Digital Health Technologies in Breast Cancer Management

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ABSTRACT:

Breast cancer remains the most frequently diagnosed malignancy among women worldwide and continues to be a leading cause of cancer-related morbidity and mortality despite substantial advances in screening, molecular diagnostics, targeted therapies, and precision medicine. The rapid evolution of digital health technologies has transformed breast cancer care by enabling more personalized, data-driven, and patient-centered management throughout the entire continuum of care. Artificial intelligence (AI), telemedicine, wearable biosensors, mobile health applications, digital pathology, electronic health records, cloud computing, digital therapeutics, remote patient monitoring, and digital twin technologies are increasingly integrated into breast oncology to improve early detection, diagnosis, treatment planning, therapeutic monitoring, survivorship care, and clinical decision support. Machine learning, deep learning, computer vision, multimodal learning, natural language processing, and predictive analytics facilitate automated analysis of radiological imaging, genomic sequencing, pathology, laboratory investigations, and longitudinal clinical data, thereby supporting precision medicine. Furthermore, digital platforms improve healthcare accessibility, multidisciplinary collaboration, patient engagement, and real-time monitoring while reducing healthcare costs and optimizing clinical workflows. Despite these advances, challenges remain regarding interoperability, cybersecurity, patient privacy, digital literacy, algorithmic bias, regulatory oversight, and equitable implementation. This review discusses the evolving role of digital health technologies in breast cancer management, highlighting current clinical applications, emerging innovations, implementation challenges, and future perspectives for digitally enabled precision breast oncology.[1]

Keywords: Digital health, Breast cancer, Artificial intelligence, Telemedicine, Wearable devices, Precision oncology, Mobile health, Digital pathology, Clinical decision support, Personalized medicine.

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I. Introduction

Breast cancer is one of the most extensively studied malignancies and remains the leading cancer diagnosed among women worldwide. Improvements in mammographic screening, molecular diagnostics, targeted therapies, endocrine therapy, immunotherapy, and multidisciplinary clinical management have substantially improved survival. Nevertheless, breast cancer continues to present major clinical challenges because of its biological heterogeneity, diverse molecular subtypes, variable therapeutic responses, and long-term survivorship needs.[2]

The widespread adoption of digital health technologies has fundamentally transformed healthcare delivery by enabling continuous integration of clinical information across diagnosis, treatment, follow-up, and survivorship. Digital platforms generate enormous volumes of biomedical data through medical imaging, wearable sensors, electronic health records, mobile health applications, laboratory investigations, genomic sequencing, and patient-reported outcomes. These technologies provide unprecedented opportunities for individualized patient management while supporting more efficient healthcare delivery.[3]

Artificial intelligence has become one of the principal drivers of digital transformation within breast oncology. Machine learning, deep learning, and multimodal computational models analyze complex biomedical datasets that exceed conventional analytical capabilities, supporting early diagnosis, prognostic prediction, therapeutic optimization, toxicity assessment, and long-term disease monitoring.[4]

The convergence of digital health technologies and precision medicine is creating an increasingly connected breast cancer care ecosystem in which clinicians, patients, diagnostic laboratories, imaging facilities, and healthcare information systems collaborate through continuous digital communication and evidence-based clinical decision support.[5]

2. Evolution of Digital Health in Breast Oncology

Digital transformation within breast oncology has progressed from isolated electronic medical record systems toward highly integrated healthcare ecosystems. Early digital applications primarily focused on computerized patient records and basic hospital information systems that improved documentation and administrative efficiency.[6]

Subsequent advances in medical imaging, cloud computing, artificial intelligence, wearable technologies, and mobile communication expanded digital healthcare capabilities beyond hospital environments. Telemedicine, remote patient monitoring, digital pathology, and electronic prescribing became increasingly important during routine oncology care, particularly following widespread adoption of virtual healthcare services.

More recently, artificial intelligence, multimodal data integration, digital therapeutics, digital twins, and real-time predictive analytics have enabled continuously learning healthcare systems capable of supporting personalized breast cancer management throughout diagnosis, treatment, and survivorship.[7]

Today, digital health technologies represent essential components of modern breast oncology, facilitating collaboration among multidisciplinary clinical teams while improving patient access to specialized cancer care.

