# Extracted Research Paper Information

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| Index | Title | Author | Journal | DOI | Objectives | Study Type | Data Type | Model Architecture | Metrics | Conclusion |
| 1 | CrossViT with ECAP: Enhanced deep learning for jaw lesion classification. | ['Panyarak, Wannakamon', 'Suttapak, Wattanapong', 'Mahasantipiya, Phattaranant', 'Charuakkra, Arnon', 'Boonsong, Nattanit', 'Wantanajittikul, Kittichai', 'Iamaroon, Anak'] | International journal of medical informatics | https://doi.org/10.1016/j.ijmedinf.2024.105666 | To investigate the effectiveness of CrossViTs and Extended Cropping and Padding (ECAP) against ResNets for classifying common radiolucent jaw lesions. | Classification | 208 prevalent radiolucent jaw lesions (49 AMs, 59 DCs, 48 OKCs, and 54 RCs) observed in panoramic radiographs or orthopantomograms (OPGs) with confirmed histological diagnoses. | CrossViT-15, -18, ResNet-50, -101, and -152 | Accuracy, specificity, precision, recall (sensitivity), F1-score, and area under the receiver operating characteristics (AUCs) | ECAP improves deep learning model performance for radiolucent jaw lesion classification, particularly when combined with CrossViT models, showing promise for accurate classification of rare lesions with limited data. |
| 2 | Ontology and Bruxism: Do We Have Enough Information? | ['Manfredini, Daniele', 'Lobbezoo, Frank'] | Journal of oral rehabilitation | https://doi.org/10.1111/joor.13890 | To clarify the classification and definition of bruxism and to improve the understanding of bruxism within the dental community. | N/A | Data gathered using the Standardized Tool for the Assessment of Bruxism (STAB) and the BruxScreen screening instrument. | N/A | N/A | Proposals to adopt ontological principles to classify bruxism are currently speculative and not based on sufficient factual information; the introduction of standardized evaluation systems marks the beginning of a new era in bruxism research. |
| 3 | Comparing the dental knowledge of large language models. | ['Tussie, Camila', 'Starosta, Abraham'] | British dental journal | https://doi.org/10.1038/s41415-024-8015-2 | To compare different large language models (LLMs) on their dental knowledge by testing the accuracy of model responses to Integrated National Board Dental Examination (INBDE) questions. | N/A | INBDE question bank | ChatGPT-4, Claude-2.1, Mistral-Medium (specific architectures not detailed) | Accuracy (ChatGPT-4: 75.88%, Claude-2.1: 66.38%, Mistral-Medium: 54.77%) | The study highlights the high potential of LLM integration into the dental field, emphasizes the importance of model selection for developing new technologies, and points out the limitations that must be addressed before unsupervised clinical integration can be adopted. |
| 4 | Enhancement of early proximal caries annotations in radiographs: introducing the Diagnostic Insights for Radiographic Early-caries with micro-CT (ACTA-DIRECT) dataset. | ['Valenzuela, Ricardo E Gonzalez', 'Mettes, Pascal', 'Loos, Bruno G', 'Marquering, Henk', 'Berkhout, Erwin'] | BMC oral health | https://doi.org/10.1186/s12903-024-05076-x | To create a reference-standard dataset for caries annotations by pairing dental radiographs with micro-CT scans, and to evaluate the impact of micro-CT support on interobserver agreement and diagnostic accuracy in detecting early proximal caries. | N/A | 179 paired micro-CT scans and radiographs of early proximal carious teeth. | N/A | Cohen's Kappa for interobserver agreement, sensitivity, and specificity. | The ACTA-DIRECT dataset provides high-quality images and annotations that enhance the precision and reliability of AI-based early caries diagnostics, demonstrating the benefits of incorporating micro-CT scans in lesion assessments. |
| 5 | Does the FARNet neural network algorithm accurately identify Posteroanterior cephalometric landmarks? | ['Gonca, Merve', 'Bayrakdar, Ibrahim Sevki', 'Celik, Ozer'] | BMC medical imaging | https://doi.org/10.1186/s12880-024-01478-z | To explore whether the feature aggregation and refinement network (FARNet) algorithm accurately identified posteroanterior (PA) cephalometric landmarks. | Object detection | 1,431 PA cephalograms | FARNet | Mean radial error (MRE) and successful detection rates (SDRs) within 2, 2.5, 3, and 4 mm | The FARNet algorithm streamlined orthodontic diagnosis. |
