

# LIZY ABRAHAM, Ph.D.

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## CONTACT INFORMATION

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Trivandrum, Kerala, India

26 May 1983

PIN – 695587.

## EXPERTISE & INTERESTS

Machine Learning, Wireless Sensor Networks, IoT, Embedded Systems,  
Image Processing, Biomedical imaging, Indoor Localization, Remote Sensing

## EDUCATIONCAL QUALIFICATIONS

**CONNECT, Science Foundation Ireland Research Centre for Future  
Networks & Communications**, Dublin, Ireland

Post-Doctoral Fellowship in Wireless Sensor Networks, June 2016 – Dec  
2017

- Supervisor: Dr. Brendan O’Flynn

**Kerala University**, Trivandrum, Kerala, India

Ph.D. in Electronics & Communication Engg, Jan 2011 – April 2015

- Thesis: Study and Analysis of Satellite Images for the Extraction of  
Structural Features
- Supervisor: Pr.(Dr).M.Sasikumar

**Anna University**, Chennai, India

Master of Engineering in Communication Systems, June 2004 – March 2006

**Mahatma Gandhi University College of Engineering**, Kerala, India

Bachelor of Technology in Electronics & Communication Engineering, June  
2000 – March 2004

## PROFESSIONAL EXPERIENCES

**Tyndall National Institute, University College Cork**, Cork, Ireland

Postdoctoral Researcher/ Research Engineer, June 2016 – December 2017

- Supervisor: Dr. Brendan O’Flynn
- European Union RAMBUS Project, June 2016 – December 2017

**ABJ Abdul Kalam Technological University**, Kerala, India

Research Supervisor, July 2018 – Present

Guiding three Ph.D. students in the areas of Machine Learning/ Deep  
Learning and Wireless Sensor Networks:

- Sabeena M (**Project Title:** Face Recognition in Low Resolution Images using Signal Processing and Deep Learning Techniques with Face-part Detection for Forensic Applications)
- Anju S Mohan (**Project Title:** Machine Learning Techniques for the Prediction & Analysis of Real Time Air Quality Monitoring)
- Ann Nita Netto (**Project Title:** Deep Neural Networks for Anomaly Detection and Fault Prediction in Wireless Body Area Networks) [Obtained funding]

**Dean (Research & Consultancy)**

LBS Institute of Technology for Women, Poojappura, Trivandrum, Kerala, July 2018 – Present

**FOUNDER & DIRECTOR**

**Liz Intelligent Solutions Pvt. Ltd., Trivandrum, Kerala**

Developing intelligent embedded products and providing software services

**INDUSTRIAL EXPERIENCE**

- **Elsys Intelligent Devices Pvt. Ltd,** Technopark Campus, Kazhakootam, Trivandrum, Kerala
- Technical Support and Guidance, Research Proposal Preparation, Trouble shooting

**FUNDED PROJECTS**

**Monitoring & Analysis of Simulated Spacecraft Parameters for Satellite Launch Vehicles** (Sept 2013 – Dec 2014)

- Design of independent embedded modules using MEMS sensors for the navigation systems of Launch Vehicles with the technical support from VSSC

**An Intelligent Pollution Monitoring System** for implementing in Chala Market, Trivandrum (Jan 2018 – June 2019)

**An intelligent Crop Field Monitoring** with Automated Irrigation & Temperature Control System (Jan 2018 – June 2019)

**ONGOING FUNDED PROJECTS**

**Deep Neural Networks for Anomaly and Fault Prediction in Wireless Body Area Networks** (3 year project, started on June 2019)

- To develop an effective methodology to tackle lost data and faulty data in a WBAN and to detect the anomalies with minimum false alarm rate as it may cause danger to life.
- To explore the possibility of developing light weight systems that can detect anomalies in vitals and ECG concurrently.

**INVENTORY DISCLOSURE FORMS (IDFs)**

- Machine Learning Algorithms for Gesture Recognition using Lensless Smart Sensors

- Tracking Multiple Light Points Simultaneously and Estimating Hand Location & Orientation using Lensless smart Sensors
- Single Point Detection and Tracking in 3D using Lensless Sensors