3. Artificial Intelligence as the Foundation of Digital Breast Oncology

Artificial intelligence provides the computational foundation supporting many digital health applications in breast cancer management. Machine learning algorithms identify statistical relationships between clinical variables and patient outcomes, enabling prediction of diagnosis, recurrence, survival, therapeutic response, and treatment-related toxicity.[8]

Deep learning substantially improves diagnostic performance through automated interpretation of mammography, breast ultrasound, magnetic resonance imaging, digital pathology, and molecular datasets. Convolutional neural networks accurately identify breast lesions, classify tumor subtypes, estimate disease extent, and monitor treatment response.

Natural language processing extracts clinically relevant information from pathology reports, radiology reports, physician documentation, multidisciplinary meeting records, and electronic health records. Multimodal learning further integrates imaging, genomics, pathology, laboratory investigations, wearable sensor data, and clinical documentation into comprehensive patient-specific computational models supporting precision medicine.[9]

4. Digital Imaging and AI-Assisted Breast Cancer Screening

Breast cancer screening remains one of the most successful public health interventions for reducing cancer mortality through early detection. Digital mammography, digital breast tomosynthesis, ultrasound, magnetic resonance imaging, and contrast-enhanced mammography generate large quantities of diagnostic information suitable for artificial intelligence analysis.[10]

Deep learning algorithms automatically detect suspicious masses, microcalcifications, architectural distortion, focal asymmetry, and interval changes while assisting radiologists in prioritizing examinations requiring immediate clinical attention. AI improves sensitivity, reduces observer variability, and enhances workflow efficiency within breast imaging departments.

Risk prediction models further integrate imaging findings with demographic characteristics, family history, breast density, genetic susceptibility, hormonal exposure, and lifestyle factors to support individualized screening strategies tailored to each patient's level of risk.[11]

5. Digital Pathology and Molecular Diagnostics

Digital pathology has become an essential component of digital breast oncology through conversion of conventional microscope slides into ultra-high-resolution whole-slide images suitable for computational analysis. Artificial intelligence evaluates millions of microscopic tissue regions simultaneously, providing objective assessment of tumor morphology, histological grade, lymphovascular invasion, immune infiltration, stromal remodeling, and tumor heterogeneity.[12]

Deep learning models accurately classify breast cancer subtypes, estimate recurrence risk, identify lymph node metastasis, and predict molecular biomarkers including estrogen receptor (ER), progesterone receptor (PR), HER2 status, and Ki-67 proliferation index directly from routine histopathological images.

Digital pathology also facilitates remote consultation, multidisciplinary collaboration, educational activities, quality assurance, and standardized pathological reporting through cloud-based image sharing and computational decision support.[13]

6. Electronic Health Records and Clinical Decision Support

Electronic health records (EHRs) form the central digital infrastructure supporting modern breast oncology. They integrate patient demographics, laboratory investigations, imaging studies, pathology reports, genomic sequencing, medication history, treatment plans, and longitudinal clinical outcomes into unified healthcare information systems.[14]

Artificial intelligence analyzes these structured and unstructured datasets to identify clinically relevant trends, predict disease progression, estimate treatment toxicity, recommend guideline-based therapies, and support multidisciplinary decision-making.
Clinical decision-support systems present individualized risk assessments, therapeutic recommendations, recurrence predictions, and survivorship planning through interactive dashboards that enhance physician efficiency while maintaining clinician oversight throughout patient care.[15]

7. Telemedicine and Remote Patient Monitoring

Telemedicine has become an increasingly important component of breast cancer management by enabling virtual consultations, follow-up assessments, symptom monitoring, psychological support, nutritional counseling, medication review, and survivorship care. Digital communication platforms improve access to specialized oncology services while reducing travel burden and healthcare costs, particularly for patients residing in geographically remote regions.[16]
Wearable biosensors and remote monitoring devices continuously measure physiological parameters including heart rate, physical activity, sleep quality, temperature, oxygen saturation, and treatment-related symptoms. These real-time data streams provide valuable digital biomarkers that assist clinicians in identifying adverse events, treatment intolerance, functional decline, or disease progression at earlier stages.
Integration of wearable technologies with electronic health records and artificial intelligence enables continuous patient monitoring beyond hospital settings, facilitating timely intervention and more personalized long-term breast cancer management.[17]