| 6 | Automated detection and labeling of posterior teeth in dental bitewing X-rays using deep learning. | ['Alsolamy, Mashail', 'Nadeem, Farrukh', 'Azhari, Amr Ahmed', 'Alsolami, Wafa', 'Ahmed, Walaa Magdy'] | Computers in biology and medicine | https://doi.org/10.1016/j.compbiomed.2024.109262 | To automate tooth numbering in bitewing radiographs using an AI-powered system. | Object detection | 3000 adult digital bitewing radiographs (BRs) | YOLO (You Only Look Once) architecture | Precision, recall, mean average precision (mAP) | The proposed AI-powered system achieved high precision and recall for tooth detection and numbering, demonstrating significant time savings for dental professionals while maintaining efficiency in clinical workflows. |
| 7 | Deep learning-based algorithm for staging secondary caries in bitewings. | ['van Nistelrooij, Niels', 'Chaves, Eduardo Trota', 'Cenci, Maximiliano Sergio', 'Cao, Lingyun', 'Loomans, Bas A C', 'Xi, Tong', 'El-Ghoul, Khalid', 'Romero, Vitor Henrique Digmayer', 'Lima, Giana Silveira', 'Flugge, Tabea', 'van Ginneken, Bram', 'Huysmans, Marie-Charlotte', 'Vinayahalingam, Shankeeth', 'Mendes, Fausto Medeiros'] | Caries research | https://doi.org/10.1159/000542289 | To develop a Convolutional neural network (CNN)-based algorithm for detecting and staging secondary caries using a novel approach for determining lesion severity. | Object detection | A dataset from a Dutch dental practice-based research network containing 2,612 restored teeth in 413 bitewings from 383 patients aged 15 to 88 years. | Mask R-CNN with a Swin Transformer backbone | Specificity (0.966 for all lesions, 0.964 for dentine lesions), Sensitivity (0.737 for all lesions, 0.808 for dentine lesions), Areas under ROC curves (0.940 for all lesions, 0.946 for dentine lesions), Pearson correlation coefficient (0.802 for severity scores). | An improved algorithm was developed to support clinicians in detecting and staging secondary caries in bitewing, incorporating an innovative approach for annotation, considering the lesion severity as a continuous outcome. |
| 8 | Comparative accuracy of artificial intelligence chatbots in pulpal and periradicular diagnosis: A cross-sectional study. | ['Mendonca de Moura, Joao Daniel', 'Fontana, Carlos Eduardo', 'Reis da Silva Lima, Vitor Henrique', 'de Souza Alves, Iris', 'Andre de Melo Santos, Paulo', 'de Almeida Rodrigues, Patricia'] | Computers in biology and medicine | https://doi.org/10.1016/j.compbiomed.2024.109332 | This study aimed to evaluate the diagnostic accuracy and treatment recommendation performance of four artificial intelligence chatbots in fictional pulpal and periradicular disease cases. Additionally, it investigated response consistency and the influence of text order and language on chatbot performance. | Cross-sectional comparative study | Eleven cases representing various pulpal and periradicular pathologies | N/A | Diagnostic accuracy rates, treatment recommendation accuracy, overall consistency rate | Bing and ChatGPT 4.0 demonstrated superior diagnostic accuracy, while Bard showed the lowest accuracy in both diagnosis and treatment recommendations. However, the clinical application of these tools necessitates critical interpretation by dentists, as chatbot responses are not consistently reliable. |
| 9 | Reliability and accuracy of Artificial intelligence-based software for cephalometric diagnosis. A diagnostic study. | ['Mercier, Jean-Philippe', 'Rossi, Cecilia', 'Sanchez, Ivan Nieto', 'Renovales, Ines Diaz', 'Sahagun, Patricia Martin-Palomino', 'Templier, Laura'] | BMC oral health | https://doi.org/10.1186/s12903-024-05097-6 | To assess the reliability, accuracy, and time consumption of AI-based software compared to a conventional digital cephalometric analysis method on 2D lateral cephalograms. | N/A | 408 lateral cephalometries | N/A | Accuracy of landmark positioning, time required for cephalometric tracing | The study showed a statistical difference in accuracy between the conventional digital technique and two AI-based software alternatives, but these differences were not clinically significant except for specific measurements. The semi-automatic option was more accurate than the automatic one and faster than conventional tracing. Further research is needed to confirm AI's accuracy in cephalometric tracing. |
