009 2013).

JOURNAL PUBLICATIONS

2023

 Adesina, Mareddi Bharath Kumar, et al. and, Jonghoo Park. Liquid Infrared photodetector. Liquid phase IR detector based on of reduced graphene oxide doped liquid crystal. <u>Nanoscale – ROYAL SOC CHEMISTRY.</u> [SCI Q1 - Impact Factor: 8.3]

2022

2. Mareddi Bharath Kumar, et al. and, Jonghoo Park. *A polarization-independent phase modulation based* on trilayer of birefringent material. <u>Taylors and Francis – Liquid Crystals</u>. [SCI Q2 - Impact Factor: 2.7]

2021

3. Mareddi Bharath Kumar, et al. and, Jonghoo Park. *Electro-optic diffractive multifocal lens with electrically reconfigurable multifocal planes*. *Optics and Lasers in Engineering, Elsevier*. [SCI Q1 - Impact Factor: 5.7]

2020

- Mareddi Bharath Kumar, et al. and, Jonghoo Park. Compact vari-focal augmented reality display based on ultrathin, polarization-insensitive, and adaptive liquid crystal lens. <u>Optics and Lasers in Engineering, Elsevier</u>. [SCI Q1 - Impact Factor: 5.7]
- 5. **Mareddi Bharath Kumar**, et al. and, Jonghoo Park. *Enhancement of Birefringence in Reduced Graphene Oxide Doped Liquid Crystal.* <u>Nanomaterials, MDPI.</u> [SCI Q1 Impact Factor: 5.8]

2019

- 6. D Kang et al. and Mareddi Bharath Kumar. Simple Synthesis Method and Characterizations of Aggregation-Free Cysteamine Capped PbS Quantum Dot. <u>Applied Sciences</u>, <u>MDPI</u>. [SCI Q2 - Impact Factor: 2.9]
- 7. Mohammad Awwal Adeshina et al. and **Mareddi Bharath Kumar.** Impact of Electric Field on Propagation Velocity of Phase Boundary Between Nematic and Isotropic Phases of 5CB LC. Journal of Sensor Science and <u>Technology, The Korean Sensors Society.</u>

2016

8. A Singh et al. and Mareddi Bharath Kumar, V Ramgopal Rao. Low-cost fabrication of polymer composite (h-ZnO+ PDMS) material for piezoelectric device. <u>Materials Research Express, IOP science</u>. [SCI - Impact Factor: 2.025]

2015

9. Mareddi Bharath Kumar. et al. and D Revanth. A Novel Pliant Nanogenerator Made Of PDMS and ZnO Nanoparticles. <u>i-Manager's Journal on Electronics Engineering, iManager Publications</u>.

2014

10. Palagani Yellappa, Mareddi Bharath Kumar. et al. Memory implementation using multibit flipflop. <u>i-</u> <u>Manager's Journal on Electronics Engineering, iManager Publications</u>.

Conference:

2024

1. Mareddi Bharath Kumar, Invited talk: Presentation on Flat Optical Devices, at <u>Raman Research Institute</u>, <u>Bangalore</u>.

2022

- 2. **Mareddi Bharath Kumar.** et al. Highly Transmissive Nanostructured Multispectral Color Filters Fabricated by Nano-Imprint Lithography, <u>MNE-ES conference Leuven, Belgium. (Elsevier)</u>
- 3. K. Lodewijks, Mareddi Bharath Kumar, et al. B. Kutrzeba-Kotowska, "Multispectral Color filters based on self-aligned dual plasmonic gratings fabricated by nano-imprint lithography," in <u>Optica Advanced Photonics</u> <u>Congress 2022 (Optica Publishing Group)</u>
- 4. Mareddi Bharath Kumar, Invited talk on Flat electronics, at Symbiosis International University, Pune.
- 2020
 - 5. **Mareddi Bharath Kumar.** et al. and, Jonghoo Park. *Adaptive focus tunable liquid crystal diffractive lens for AR display. Korea Institute of Materials Organization, Winter Conference.*

Workshops:

2024

1. Mareddi Bharath Kumar. Familiarisation Workshop on - Nano sensor and Optoelectronic Devices, IIT Guwahati.

PERSONAL INFORMATION

DOB: 03-Mar-1992

Sex: Male

Languages Known: English (Fluent), Telugu (Fluent), Hindi (Communicative), Korean (Basic).

Marital Status: Married

Permanent Address: 292 FM currippa road, BHEL layout, RR Nagar, Bangalore. 560098.