Earu Banoth

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Main Research Interests

In *Vivo/Vitro* Blood Cell's rheology, Absorption Flow-Cytometry for Point-of-care diagnostic, Flow-Cytometry Particle Analysis, Design and developing of handheld diagnostic tool for Biomedical application. Microfluidics microscopy, Microfabrication which include Photolithography, Softlithography techniques, Quantitative diagnosis.

Other Research Interest

Optical Metrology for Material sense, Digital holography, Digital holographic microscopy, Image analysis, Non-destructive testing.

Education

Doctor of Philosophy (Ph.D.), Instrumentation and Applied Physics (IAP)
Indian Institute of Science, Aug 2012 – Nov 2017.
"Absorption Flow-Cytometry for Point-of-Care Diagnostics "
Advisor: Prof. Sai Siva Gorthi
Indian Institute of Science, Bangalore - 560 012 KA, India.

Master of Engineering (M.E), Electrical Engineering (EE)
Osmania University College of Engineering (OUCE), September 2009 – Nov 2011.

Bachelor of Technology (B.Tech), Electrical and Electronics Engineering
Jawaharlal Nehru Technological University Hyderabad (JNTUH), September 2004 – May 2008.

Positions

Assistant Professor — **National Institute of Technology**
In the Dept. of Biotechnology and Medical Engineering — **Rourkela, Odisha, India**
NIT Rourkela. July 2020 – Present
Working as an Assistant Professor with research interest In *Vivo/ Vitro* Blood Cell's rheology, Absorption Flow-Cytometry and Microscopy for Point-of-care diagnostic, Flow-Cytometry Particle Analysis, Design and developing of handheld diagnostic tool for Biomedical application. Microfluidics microscopy, Microfabrication which include Photolithography, Softlithography techniques, Quantitative diagnosis

Postdoctoral Fellow — **Flaum Eye Institute UofR**
In the Center for Visual Science — **Rochester, New York, USA**
University of Rochester, 601 Elmwood Ave, Nov 2019 – May 2020
Box 319, Rochester, NY 14620.
Fulbright-Nehru Postdoctoral Fellow: I Would be working on In *Vivo/Vitro* Blood Cell's rheology using Adaptive Optics Scanning Light Ophthalmoscope called as an AOSLO.

Scientist (Scientist in Physical Sciences Group) — **Tata Consultancy Services**
TCS Research and Innovation — **Bangalore, India**

Global Axis H Block, EPIP, Whitefield Road Oct 2018 – Oct 2019
Material Sense: using Digital holographic, Identification of faults and bending on surface of metal, Fringe Projection technique for faults detection, Testing and Implementation at field level for material sensing etc.

Retainer (Research Associate in ESD team) **Tata Consultancy Services**
TCS Research and Innovation **Bangalore, India**
Global Axis H Block, EPIP, Whitefield Road Dec 2017 – Oct 2018
Material Sense: using Digital holographic, Identification of faults and bending on surface of metal, Fringe Projection technique for faults detection, Testing and Implementation at field level for material sensing etc.

Research Associate **Indian Institute of Science**
Instrumentation and Applied Physics (IAP) **Bangalore, India**
Bengaluru Jan 2017 – Nov 2017
Fabrication of Optical grating for wave propagation, Developing hand held diagnostic tool for Biomedical application. Bright field microfluidics microscopy, Micro-fabrication design and developing.

Honors/Awards

- Recipient of Fulbright Nehru-Postdoctoral Fellowship from UNITED STATES-INDIA EDUCATIONAL FOUNDATION (USIEF), for the Year 2019-2021.
- Recipient of fellowship from the Ministry of Human Resources and Development (MHRD), Government of India, for my PhD program at Indian Institute of Science, Bangalore, India (August 2012 - Present).
- Recipient of fellowship from the Ministry of Human Resources and Development (MHRD), Government of India, throughout M.E (Engineering) program at Osmania University College of Engineering,Osmania University, Hyderabad - 500 007 AP, India (September 2009 - November 2011).
- Appreciation for Representing IISc-OSA Student chapter at Leadership program, in 2014.
- IEEE Bangalore Section recognizes and appreciates members who publish papers and Contribute to technical progress. (a) IEEE Journal Papers and (b) IEEE conference papers in 2015.

Patents Publications

1. *Parama Pal,* ***Earu Banoth***, "Method for automating the detection of the contours of features on any arbitrary surface using structured illumination ", *CTO1-Parent, IDF-1391083-004, (2019).*

Journal Publications

6. *Rishikesh Kulkarni,* ***Earu Banoth*** *& Parama Pal*, "Automated Surface Feature Detection using Fringe Projection: an Autoregressive Modeling-based approach ", *Optics and Lasers in Engineering, 121, pp. 506-511, 2019.*

5. ***E. Banoth****, V.K. Kasula & S. S. Gorthi*, "Portable optofluidic absorption flow analyzer for quantitative malaria diagnosis from whole blood", *Applied Optics, 55 (30), pp. 8637-8643 (2016).*

4. ***E. Banoth****, V.K. Kasula, V.K. Jagannadh & S.S. Gorthi*, "Optofluidic single-cell absorption flow analyzer for point-of-care diagnosis of malaria", *J Biophotonics, 9 (6), pp. 610-618 (2016).*