| 10 | Evaluation of root canal filling length on periapical radiograph using artificial intelligence. | ['Celik, Berrin', 'Genc, Mehmet Zahid', 'Celik, Mahmut Emin'] | Oral radiology | https://doi.org/10.1007/s11282-024-00781-3 | This work proposes a novel method to evaluate root canal filling (RCF) success using artificial intelligence (AI) and image analysis techniques. | Semantic segmentation | 597 periapical radiographs (PARs) of 1121 teeth with root canal treatment | 5 different state-of-the-art deep learning models based on convolutional neural networks (CNNs) | Intersection over union (IoU), Dice score, accuracy | Our study demonstrates that AI-based solutions present accurate and reliable performance for root canal filling evaluation. |
| 11 | Advanced Imaging in Dental Research: From Gene Mapping to AI Global Data. | ['Graves, D T', 'Uribe, S E'] | Journal of dental research | https://doi.org/10.1177/00220345241293040 | To highlight breakthroughs in imaging technologies and AI in dental, oral, and craniofacial research. | N/A | N/A | N/A | N/A | Advances in imaging technologies and AI provide new insights into biological complexity and clinical applications. |
| 12 | [Research on in-vivo electron paramagnetic resonance spectrum classification and radiation dose prediction based on machine learning]. | ['Xiong, Guangwei', 'Chen, Bo', 'Ma, Lei', 'Jia, Longpeng', 'Chen, Shunian', 'Wu, Ke', 'Ning, Jing', 'Zhu, Bin', 'Guo, Junwang'] | Sheng wu yi xue gong cheng xue za zhi = Journal of biomedical engineering = Shengwu yixue gongchengxue zazhi | https://doi.org/10.7507/1001-5515.202302015 | To establish a method for automatic classification and identification of in-vivo EPR spectra for rapid and non-invasive detection of radiation dose after nuclear and radiation emergencies. | Classification | In-vivo EPR spectra | Support Vector Machine (SVM) and Genetic Algorithm Optimization Neural Network (GA-BPNN) | N/A | The SVM and GA-BPNN spectrum processing methods effectively accomplished automatic spectra classification and radiation dose prediction, enhancing the efficiency of mass EPR spectra processing in nuclear emergencies. |
| 13 | Detection of carotid plaques on panoramic radiographs using deep learning. | ['Vinayahalingam, Shankeeth', 'van Nistelrooij, Niels', 'Xi, Tong', 'Heiland, Max', 'Bressem, Keno', 'Rendenbach, Carsten', 'Flugge, Tabea', 'Gaudin, Robert'] | Journal of dentistry | https://doi.org/10.1016/j.jdent.2024.105432 | To detect carotid artery calcification (CAC) on panoramic radiographs (PRs) using an artificial intelligence (AI) model based on a vision transformer. | Object detection | 6,404 panoramic radiographs (PRs) obtained from one hospital | Faster R-CNN and Swin Transformer | Precision, F1-score, recall, area-under-the-curve (AUC), average precision (AP) | The detection performance of the newly developed and validated model was improved compared to previously reported models. |
| 14 | Accuracy and Consistency of Gemini Responses Regarding the Management of Traumatized Permanent Teeth. | ['Portilla, Nicolas Dufey', 'Garcia-Font, Marc', 'Nagendrababu, Venkateshbabu', 'Abbott, Paul V', 'Sanchez, Jose Antonio Gonzalez', 'Abella, Francesc'] | Dental traumatology : official publication of International Association for Dental Traumatology | https://doi.org/10.1111/edt.13004 | The aim of the study was to assess the accuracy and consistency of responses provided by Google Gemini (GG) to questions related to the European Society of Endodontology position statement on the management of traumatized permanent teeth (MTPT). | Cross-sectional observational analytical study | A set of 99 yes/no questions covering all areas of the management of traumatized permanent teeth (MTPT) | N/A | Accuracy evaluated using the Wald binomial method; consistency assessed using the kappa-Fleiss coefficient | The responses generated by Gemini showed an overall moderate accuracy of 80.81% and high consistency of 95.96%, indicating its potential use as a free-access source of information for clinicians in the MTPT. |
