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Winter 11-1-2022

Diagnosis of Osteoporosis from radiographs using Image processing and Deep learning techniques

Anu Shaju Areeckal

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Dr. Anu Shaju Areeckal

B.Tech., M.Tech., Ph.D.

Assistant Professor,
Department of ECE,
Manipal Institute of Technology,
Manipal Academy of Higher Education,
Udupi, Karnataka- 576104



LinkedIn profile: <https://www.linkedin.com/in/anu-shaju-areeckal-3b3933aa/>

Google scholar profile: <https://scholar.google.com/citations?hl=en&user=XKRynH4AAAAJ>

Scopus author profile: <https://www.scopus.com/authid/detail.uri?authorId=55201348400>

ORCID profile: <https://orcid.org/0000-0003-2939-822X>

Research Areas of Interest:

Image processing, Computer vision, Machine learning, Deep learning

Awards:

1. Certificate of Excellence awarded by Samsung India on 14th November 2021, for the Samsung-PRISM (Preparing and Inspiring Student Minds) project on Noise reduction, Multi-frame- Astrophotography, conducted from December 2020 to May 2021.
2. Special Mention of the Jury Award for the year 2019 in ECE, Board for Information Technology Education Standards (BITES) Best PhD thesis award ceremony held at RNS Institute of Technology, Bangalore, India, on 23rd February, 2021.
3. Fourth Best PhD Thesis award in Graduate Congress: GRATE'7' (Graduate Thesis Evaluation in 7 minutes), jointly organized by IEEE ComSoc Bangalore, Hyderabad and Kerala chapters, held as virtual event on 13th June, 2020.
4. SRISTI-Gandhian Young Technological Innovation (GYTI) Award 2019, organized by SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) at Vigyan Bhavan, Delhi, India, on 6th July, 2019.
5. Second position at the Graduate Student Day Workshop, 25th National Conference on Communications (NCC), at Indian Institute of Science (IISc), Bangalore, India, on 21st February, 2019.

Publications:

Refereed International Journals:

1. **Anu Shaju Areeckal**, Michel Kocher and Sumam David S. (2019), "Current and emerging diagnostic imaging-based techniques for assessment of osteoporosis and fracture risk", *IEEE Reviews in Biomedical Engineering*, vol.12, no.1, pp. 254-268, DOI: 10.1109/RBME.2018.2852620, **Scopus indexed**.
2. **Anu Shaju Areeckal**, Jagannath Kamath, Sophie Zawadynski, Michel Kocher and Sumam David S. (2018), "Combined radiogrammetry and texture analysis for early diagnosis of osteoporosis using Indian and Swiss data", *Computerized Medical Imaging*

and Graphics, Elsevier, vol.68, no.9, pp.25-39, DOI: 10.1016/j.compmedimag.2018.05.003, SCIE/WoS/Scopus indexed.

3. **Anu Shaju Areeckal**, Nikil Jayasheelan, Jagannath Kamath, Sophie Zawadynski, Michel Kocher, and Sumam David S. (2018), "Early diagnosis of osteoporosis using radiogrammetry and texture analysis from hand and wrist radiographs in Indian population", *Osteoporosis International, Springer Nature*, vol.29, no.3, pp.665-673, DOI: 10.1007/s00198-017-4328-1, **SCI/WoS/Scopus indexed.**

Refereed International Conferences:

1. Harsh Gupta, Dhruv Balkrishna Salvadi, **Anu Shaju Areeckal**, and Sujay Udupa (2022), "Star identification in night sky images using mobile phone camera", *2022 IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES)*, IEEE, vol. 1, pp. 314-319, **Scopus indexed.**
2. Ishan Devdatt Kawathekar and **Anu Shaju Areeckal** (2022), "Performance analysis of texture characterization techniques for lung nodule classification", *Journal of Physics: Conference Series 2022, IOP Publishing*, vol.2161, no.1, p.012045, DOI:10.1088/1742-6596/2161/1/012045, **Scopus indexed.**
3. Konduri Praveen Mahesh, Shaik Ashar Afrouz and **Anu Shaju Areeckal** (2022), "Detection of fraudulent credit card transactions: A comparative analysis of data sampling and classification techniques", *Journal of Physics: Conference Series 2022, IOP Publishing*, vol.2161, no.1, p.012072, DOI:10.1088/1742-6596/2161/1/012072, **Scopus indexed.**
4. Mehul Arora, Sarthak Naithani and **Anu Shaju Areeckal** (2022), "A web-based application for face detection in real-time images and videos", *Journal of Physics: Conference Series 2022, IOP Publishing*, vol.2161, no.1, p.012071, DOI:10.1088/1742-6596/2161/1/012071, **Scopus indexed.**
5. Rakshith Kamath and **Anu Shaju Areeckal** (2020), "Semi-automated estimation of spinal curvature from scoliosis radiographs using difference matrix," *2020 IEEE International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics (DISCOVER)*, Udupi, India, pp.147-152, October 30-31, 2020, DOI:10.1109/DISCOVER50404.2020.9278054, **Scopus indexed.**
6. Avinash D. Jayakar, Gautham Sambath, **Anu Shaju Areeckal** and Sumam David S. (2018), "Cortical volumetry using 3D reconstruction of metacarpal bone from multi-view images", *4th IEEE International Conference on Recent Advances in Computational Systems (RAICS)*, Thiruvananthapuram, India, pp.79-83, December 6-8, 2018, DOI: 10.1109/RAICS.2018.8635067, **Scopus indexed.**
7. **Anu Shaju Areeckal**, Mathew Sam, and Sumam David S. (2018), "Computerized radiogrammetry of third metacarpal using watershed and active appearance model", *19th IEEE International Conference on Industrial Technology (ICIT)*, Lyon, France, pp.1490-1495, February 20-22, 2018, DOI: 10.1109/ICIT.2018.8352401, **Scopus indexed.**
8. Mathew Sam, **Anu Shaju Areeckal**, and Sumam David S. (2017), "Early diagnosis of osteoporosis using active appearance model and metacarpal radiogrammetry", *13th IEEE International Conference on Signal Image Technology and Internet Based*

Systems (SITIS), Jaipur, India, pp.173-178, December 4-7, 2017, DOI: 10.1109/SITIS.2017.38, **Scopus indexed**.

9. **Anu Shaju Areeckal**, Sumam David S., Michel Kocher, Nikil Jayasheelan, and Jagannath Kamath (2016), “Fully automated radiogrammetric measurement of third metacarpal bone from hand radiograph”, *11th IEEE International Conference on Signal Processing and Communication (SPCOM)*, Bangalore, India, pp.1-5, June 12-15, 2016, DOI: 10.1109/SPCOM.2016.7746608, **WoS/Scopus indexed**.
10. P. Manikandan, and **Anu Shaju Areeckal** (2012), “A novel CMOS low noise amplifier for UWB application”, *2nd International Conference on Advanced Computing and Communication Technologies (ACCT)*, IEEE, Rohtak, India, pp.450-453, January 7-8, 2012, DOI: 10.1109/ACCT.2012.8, **Scopus indexed**.