## AWARDS & RECOGNITIONS

- Got appointment as Assistant Director at APJ Abdul Kalam Kerala Technological University (KTU)
- Shortlisted for KTU Researcher of the Year Award 2018
- Included in the KTU Curriculum committee and Audit team
- Best Paper Award for the paper ‘3D Ranging and Tracking using an Improved Lensless Smart Sensor’, in the 14th International Conference on Information Processing, IEEE, Dec. 2018, Bangalore, India
- Telecasted in the media ‘Word to World’ in their program ‘Women who have Excelled’  
<https://www.youtube.com/watch?v=SFEVRZYXPYA>
- Prototype system developed as part of fellowship ‘Virtual Drawing Hand Controller’ is recognized by Science Foundation Ireland and Tyndall National Institute  
[https://twitter.com/connect\\_ie/status/928969898566602753](https://twitter.com/connect_ie/status/928969898566602753)  
<https://twitter.com/TyndallInstitut/status/911295242325897216>
- Interviewed by Ireland Youth Media for the research  
<https://audioboom.com/posts/6019143-interview-with-lizy-abraham>
- II Prize winner for the 3 minutes video presentation conducted by Science foundation Ireland for the researchers  
<https://www.youtube.com/watch?v=IPhZx6AtiJU&t=20s>
- Selected as Young Woman in Engineering for the Venus International Women Awards-VIWA 2018  
<http://viwa.info/2018/engineering/electronics/lizy.html>
- Included in Marquis Who's Who in the World(32<sup>nd</sup> Edition), world’s leading publisher of biographical resources listing people who have notable achievements
- Opportunity to Visit NASA by getting Govt. of India Travel Grant for presenting the research paper in the American Society for Photogrammetry and Remote Sensing (ASPRS) International Remote Sensing Symposium (PECORA 19) on “Sustaining Land Imaging: UAS to Satellites” conducted by NASA, ISPRS, IAG and the U.S. Geological Survey at Denver, Colorado, USA on November 2014.
- Govt. of India Travel Grant for presenting the research paper in the International Conference on Advances Science and Contemporary Engineering (ICASCE 2012) at Bina Nusantara University, Jakarta, Indonesia on October 2012.

## BOOKS PUBLISHED

- **Lab Manual on LabVIEW**, Scitech Publications, Chennai (ISBN No: 978-81-8371-395-5, Published on August 2011)
- **Automatic Extraction of Structural Features from Satellite Images - Algorithm, Analysis and Applications**, LAP LAMBERT Academic Publishing, Germany (ISBN No: **978-3-659-30322-7**, Published on November 2012)
- **Campus Game**, Saketham Publications, Kerala (ISBN No: 978819281-5, published on March 2016)

## BOOK CHAPTERS

- Lizy Abraham and M. Sasikumar, 'Cloud Extraction and Removal in Aerial & Satellite Images', ISSN: 2194-5357, Vol. 182, pp. 341-347, Springer-Verlag Berlin Heidelberg, 2013.
- Lizy Abraham and M. Sasikumar, 'A Fuzzy based Automatic Bridge Detection for Satellite Images', ISSN 1865-0929, Vol. 292, pp. 213-219, Springer-Verlag Berlin Heidelberg, 2012.

## PAPERS PRESENTED ABROAD

- N.Normani, **Lizy Abraham** et al., 'A Machine Learning Approach for Gesture Recognition with a Lensless Smart Sensor System', *IEEE Body Sensor Networks (BSN 2018)*, March 2018, Las Vegas, USA, pp.1-4.
- **Lizy Abraham** et al., 'Point Tracking with Lensless Smart Sensors', *IEEE Sensors 2017*, October 2017, Scotland, UK, pp. 1-3.
- **Lizy Abraham** et al., '3D Ranging and Tracking using Lensless Smart Sensors', International Conference on Smart Systems Integration (SSI 2017), March 2017, Cork, Ireland, pp. 1-8.
- Renjith Das, **Lizy Abraham** et al., "Vibration Monitoring and Analysis of Sophisticated Items Transported by Road", IEEE International Conference on Sensors & Nanotechnology, July 2019, Pulau Pinang, Malaysia.
- **Lizy Abraham**, M. Sasikumar, 'Vehicle Detection and Classification from High Resolution Satellite Images', *ISPRS International Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, ISSN: 2194-9042, Denver, Colorado, USA, Nov.2014, vol.2, no.1, pp.1-8.
- **Lizy Abraham**, M. Sasikumar, 'Automatic Building Extraction from Satellite Images using Artificial Neural Networks', *International Conference on Advances Science and Contemporary Engineering 2012 (ICASCE 2012)*, Elsevier, October 24 - 25, 2012, Jakarta, Indonesia, ISSN 1877-7058, vol.50, pp. 893-903.