| 15 | Oral screening of dental calculus, gingivitis and dental caries through segmentation on intraoral photographic images using deep learning. | ['Liu, Yi', 'Cheng, Yuxi', 'Song, Yang', 'Cai, Daoheng', 'Zhang, Niankun'] | BMC oral health | https://doi.org/10.1186/s12903-024-05072-1 | To investigate and evaluate a deep learning system designed to segment intraoral photographic images for the detection of dental caries, dental calculus, and gingivitis, and to assess the degree of dental calculus based on the overall features of the tooth surface and gingival margin. | Semantic segmentation | 3,365 oral endoscopic images | Oral-Mamba | Accuracy rates for gingivitis (0.83), dental caries (0.83), dental calculus (0.81), and accuracy of degree classification (85%) | The proposed deep learning system is expected to assist in the oral screening of dental caries, dental calculus, and gingivitis, providing benefits such as intuitive use, time efficiency, cost-effectiveness, and ease of deployment. |
| 16 | Automating Dental Condition Detection on Panoramic Radiographs: Challenges, Pitfalls, and Opportunities. | ['Muresanu, Sorana', 'Hedesiu, Mihaela', 'Iacob, Liviu', 'Eftimie, Radu', 'Olariu, Eliza', 'Dinu, Cristian', 'Jacobs, Reinhilde', 'On Behalf Of Team Project Group'] | Diagnostics (Basel, Switzerland) | https://doi.org/10.3390/diagnostics14202336 | To develop and validate an AI model for detecting various dental conditions, with a focus on identifying teeth at risk prior to radiotherapy. | Object detection | 1628 annotated panoramic radiographs for training and 180 radiographs from multiple centers for external validation | YOLOv8 | Precision and recall values exceeding 0.8 for several conditions | YOLOv8 demonstrated robust detection capabilities for several dental conditions, especially in training data, but further refinement is needed to enhance generalizability in external datasets and improve performance for conditions like periapical lesions and bone loss. |
| 17 | AI-Powered Identification of Osteoporosis in Dental Panoramic Radiographs: Addressing Methodological Flaws in Current Research. | ['Gaudin, Robert', 'Vinayahalingam, Shankeeth', 'van Nistelrooij, Niels', 'Ghanad, Iman', 'Otto, Wolfus', 'Kewenig, Stephan', 'Rendenbach, Carsten', 'Alevizakos, Vasilios', 'Grun, Pascal', 'Kofler, Florian', 'Heiland, Max', 'von See, Constantin'] | Diagnostics (Basel, Switzerland) | https://doi.org/10.3390/diagnostics14202298 | To develop a robust AI application for accurate osteoporosis identification in panoramic radiographs (PRs). | Object detection and classification. | 348 panoramic radiographs for development, 58 for validation, and 51 for hold-out testing. | YOLOv8 for object detection and EfficientNet for classification. | Sensitivity of 0.83, F1-score of 0.53, and area under the curve (AUC) of 0.76. | The research presents a proof-of-concept algorithm demonstrating the potential of deep learning to identify osteoporosis in dental radiographs, with a critique of existing algorithms' credibility. |
| 18 | Multi-label dental disorder diagnosis based on MobileNetV2 and swin transformer using bagging ensemble classifier. | ['Alsakar, Yasmin M', 'Elazab, Naira', 'Nader, Nermeen', 'Mohamed, Waleed', 'Ezzat, Mohamed', 'Elmogy, Mohammed'] | Scientific reports | https://doi.org/10.1038/s41598-024-73297-9 | The aim of the study is to propose a new diagnosis system for dental diseases using X-ray imaging to aid in early dental disease diagnosis. | Classification | A benchmark dental radiography dataset | Hybrid model integrating MobileNetV2 and Swin Transformer architectures | Precision (95.7%), Sensitivity (95.4%), Specificity (95.7%), Dice similarity coefficient (95.5%), Accuracy (95.6%) | The proposed hybrid model outperforms state-of-the-art techniques in classifying dental diseases using dental panoramic X-ray imaging, demonstrating effectiveness in robustly and accurately diagnosing dental diseases automatically. |