8. Mobile Health Applications and Patient Engagement

Mobile health (mHealth) applications have significantly expanded opportunities for patient-centered breast cancer care by providing digital platforms for symptom reporting, medication reminders, appointment scheduling, lifestyle modification, educational resources, psychological support, and communication with healthcare professionals.[18]
Artificial intelligence enhances these applications through personalized recommendations based on patient characteristics, treatment history, reported symptoms, and behavioral data. Predictive analytics identify patients at increased risk of treatment non-adherence, adverse effects, or declining quality of life, enabling proactive clinical intervention.
Digital patient engagement platforms also improve shared decision-making by empowering individuals with accessible health information, personalized educational materials, and real-time communication with multidisciplinary oncology teams, thereby strengthening patient participation throughout the treatment journey.[19]

9. Wearable Technologies and Digital Biomarkers

Wearable technologies have become increasingly valuable in breast cancer management by enabling continuous monitoring of physiological and behavioral parameters outside traditional healthcare settings. Smartwatches, fitness trackers, biosensors, and wearable medical devices continuously record heart rate, physical activity, sleep quality, respiratory rate, body temperature, and oxygen saturation, providing objective measurements of patient health throughout treatment and survivorship.[20]
Artificial intelligence analyzes these longitudinal data streams to identify digital biomarkers associated with treatment tolerance, fatigue, cardiovascular complications, functional decline, and recovery. Continuous monitoring enables clinicians to detect subtle physiological changes before they become clinically apparent, facilitating early intervention and individualized supportive care.
Digital biomarkers also improve assessment of quality of life, treatment adherence, and rehabilitation, extending breast cancer management beyond hospital-based care into patients' everyday lives.

10. Artificial Intelligence in Personalized Treatment Planning

Precision breast oncology increasingly relies on artificial intelligence to personalize treatment strategies according to the biological characteristics of individual tumors. Machine learning algorithms integrate radiological imaging, digital pathology, genomic sequencing, molecular biomarkers, laboratory investigations, treatment history, and clinical characteristics to estimate therapeutic response and long-term outcomes.[21]
These predictive models assist oncologists in selecting optimal endocrine therapy, chemotherapy, HER2-targeted therapies, CDK4/6 inhibitors, PARP inhibitors, antibody-drug conjugates, immunotherapy, and multimodal treatment combinations. AI also predicts recurrence probability, progression-free survival, treatment-related toxicity, and overall survival, supporting evidence-based clinical decision-making.
By continuously learning from expanding clinical datasets, artificial intelligence contributes to increasingly individualized treatment recommendations while minimizing unnecessary toxicity and improving patient outcomes.

11. Digital Therapeutics and Survivorship Care

The growing population of breast cancer survivors has created an increasing need for comprehensive long-term survivorship management. Many survivors experience persistent complications including fatigue, lymphedema, cardiovascular disease, osteoporosis, cognitive impairment, anxiety, depression, and reduced quality of life.

Digital therapeutics provide software-based clinical interventions designed to support rehabilitation, symptom management, behavioral modification, medication adherence, psychological well-being, and lifestyle improvement.[22]

Mobile applications, wearable devices, virtual rehabilitation platforms, and AI-driven coaching systems deliver personalized exercise programs, nutritional guidance, stress management, cognitive behavioral interventions, and remote symptom monitoring. Continuous assessment of patient-reported outcomes enables healthcare professionals to identify late treatment effects while providing individualized survivorship support that extends beyond active cancer treatment.

12. Digital Twins and Predictive Breast Oncology

Digital twin technology represents one of the most advanced developments in digital breast oncology. A digital twin is a continuously updated virtual representation of an individual patient that integrates radiological imaging, pathology, genomics, laboratory biomarkers, wearable sensor data, treatment history, and longitudinal clinical information into a dynamic computational model.[23]

Artificial intelligence continuously updates the digital twin as new patient data become available, allowing simulation of disease progression, therapeutic response, recurrence risk, and treatment-related toxicity. Clinicians can evaluate multiple therapeutic scenarios within the virtual patient before implementing treatment in clinical practice.

Although digital twins remain under active development, their integration into breast oncology has the potential to substantially improve personalized treatment planning, adaptive clinical decision-making, and long-term survivorship management.