<https://scholar.google.co.in/citations?user=NHdjb5YAAAAJ&hl=en>

- **Lizy Abraham** et al., “Hand Tracking and Gesture Recognition using Lensless Smart Sensor”, *Sensors Journal*, ISSN: 1424-8220, pp. 118 – 127, vol.18, no.9, 2834, pp.1-24, August 2018.
- **Lizy Abraham** et al., ‘Forecasting Atmospheric PM2.5 Concentration in Thiruvananthapuram City using LSTM Model’, 5<sup>th</sup> *International Conference on Image Information Processing, IEEE*, Nov. 2019, Himachal Pradesh, India.
- **Lizy Abraham** et al., ‘A Low Cost Automated Medicine Unit’, 5<sup>th</sup> *International Conference on Computing, Communication and Networking Technologies*, *IEEE*, July 2019, IIT Kanpur, India.
- **Lizy Abraham** et al., ‘3D Ranging and Tracking using an Improved Lensless Smart Sensors’, 14<sup>th</sup> *International Conference on Information Processing, IEEE*, Dec. 2018, Bangalore, India.
- **Lizy Abraham**, M.Sasikumar, “Analysis of Satellite Images for the Extraction of Structural Features”, *IETE Journal of Technical Review*, ISSN: 0256-4602, pp. 118 – 127, vol.31, no.2, April 2014.
- **Lizy Abraham**, M. Sasikumar, ‘An Automatic Shadow Segmentation Method for High Resolution Satellite Images’, *AMSE Journal of Signal Processing and Pattern Recognition*, ISSN: 1240-4543, vol.56, no.4, 2013.
- **Lizy Abraham**, Shayama Subair, ‘LabVIEW based Modelling and Analysis of Temperature Sensors’, *IEEE International Conference on Computational Systems and Communications*, Trivandrum, Kerala, ISBN: 978-1-4799-6012-5, pp. 277 - 281.
- **Lizy Abraham**, Aarathy Babu. M, ‘Analysis of MEMS gyro sensors ADXRS 450 and ADXRS 649 Using LabVIEW’, *IEEE International Conference on Computational Systems and Communications*, Trivandrum, Kerala, ISBN: 978-1-4799-6012-5, pp.144-149.
- **Lizy Abraham**, M. Sasikumar, ‘An Efficient Shadow Detection method for High Resolution Satellite Images’, *IEEE International Conference on Computing, Communication & Networking Technologies (ICCCNT 2012)*, July 26 – 28, 2012, Coimbatore, India, ISBN: 978-1-46735-693-0, pp. 1 - 5.
- **Lizy Abraham**, M. Sasikumar, ‘A Fuzzy based Road Network Extraction from Degraded Satellite Images’, *IEEE International Symposium on Women in Computing and Informatics (WCI-2013)*, August 23-24, 2013 in Mysore, India, ISBN: 978-1-4799-2432-5, pp. 2032 - 2036.
- **Lizy Abraham**, M. Sasikumar, ‘Unsupervised Building Extraction from High Resolution Satellite Images Irrespective of Rooftop Structures’, *International Journal of Image Processing (IJIP)*, ISSN:

1985-2304, vol.6, no.4, pp. 219-232, August 2012. (IF: 0.32,

- **Lizy Abraham, M. Sasikumar,** ‘Detection of Bridges using different types of High Resolution Images’, International Journal on Recent Trends in Engineering & Technology (ACEEE), vol.10, no.2, pp. 107-112, Jan. 2014.

#### MS INTERNSHIP PROJECT GUIDED (OUTSIDE INDIA)

- A Machine Learning Approach to Classify Gestures in a Desk Mounted Hand Tracking System’, Niccolo’ Normani, M.S. in Automation Engineering, University of Padova, Italy  
(Prepared Project Plan and has been his Research Supervisor)

#### TEACHING EXPERIENCE

- **LBS Institute of Technology for Women, Kerala, India**  
Assistant Professor, February 2008 – June 2016, Dec 2017 – Present
- **Lourdes Matha College of Science & Technology, Kerala, India**  
Lecturer, June 2006 – February 2008

#### MISCELLANEOUS

- Experience in writing research proposals – the research proposal submitted for EDGE Marie Skodowska-Curie Fellowship entitled ‘Greenhouse Gases and Climate Changes’ is selected for the final level of Interview.
- Included in the Reviewer database of *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* and *IEEE Sensors Journal* and reviewed papers of many other conferences.

#### REFERENCES

Dr. Michael Walsh  
Wireless Sensor Networks Group, Micro & Nano Systems Centre  
Tyndall National Institute, University College Cork  
Lee Maltings, Dyke Parade, Cork, Ireland  
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