3. ***E. Banoth***, *V.K. Jagannadh & S.S. Gorthi*, "Single-cell optical absorbance characterization with high-throughput microfluidic microscopy", *IEEE Journal of Selected Topics in Quantum Electronics, 22 (3), pp. 6800106 (2016).*

2. ***E. Banoth***, *V. K. Jagannadh, R. Srinivasan & S.S. Gorthi*, "Single-cell transmittance measurements on blood-smear for the detection of malaria", *Technology Letters, 1 (9), pp. 29-33 (2014).*

1. *R. Waghmare, D. Mishra, G.R.K.S. Subrahmanyam,* ***E. Banoth*** *and S.S. Gorthi*, "Signal Tracking Approach for Phase Estimation in Digital Holographic Interferometry " *Applied Optics; 53 (19), 4150-4157,(2014).*

Refereed Conference Proceedings

5. *Rishikesh Kulkarni* ***E. Banoth*** *& Parama Pal.* "Automatic Surface Defect Detection Using Autoregressive Modeling-based Fringe Analysis"(Frontiers in Optics: the 102nd OSA Annual Meeting and Exhibit/Laser Science Conference, Sep 2018, USA) paper accepted for poster presentation.

4. ***E. Banoth*** *& S.S. Gorthi.* "Absorption Flow-Cytometer for Point-of-Care Malaria Diagnosis "(Indo-US FCM-2016 Workshop)

3. ***E. Banoth***, *V. Jagannadh & S.S. Gorthi.* "Single Cell Optical Transmittance Based Label-free Malaria Detection at the Point-of-care "12th International Conference on Fiber Optics and Photonics, OSA Technical Digest (online) (Optical Society of America, 2014), paper T3A.5

2. ***E. Banoth***, *V. K. Jagannadh, R. Srinivasan & S.S. Gorthi.* "Single-cell Transmittance Measurements on Blood-Smear for the Detection of Malaria "Optics'14 International Conference on Light, Calicut, India, 2014.

1. ***E. Banoth***, *Shiva Krishina B., Prasinjith C.* "Priority based Load Management System "National Conference at Guru Nanak Engg College, 2008.

Professional Activities

- Presented my work "Absorption Flow-Cytometer for Point-of-Care Diagnosis of Malaria "in Indo-US Workshop At IISc, India. In March 2016
- Demonstrated "Absorption Flow-Cytometer for Point-of-Care Diagnosis of Malaria "From My Research Work, at IISc Open Day program in March 2016
- Student Member: SPIE 2015 – Present
- Student Member: IEEE Photonics 2015 – 2017
- Actively Participating in Student Out-reach programs from 2014–
- Student Member: SPIE 2013-2014, OSA 2013 – Present
- Student representative in IAP Department Committee (DCC) for Open Day 2014.
- Participated FIO-OSA Student leadership Conference at USA, in October 2014.
- President of Applied Photonics Initiative (API) Student Group, IISc, 2014–
- Secretary of Optical Society of America (OSA) Student Chapter IISc, 2014–
- Active Student member of OSA and taken commendable interest in activities and program
- Active Volunteer for National Power System Conference (NPSC) during my M.E Osmania University, Hyderabad, 2011.

SKILLS

- Digital holographic techniques.
- Recording and reconstruction of Digital Hologram.
- Quantitative phase imaging, Image analysis, 3D Phase information extraction.
- Digital Holographic Microscopy in Bio-medical Applications.
- Fringe projection technique.
- Developing hand-held diagnostic tool for Bio-medical Application.
- Hands on experiences in Bright-field Microfluidics Microscopy.
- Hands on experiences in Micro-fabrication (like Photolithography and Softlithography).
- Hands on experience of building table-top optical microscope.
  - *Languages*: C
  - *Technical Software*: AutoCAD, MATLAB, LabVIEW, Microsoft Office, Latex.
  - *Platforms*: MS-Windows and Linux.

DISSERTATIONS

3. **Earu Banoth**: **Absorption Flow-Cytometry for Point-of-Care Diagnostics**, **Doctor of Philosophy (PhD)** From Indian Institute of Science, Bengaluru-560012, India. Nov-2017.

About Thesis: In my doctoral project, I have developed new diagnostic instrument which can be use in different endemic contexts for malaria detection. The approach explored is completely novel technique in the field of biomedical application. The central theme of the developed system is to bring a simple, holistic and fully automated Point-of-care diagnostic solution, which would substantially augment India and world health care system. This instrument would work efficiently in resource limited places where clinical microscopy and other laboratory diagnostic approaches are not accessible. The research work aim was to develop an instrument which can be used for the malaria detection against clinical microscopy.

2. **Earu Banoth**, *High Efficiency Voltage-Clamped DC-DC Converter With Reduced Reverse-Recovery current and Switch-Voltage Stress*, M.E from Electrical Engineering
Osmania University College of Engineering,Osmania University, Hyderabad - 500 007 Telangana, India. Nov 2011

1. **Earu Banoth**, *Priority based Load Management System*, Undergraduate Dissertation, JNTU, May 2008.

PERSONAL DETAILS

Date of Birth: May 18, 1986.
Marital Status: Married.
Citizenship: Indian.

PERMANENT HOME ADDRESS

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H. No. 2-195/12, Barlagudem Village,
Ponnekal post,
Kamepalli mandal, Khammam District,
Telangana - 507 210, India.
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