| 19 | Tooth numbering with polygonal segmentation on periapical radiographs: an artificial intelligence study. | ['Ayyildiz, Halil', 'Orhan, Mukadder', 'Bilgir, Elif', 'Celik, Ozer', 'Bayrakdar, Ibrahim Sevki'] | Clinical oral investigations | https://doi.org/10.1007/s00784-024-05999-3 | The aim of the present study was to validate the hypothesis that Yolov5 can be trained to detect and number teeth in periapical radiographs. | Object detection | 6446 anonymized periapical radiographs without motion-related artifacts | YOLOv5 | Recall (0.9882), Precision (0.9548), F1 score (0.9712), AUC (0.603) | This study showed that YOLOv5 is nearly perfect for numbering teeth on periapical radiography, serving as a guide for dentists for accurate and rapid diagnosis. |
| 20 | Fully automated method for three-dimensional segmentation and fine classification of mixed dentition in cone-beam computed tomography using deep learning. | ['Hu, Yupeng', 'Liu, Chang', 'Liu, Wei', 'Xiong, Yutao', 'Zeng, Wei', 'Chen, Jinlong', 'Li, Xiang', 'Guo, Jixiang', 'Tang, Wei'] | Journal of dentistry | https://doi.org/10.1016/j.jdent.2024.105398 | To establish a high-precision, automated model using deep learning for the fine classification and three-dimensional (3D) segmentation of mixed dentition in cone-beam computed tomography (CBCT) images. | Classification and 3D segmentation. | 336 CBCT scans for training, 120 mixed dentition CBCT scans from three centers, and 143 permanent dentition CBCT scans from a public dataset. | Modified nnU-Net and U-Net networks. | Dice similarity coefficient, Jaccard coefficient, precision, recall, F-1 score, average symmetric surface distance. | The artificial intelligence model has strong clinical applicability, robustness, and generalizability for mixed and permanent dentition, enhancing diagnostic accuracy and efficacy. |
| 21 | Can deep learning identify humans by automatically constructing a database with dental panoramic radiographs? | ['Choi, Hye-Ran', 'Siadari, Thomhert Suprapto', 'Ko, Dong-Yub', 'Kim, Jo-Eun', 'Huh, Kyung-Hoe', 'Yi, Won-Jin', 'Lee, Sam-Sun', 'Heo, Min-Suk'] | PloS one | https://doi.org/10.1371/journal.pone.0312537 | To propose a novel method to identify individuals by recognizing dentition change using deep learning. | Classification | 1,029 paired dental panoramic radiographs (DPRs) from adults aged 20-49 years. | Convolutional Neural Network (CNN) | Success rates based on matched rank and similarity scores. | The study demonstrated outstanding performance of CNN using dental panoramic radiographs in effectively reducing the size of antemortem candidate groups in identifying humans. |
| 22 | Performance of ChatGPT and Dental Students on Concepts of Periodontal Surgery. | ['Li, Chen', 'Zhang, Jinmei', 'Abdul-Masih, John', 'Zhang, Sihan', 'Yang, Jingmei'] | European journal of dental education : official journal of the Association for Dental Education in Europe | https://doi.org/10.1111/eje.13047 | To compare the knowledge and comprehension abilities of ChatGPT-3.5/4 with that of dental students about periodontal surgery. | Comparative study | Questionnaire responses from 134 dental students | ChatGPT-3.5 and ChatGPT-4 | Response time (seconds), accuracy of responses | ChatGPT's accuracy was not yet comparable to that of the students, but it shows promise in assisting students with the curriculum and helping practitioners with clinical letters and reviews of students' textual descriptions. |
| 23 | Dental admissions pilot activity: Applicants' writing exercise without artificial intelligence influence. | ['Garladinne, Lakshmi', 'Powers, Rodney L', 'Price, Shelia S'] | Journal of dental education | https://doi.org/10.1002/jdd.13756 | N/A | N/A | N/A | N/A | N/A | N/A |
| 24 | Clinical and dental predictors of preterm birth using machine learning methods: the MOHEPI study. | ['Park, Jung Soo', 'Lee, Kwang-Sig', 'Heo, Ju Sun', 'Ahn, Ki Hoon'] | Scientific reports | https://doi.org/10.1038/s41598-024-75684-8 | To identify major predictors of preterm birth (PTB) among clinical and dental variables using machine learning methods. | N/A | Prospective cohort data from 60 women who delivered singleton births via cesarean section (30 PTB, 30 full-term birth [FTB]). | Random Forest (RF) for variable importance analysis; Shapley additive explanation (SHAP) values for association analysis. | N/A | Major predictors of PTB include pre-pregnancy body mass index (BMI), modified gingival index (MGI), preeclampsia, decayed missing filled teeth (DMFT) index, and maternal age, highlighting the need for integrated medical and dental care during pregnancy. Future research should validate these predictors in larger populations and explore interventions to mitigate these risk factors. |
