Anju Jose Tom, Post Doctoral Fellow

Major Areas: Computer Vison (Object Detection from videos)
Deep Learning (for Large Scale Image Compression)
Post Doctoral Fellow, Inria Bretagne, France
Living in Rennes, France
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Education

- **National Institute for Research in Digital Science and Technology, Rennes** — Inria, SIROCCO
  Post Doctoral Fellowship — *Sept. 2020 – Aug 2022*
- **National Institute of Technology, Calicut** — CGPA: 8.75
  Ph.D in Electronics & Communication Engineering. — *Dec. 2016 – May 2020*
- **College of Engineering, Cherthala** — CGPA: 9.4
  Master of Technology in Signal Processing. — *Aug. 2014 – May 2016*
- **Saintgits College of Engineering, Kottayam** — CGPA: 8.6
  Bachelor of Technology in Applied Electronics and Instrumentation. — *Aug. 2010 – May 2014*
- **St. George Higher Secondary School, Kattappana** — 95 %
  Higher Secondary Education. — *July 2008 – July 2010*

PROJECTS

- **DAta REpurposing (DARE)**: A new compression paradigm for large-scale image and video databases. It is nothing but changing the initial data format for another type of visualization in a more compact representation, thus leading to drastic compression ratios. (Two research manuscripts are under preparation as part of this project.)
- **Collaborator**: Dr. Thomas Maugey, Research Scientist, Team SIROCCO, Inria

Research

- **Ph.D** — NIT, Calicut
  Research Supervisor: ***Dr. Sudhish N. George****, Asst. Professor, NITC* — ***Thesis Defence: 26 May 2020***
  - **Thesis Title:** Design of Moving Object Detection Schemes for Challenging Surveillance Environments
  - **Problem Statement:** To design and implement algorithms for moving object detection from surveillance videos which are capable of addressing dynamic background, noisy video data, incomplete video data, subsampled video data and low resolution video data.
  - **Research Publications**
    1. **Anju Jose Tom**, Sudhish N. George, "A three way optimization technique for noise robust moving object detection using tensor low rank approximation, $l_{1/2}$ and TTV Regularizations", *IEEE Transactions on Cybernetics*, Print ISSN: 2168-2267, Online ISSN: 2168-2275, DOI: TCYB.2019.2921827, 2019.
    2. **Anju Jose Tom**, Sudhish N. George, "Simultaneous reconstruction and moving object detection for wireless multimedia sensor networks based surveillance systems", *IEEE Transactions on Image Processing*, DOI: 10.1109/TIP.2020.3004696, June, 2020.
    3. **Anju Jose Tom**, Sudhish N. George, "Video completion and simultaneous moving object detection for extreme surveillance environments", *IEEE Signal Processing Letters*, 2019, vol 26, pp:577-581.
    4. Shijila B, **Anju Jose Tom**, Sudhish N. George, "Simultaneous denoising and moving object detection using low rank approximation", *Future Generation Computer Systems*, Elsevier, 2019, vol 90, pp:198-210.

5. Shijila B, **Anju Jose Tom**, Sudhish N. George, "Moving object detection by low rank approximation and l_1-TV regularization on RPCA framework", *Journal of Visual Communication and Image Representation*, Elsevier, 2018, vol 56, pp:188-200.
6. **Anju Jose Tom**, Sudhish N. George, "Video super resolution and joint moving object detection from low-res surveillance videos", *IEEE Transactions on Cybernetics* (under review).

- **Conferences**
  1. **Anju Jose Tom**, Sudhish N. George, "Tensor Total Variation Regularized Moving Object Detection for Surveillance Videos", in *IEEE Int. Conf. on Signal Processing and Communication (SPCOM 2018)*, pp: 327-331, IISc, Bangalore, India, 2018.

Post Graduation

- **M.Tech - Signal Processing** — CEC, Cherthala
  Project Title: Ripplet Transform based Medical Image Compression — *Aug.2014 - Aug.2016*
  - **Objective**: To design and implement algorithms for Medical Image Compression using Ripplet Transform.

Under Graduation

- **B.Tech** — Saintgits, Kottayam
  Project Title: SMART ROOM using LabVIEW — *Jul. 2010 - May 2014*
- **Awards and Certifications**
  - Prize for Outstanding Student Performance, Department of AEI & PTA, Saintgits College of Engineering
  - Prize for best mini project, Department of AEI, Saintgits College of Engineering
  - Certified LabVIEW Associate Developer (CLAD) (Awarded by National Instruments Corporation.)

Workshops/Faculty Development Programme (FDP)s Attended

1. Computational Imaging with Novel Image Modalities(CLIM) workshop at INRIA-Rennes (2021 September 29-30)
2. TEQUIP Sponsored Workshop on Optimization Techniques (2016 March 21-23) at CEC Cherthala.
3. FDP on Estimation and Detection Theory (2016 Feb 10-12) at College of Engineering Cherthala.
4. FDP on Linear Algebra for Engineers (2015 Nov 24-26) at College of Engineering Cherthala.
5. FDP on Research Trends in Semiconductor Device Modeling and Fabrication (2014 Dec 8-12).
6. TEQUIP Sponsored Workshop on Relevance of Vedic Mathematics in Engineering (2014 Nov).
7. Accelero-Botix,a Workshop conducted by Technophilia systems in Association with Robotics and computer Applications Institute of USA held at Saintgits College of Engineering, Kottayam (2012 Oct 5-6).
8. Xilinx based FPGA Design Workshop conducted by IEEE student branch at Saintgits College of Engineering,Kottayam (2013 Dec 16).
9. TEQUIP sponsored workshop on Optoelectronics (2015 Feb 15) at College of Engineering,Cherthala.
10. TEQIP III sponsored Faculty Development Programme on Research Trends in Multimedia and Multirate Signal Processing (24th-29th June, 2019) at NIT Calicut handled by faculties from IIT Bombay.

Technical Tools and Skills

1. C, C++, Git, Python, Pycharm, Pytorch Matlab
2. CV/ML tools such as OpenCV
3. Knowledge & know-how in computer vision (detection, segmentation, classification/recognition, detection, OCR, real-time image processing, etc.)
4. Knowledge & know-how in digital signal processing

Membership in Professional Organizations and Editorial Experience

1. Member of Institute of Electrical and Electronics Engineers (IEEE)
2. Member of International Society of Automation (ISA)
3. Reviewer for IEEE Transactions on Intelligent Transportation Systems (ITS) and IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)

Teaching Experience/Research Project Supervision

1. Assistant Professor of Bachelors in Electronics at CCST College of Science and Technology, Palakkad, Kerala, India. Single Semester: Jun. 2016 - Nov. 2016
   Subjects Handled : Basic Electronics, Digital Electronics.
2. Teaching assistance during Masters at College of Engineering, Cherthala, India. Four Semesters: Jun. 2014 - May. 2016
3. Master Project Co-supervision during Ph.D at NIT Calicut, India. Two Semesters: Jun. 2017 - Jun. 2018
4. Master Project Co-supervision at Inria-Rennes, France. One Semester: Feb. 2021 - July. 2021

Relevant Courses

- Linear and Non linear Optimization.
- Pattern Recognition
- Image and Video Processing
- Wavelets: Analysis and Design

Personal Profile

- Date of birth: 03 June 1992
- Marital status: Married
- Name of spouse: Mr. Justin George, Name of son: Joris Justin George (8 months)
- **Home address (for communication)**: 12 A Rue des Plantes, Apartment 242, 35700 Rennes, France.

REFERENCES

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