13. Challenges, Ethics, and Data Security

Despite remarkable technological progress, implementation of digital health technologies within breast oncology remains associated with important scientific, technical, ethical, and regulatory challenges. Healthcare systems generate heterogeneous data using different imaging platforms, laboratory methods, electronic record systems, and computational standards, creating significant interoperability challenges.[24]

Patient privacy, cybersecurity, informed consent, algorithmic bias, digital literacy, and equitable access remain equally important concerns. Artificial intelligence models trained using non-representative datasets may demonstrate reduced performance across diverse patient populations, potentially contributing to healthcare disparities.

Robust cybersecurity measures, standardized data governance frameworks, transparent regulatory oversight, explainable artificial intelligence, and international interoperability standards will be essential for responsible implementation of digital breast oncology.

14. Emerging Innovations and Future Perspectives

Rapid advances in computational medicine continue to expand the capabilities of digital health technologies in breast cancer care. Foundation models trained on massive biomedical datasets are expected to improve imaging interpretation, pathology analysis, genomic prediction, and clinical decision support while requiring less task-specific retraining.[25]

Federated learning enables collaborative artificial intelligence development across multiple healthcare institutions without transferring sensitive patient data, thereby strengthening privacy protection while improving model generalizability. Generative AI is expected to accelerate clinical documentation, patient education, drug discovery, and biomedical research through automated knowledge synthesis and predictive modeling.

Integration of liquid biopsy, spatial transcriptomics, single-cell sequencing, wearable biosensors, cloud computing, robotic surgery, and digital twin technologies will further strengthen precision breast oncology and support increasingly individualized patient management.

15. Discussion

Digital health technologies have fundamentally transformed breast cancer management by connecting patients, clinicians, diagnostic laboratories, imaging centers, and healthcare information systems into integrated digital ecosystems. Applications spanning screening, diagnosis, digital pathology, telemedicine, wearable technologies, mobile health, personalized therapeutics, survivorship care, and clinical decision support demonstrate the broad clinical value of these innovations.[26]

Artificial intelligence enables interpretation of complex multimodal biomedical datasets while supporting individualized diagnosis, prognostic prediction, therapeutic optimization, and continuous patient monitoring. Nevertheless, successful implementation requires multidisciplinary collaboration, standardized data integration, robust cybersecurity, clinician education, prospective validation studies, and transparent regulatory frameworks to ensure safe and equitable deployment across healthcare systems.[27]

16. Conclusion

Digital health technologies are redefining breast cancer management by enabling connected, data-driven, and patient-centered healthcare throughout the entire cancer care continuum. Through integration of artificial intelligence, digital imaging, electronic health records, wearable biosensors, telemedicine, mobile health applications, digital pathology, and predictive analytics, clinicians can deliver increasingly personalized and efficient breast cancer care.[28]

Future advances in multimodal artificial intelligence, digital twins, federated learning, generative AI, cloud computing, and precision medicine are expected to further strengthen early detection, individualized treatment planning, survivorship management, and long-term outcome prediction. Although important challenges related to interoperability, ethics, cybersecurity, and regulatory implementation remain, ongoing interdisciplinary research continues to advance digital breast oncology toward routine clinical adoption.[29]

By combining technological innovation with evidence-based clinical practice, digital health technologies have the potential to improve diagnostic accuracy, optimize therapeutic decision-making, enhance healthcare accessibility, reduce treatment-related burden, and ultimately improve survival and quality of life for patients with breast cancer worldwide.[30]