| 25 | AI-based Open-Source Software for Cephalometric Analysis and Predicting Full FOV Values from Low FOV Radiographs. | ['Zecca, Piero Antonio', 'Caccia, Margherita', 'Levrini, Luca', 'Carganico, Andrea', 'Reguzzoni, Marcella', 'Donadio, Davide', 'Tosi, Davide', 'Protasoni, Marina'] | Journal of dentistry | https://doi.org/10.1016/j.jdent.2024.105412 | To enhance the diagnostic processes in dentistry by creating open-source software that utilizes AI to improve the extraction of cephalometric values from limited field of view (FOV) images. | Predictive modeling | Reduced field of view (FOV) images and a randomly selected cohort of 25 untreated orthodontic cases. | N/A | Mean squared error | The software was effective in accurately predicting key cephalometric measurements, suggesting it could be a reliable tool for clinical use, potentially leading to more efficient dental diagnostics and a reduction in the need for additional X-rays. |
| 26 | Comparative evaluation of commercially available AI-based cephalometric tracing programs. | ['Baig, Nida', 'Gyasudeen, Kabir Syed', 'Bhattacharjee, Tanmoy', 'Chaudhry, Jahanzeb', 'Prasad, Sabarinath'] | BMC oral health | https://doi.org/10.1186/s12903-024-05032-9 | Compare the accuracy and diagnostic concordance of three commercially available AI-based lateral cephalometric tracing software. | N/A | Sixty-three lateral cephalometric radiographs | N/A | Sensitivity and specificity tests | All three AI-based tracing programs showed inaccuracies compared to human expert measurements and lacked reliability in measuring key cephalometric parameters. Clinicians should exercise caution when relying solely on AI-based analyses for orthodontic treatment planning and assessment. |
| 27 | A Deep-learning System for Diagnosing Ectopic Eruption. | ['Yu, Haojie', 'Cao, Zheng', 'Pang, Gaozhi', 'Wu, Fuli', 'Zhu, Haihua', 'Zhu, Fudong'] | Journal of dentistry | https://doi.org/10.1016/j.jdent.2024.105399 | To construct a diagnostic model for mixed dentition using a multistage deep-learning network to predict potential ectopic eruption in permanent teeth by integrating dentition segmentation into the process of automatic classification of dental development stages. | Multistage deep-learning model for classification and segmentation. | 1576 anonymous panoramic radiographs of children aged 6-12 years. | N/A | Intersection over Union (0.959), precision (0.993), sensitivity (0.966), F1 score (0.979). | The AI-enabled model demonstrated efficacy in diagnosing ectopic eruptions and adaptability across multiple scenarios, providing insights for the prevention and treatment of abnormal tooth eruption. |
| 28 | Feasibility of using two generative AI models for teeth reconstruction. | ['Saleh, O', 'Spies, B C', 'Brandenburg, L S', 'Metzger, M C', 'Luchtenborg, J', 'Blatz, M B', 'Burkhardt, F'] | Journal of dentistry | https://doi.org/10.1016/j.jdent.2024.105410 | This feasibility study investigates the application of artificial intelligence (AI) models, specifically transformer-based (TM) and diffusion-based (DM) models, for the reconstruction of single and multiple missing teeth. | Reconstruction of missing teeth | A dataset of 129 digitized models | Transformer-based (TM) and diffusion-based (DM) models | Root Mean Square (RMS) and mean absolute error (MAE) | AI-based TM and DM models demonstrate promising results in reconstructing missing teeth, with superior accuracy in single-tooth compared to multiple-tooth edentulous spaces, and have the potential to streamline and improve dental restoration processes. |
