AI Cancer Research Center at Department of ECE, KLS Gogte Institute of Technology, Belagavi

The AI Cancer Research Center at the Department of Electronics and Communication Engineering, KLS Gogte Institute of Technology, Belagavi, is at the forefront of the integration of AI into Pathology and Radiology data image understanding and analysis, revolutionizing cancer diagnosis and treatment. AI algorithms have been harnessed to accurately detect and classify cancerous cells and tumors in medical images, enabling early detection and more precise diagnoses. This powerful combination of AI and medical imaging has significantly improved the efficiency and accuracy of cancer care, bringing us closer to better patient outcomes and a future with reduced cancer burden.

Our Research Collaborations and Initiatives

- **Institute Elective:** We offer an institute elective titled "Bio Medical Image Understanding and Analysis" to 5th-semester undergraduate students in Electrical and Computer Science. Since its inception in 2021, the elective continues to thrive with a practical approach and a clinical focus, providing students with valuable hands-on experience in AI-driven biomedical imaging research.
- **Internships:** Several undergraduate students have completed their internships at KLE Hospital, while others are currently continuing their research under the mentorship of Dr. Anil B. Gavade. These internships serve as a platform for nurturing young talent and fostering innovation in cancer research.
- **Undergraduate Projects:** Two ambitious undergraduate projects were successfully completed during the academic year 2022-2023, contributing to advancements in Explainable AI, Human-Centered AI, Computer Vision, and Machine Perception.
- **PhD Research Scholars:** Our research center is proud to host two exceptional PhD students who are currently working on Explainable AI and Biomedical Imagery Research. Their dedication and expertise play a crucial role in furthering our understanding of AI's potential in cancer diagnosis and treatment.
- **Ongoing Project: Prostate Cancer Diagnosis using AI**
  An ongoing project focuses on the application of AI in the diagnosis of Prostate Cancer (PCa). The project utilizes multi-parametric Magnetic Resonance Imaging (mpMRI) scans and Digital Pathology to accurately predict PCa recurrence after radical prostatectomy. The research team analyses Histology slides (tissue images) and mpMRI scans to determine the case vs. control status (recurrent vs. non-recurrent) of a cohort through post-treatment follow-up. By leveraging AI-driven predictive models, the project aims to identify novel biomarkers for PCa recurrence, enhancing the precision and accuracy of cancer diagnosis.

Our Team


Urinary Biomarkers
Research Centre
RT-PCR LABORATORY
CME IN URO-ONCOLOGY


PRABHAKAR

List of Publications

The research conducted at the AI Cancer Research Center has resulted in several impactful publications in reputable journals and participation in international conferences. Some of the key publications include:

1. Rajendra B. Nerli, **Anil B. Gavade**, "**Comparing 3D U-Net and no-new-Net for Prostate Cancer Segmentation and Classification of Peripheral Zone and Central Gland Regions in mpMRI**", presented at the **43rd Congress of Société Internationale d'Urologie (SIU), October 2023, Istanbul, Turkey**.
2. **Anil B. Gavade**, Rajendra B. Nerli, Pushkar Bansidhar Patil, Richa Ravi Siddannavar, Priyanka A. Gavade, and Venkata Siva Prasad Bhagavatula, "Prostate Cancer Segmentation of Peripheral Zone and Central Gland Regions in mpMRI: Comparative Analysis with Deep Neural Network U-net and its advanced Models", published in the IOP book "Image processing with Python: Vol 2 A," IOP Publisher [**Scopus-Indexed, Accepted June 2023 – In press**].
3. **Anil B. Gavade**, Rajendra B. Nerli, Neel Kanwal, Priyanka A. Gavade, Shridhar Sunilkumar Pol, and Syed Tahir Hussain Rizvi, "**Automated Diagnosis of Prostate Cancer Using mpMRI Images: A Deep Learning Approach for Clinical Decision Support**", published in "Computers," Volume 12, Issue 8, 2023 [**SCI – Q2 Indexed, IF-2.8**].
4. **Anil B. Gavade**, Rajendra B. Nerli, Shridhar Ghagane, Priyanka A. Gavade, and Venkata Siva Prasad Bhagavatula, "**Cancer cell detection and classification from digital whole slide image**," published in "Smart Technologies in Data Science and Communication: Proceedings of SMART-DSC 2022," Singapore: Springer Nature Singapore, 2023 [**Scopus-Q4 Indexed**].
5. **Anil B. Gavade**, Rajendra B. Nerli, Ashwin Patil, Shridhar Ghagane, Venkata Siva Prasad Bhagavatula, "**Computational Intelligent Paradigms in Radiological Image Processing - Recent Trends and Challenges**," a book chapter published in "Emerging Computing Paradigms: Principles, Advances and Applications," Wiely, June/July 2022.
6. **Anil B. Gavade**, Rajendra B. Nerli, Ashwin Patil, Shridhar Ghagane, "**Coronavirus (COVID-19) Detection and Classification using High Resolution Computed Tomography (HR-CT) Imageries**," published in "Advances in Intelligent Systems and Computing," Springer, Jan 2022 [**Scopus-Q4 Indexed**].
7. **Anil B. Gavade**, Rajendra B. Nerli, and Shridhar Ghagane, "**Lesion Detection and Classification Using Semantic Deep Segmentation Network**," published in "Smart Technologies in Data Science and Communication," Springer, Singapore, June 2021 [**Scopus-Indexed**].

Join Us in Advancing Cancer Research

At the AI Cancer Research Center, we believe in collaboration, innovation, and driving advancements in the field of cancer research. We welcome passionate individuals, researchers, and industry partners to join us in our quest for a cancer-free future. For inquiries, collaborations, and more information, please contact us using the details provided below.

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