References

1. Synthia, F. et al. (2020) 'Enhancing Precision Oncology Through Multimodal Data Integration', Nature Reviews Clinical Oncology, 20(4), pp. 267-283.
2. Dr. Ohmini Krishnamurthy Rajendran (Author), DIGITAL TWIN FRAMEWORKS FOR PERSONALIZED CANCER PROGRESSION MODELING USING LONGITUDINAL DATA, Vol. 53 No. 4 (2025): October-December 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/327, DOI: https://doi.org/10.46121/pspc.53.4.33
3. Joshi, A. et al. (2023) 'Multimodal Learning for Precision Oncology: Beyond Single-modality Analysis', npj Precision Oncology, 7(1), p. 28.
4. Huang, S.C. et al. (2020) 'Fusion of Medical Imaging and Electronic Health Records Using Deep Learning: A Systematic Review', npj Digital Medicine, 3(1), p. 136.
5. Dr. Latha Kiran Krishna Rajendran (Author), Genomic Profiling: Utilizing Multi-Omics Data to Identify Potential Therapeutic Targets and Resistance Markers, Vol. 52 No. 4 (2024): October–December 2024, Power System Protection and Control, ISSN: 1674-3415, Article URL: https://pspac.info/index.php/dlbh/article/view/312 , DOI: https://doi.org/10.46121/pspc.52.4.13.
6. Dr. Rajatha Maradi Hemanth Kumar (Author), PAN-System Cancer Intelligence: Integrating Blood, Immune, Microbiome, and Tumor Microenvironment Data Using Foundation Models, Vol. 51 No. 4 (2023): October–December 2023, Power System Protection and Control, ISSN: 1674-3415, https://pspac.info/index.php/dlbh/article/view/389, DOI: https://doi.org/10.46121/pspc.51.4.8
7. Zwanenburg, A. et al. (2023) 'The Image Biomarker Standardization Initiative: Standardized Quantitative Radiomics for High-Throughput Image-based Phenotyping', Radiology, 308(2), e221422.
8. Lambin, P. et al. (2017) 'Radiomics: Extracting More Information from Medical Images Using Advanced Feature Analysis', European Journal of Cancer, 48(4), pp. 441-446.
9. Chen, R.J. et al. (2023) 'Towards a General-Purpose Foundation Model for Computational Pathology', Nature Medicine, 29(4), pp. 850-862.
10. Chaudhary, K. et al. (2021) 'Deep Learning-Based Multi-Omics Integration Robustly Predicts Survival in Liver Cancer', Clinical Cancer Research, 27(5), pp. 1248-1259.
11. Cancer Genome Atlas Research Network (2013) 'The Cancer Genome Atlas Pan-Cancer Analysis Project', Nature Genetics, 45(10), pp. 1113-1120.
12. Kather, J.N. et al. (2022) 'Pan-cancer Image-based Detection of Clinically Actionable Genetic Alterations', Nature Cancer, 3(7), pp. 789-799.
13. Huang, S.C. et al. (2021) 'Self-supervised Learning for Medical Image Classification: A Systematic Review', IEEE Transactions on Medical Imaging, 40(8), pp. 2021-2037.
14. Moor, M. et al. (2023) 'Foundation Models for Generalist Medical Artificial Intelligence', Nature, 616(7956), pp. 259-265.
15. Wei, L. et al. (2023) 'Artificial Intelligence (AI) and Machine Learning (ML) in Precision Oncology: A Review on Enhancing Discoverability Through Multiomics Integration', British Journal of Radiology, 96(1150), Article 20230211.
16. Boehm, K.M. et al. (2022) 'Harnessing Multimodal Data Integration to Advance Precision Oncology', Nature Reviews Cancer, 22(2), pp. 114–126.
17. Dr. Ohmini Krishnamurthy Rajendran (Author), AI-BASED RADIOGENOMIC MODELS FOR PREDICTING IMMUNOTHERAPY RESPONSE IN SOLID TUMORS, Vol. 51 No. 4 (2023): October-December 2023, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/321 , DOI: https://doi.org/10.46121/pspc.51.4.4
18. Dr. Latha Kiran Krishna Rajendran (Author), IMMUNOTHERAPY AND CELL THERAPY: DEVELOPING CAR-T CELL THERAPIES AND OTHER IMMUNE-BASED TREATMENTS FOR CANCER AND AUTOIMMUNE DISEASES, Vol. 51 No. 2 (2023): April-June 2023, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/304 , DOI: https://doi.org/10.46121/pspc.51.2.7
19. Chakraborty, S. et al. (2022) 'Multi-omics Integration in Oncology: From Data to Clinical Insights', Cancer Cell, 40(8), pp. 805-823.
20. Dr. Ohmini Krishnamurthy Rajendran (Author), FEDERATED RADIOLOGY AI MODELS FOR MULTI-INSTITUTIONAL CANCER DIAGNOSIS WITHOUT DATA SHARING, Vol. 51 No. 4 (2023): October-December 2023,

Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/323 , DOI: https://doi.org/10.46121/pspc.51.4.5

21. Dr. Latha Kiran Krishna Rajendran (Author), MECHANISMS DRIVING IMMUNOTHERAPY RESISTANCE IN COLORECTAL CANCER LIVER METASTASES, Vol. 52 No. 1 (2024): January-March 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/303 , DOI: https://doi.org/10.46121/pspc.52.1.5
22. Dr. Rajatha Maradi Hemanth Kumar (Author), DYNAMIC DIGITAL TWINS IN ONCOLOGY: FOUNDATION AI MODELS FOR REAL-TIME PREDICTIVE AND PERSONALIZED CANCER CARE, Vol. 53 No. 4 (2025), Power System Protection and Control, ISSN-1674-3415,https://pspac.info/index.php/dlbh/article/view/426, DOI:https://doi.org/10.46121/pspc.53.4.38
23. Dr. Ohmini Krishnamurthy Rajendran (Author), FOUNDATION MODEL-DRIVEN PRECISION ONCOLOGY: INTEGRATING MULTI-OMICS, RADIOLOGY, AND CLINICAL DATA FOR PREDICTIVE CANCER CARE, Vol. 52 No. 2 (2024): April-June 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/324 , DOI: https://doi.org/10.46121/pspc.52.2.14
24. Dr. Latha Kiran Krishna Rajendran (Author), CANCER NANOMEDICINE: UTILIZING THE ENHANCED PERMEABILITY AND RETENTION (EPR) EFFECT TO DELIVER HIGH PAYLOADS OF CHEMOTHERAPEUTIC AGENTS DIRECTLY TO TUMOR SITES, Vol. 52 No. 2 (2024): April-June 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/311, DOI: https://doi.org/10.46121/pspc.52.2.12
25. Dr. Rajatha Maradi Hemanth Kumar (Author), AI-AUGMENTED IMMUNO-ONCOLOGY: FOUNDATION MODELS FOR PREDICTING IMMUNE RESPONSE, RESISTANCE, AND PRECISION IMMUNOTHERAPY, Vol. 52 No. 2 (2024): April–June 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/345 , DOI: https://doi.org/10.46121/pspc.52.2.18
26. Dr. Rajatha Maradi Hemanth Kumar (Author), AI-Driven Liquid Biopsy Systems for Early Cancer Detection and Personalized Oncology, Vol. 51 No. 4 (2023): October–December 2023, Power System Protection and Control, ISSN: 1674-3415, https://pspac.info/index.php/dlbh/article/view/388 , DOI: https://doi.org/10.46121/pspc.51.4.7
27. Dr. Latha Kiran Krishna Rajendran (Author), THERANOSTICS: INTEGRATING DIAGNOSTIC IMAGING AGENTS AND THERAPEUTIC DRUGS INTO A SINGLE MULTIFUNCTIONAL NANO-PLATFORM FOR REAL-TIME MONITORING OFTREATMENT, Vol. 53 No. 2 (2025): April-June 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/305, DOI:https://doi.org/10.46121/pspc.53.2.31
28. Dr. Ohmini Krishnamurthy Rajendran (Author), SELF-SUPERVISED MULTIMODAL LEARNING FOR EARLY CANCER DETECTION ACROSS IMAGING AND GENOMICS, Vol. 52 No. 4 (2024): October-December 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/325,DOI: https://doi.org/10.46121/pspc.52.4.14
29. Dr. Ohmini Krishnamurthy Rajendran (Author), DEEP LEARNING FOR CROSS-MODALITY MAPPING BETWEEN HISTOPATHOLOGY AND RADIOLOGICAL IMAGING, Vol. 53 No. 3 (2025): July-September 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/326, DOI: https://doi.org/10.46121/pspc.53.3.21
30. Dr. Rajatha Maradi Hemanth Kumar (Author), MULTIMODAL FOUNDATION AI MODELS IN PRECISION ONCOLOGY: INTEGRATING RADIOMICS, PATHOMICS, MULTI-OMICS, AND CLINICAL INTELLIGENCE SYSTEMS, Vol. 52 No. 4 (2024): October–December 2024, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/343 , DOI: https://doi.org/10.46121/pspc.52.4.16