| 29 | Publicly Available Dental Image Datasets for Artificial Intelligence. | ['Uribe, S E', 'Issa, J', 'Sohrabniya, F', 'Denny, A', 'Kim, N N', 'Dayo, A F', 'Chaurasia, A', 'Sofi-Mahmudi, A', 'Buttner, M', 'Schwendicke, F'] | Journal of dental research | https://doi.org/10.1177/00220345241272052 | To provide a comprehensive overview of all publicly available dental imaging datasets to address the gap in data availability and support AI development in dentistry. | Observational study. | 16 unique dental imaging datasets containing images (intraoral photos, scans, radiographs, etc.) with a focus on tooth segmentation and labeling. | N/A | FAIRness metrics and metadata completeness. | There is a scarcity of publicly available imaging dental data and inconsistent metadata reporting, highlighting the need for efforts to address data scarcity, increase diversity, mandate metadata completeness, and ensure FAIRness in AI dental imaging research. |
| 30 | Evaluation of validity and reliability of AI Chatbots as public sources of information on dental trauma. | ['Johnson, Ashish J', 'Singh, Tarun Kumar', 'Gupta, Aakash', 'Sankar, Hariram', 'Gill, Ikroop', 'Shalini, Madhav', 'Mohan, Neeraj'] | Dental traumatology : official publication of International Association for Dental Traumatology | https://doi.org/10.1111/edt.13000 | This study aimed to assess the validity and reliability of AI chatbots in addressing frequently asked questions (FAQs) related to dental trauma. | N/A | A set of 30 FAQs was formulated, refined to 20 questions, and responses were generated from four AI chatbots. | N/A | Global Quality Score (GQS) on a 5-point Likert scale; validity determined by low and high thresholds of scores. | The Claude AI chatbot demonstrated superior validity and reliability compared to ChatGPT and Google Gemini, whereas Bing was found to be less reliable. |
| 31 | Comparative Analysis of the Response Accuracies of Large Language Models in the Korean National Dental Hygienist Examination Across Korean and English Questions. | ['Song, Eun Sun', 'Lee, Seung-Pyo'] | International journal of dental hygiene | https://doi.org/10.1111/idh.12848 | To evaluate and compare the performance of Gemini, GPT-3.5, and GPT-4 in the Korean National Dental Hygienist Examination. | N/A | Questions from the Korean National Dental Hygienist Examination over 5 years (2019-2023). | Gemini, GPT-3.5, GPT-4. | Accuracy of answering examination questions. | GPT-4 holds significant promise for application in medical education and standardized testing, especially in English, but variability in performance across different subjects and languages indicates the need for ongoing improvements and more diverse training datasets. |
| 32 | Artificial intelligence knowledge, attitudes and application perspectives of undergraduate and specialty students of faculty of dentistry in Turkey: an online survey research. | ['Yilmaz, Cemile', 'Erdem, Rahime Zeynep', 'Uygun, Latife Altinok'] | BMC medical education | https://doi.org/10.1186/s12909-024-06106-6 | To investigate the knowledge, attitudes, and perceptions of fourth- and fifth-year undergraduate as well as specialty dentistry students in Turkey concerning artificial intelligence (AI) and its applications. | N/A | Survey data from 335 undergraduate students and 62 specialty students from dental faculties in Turkey. | N/A | Cronbach's alpha for internal consistency; statistical analysis using Pearson's Chi-square test and Fisher-Freeman-Halton tests. | The findings emphasize the importance of cautiously managing AI's role in healthcare services, prioritizing patient privacy and data security, and recognizing AI as a complement to dental professionals' work rather than a substitute. Further research is recommended for a comprehensive understanding of attitudes toward AI in dentistry. |
| 33 | ChatGPT May Help Inform Patients in Dental Implantology. | ['Coban, Elif', 'Altay, Berkan'] | The International journal of oral & maxillofacial implants | https://doi.org/10.11607/jomi.10777 | To evaluate the quality of responses provided by ChatGPT to patient questions in the field of dental implantology. | Cross-sectional study. | 60 questions related to dental implantology (30 questions about general information and 30 questions about dental implant brands). | N/A | Global Quality Scale (GQS, scored from 1 [low quality] to 5 [high quality]). | The AI platform may contribute to the additional education of patients in dental implantology, but it may exhibit bias regarding dental implant brands, which could impact patient guidance. |
| 34 | Anomaly detection of retention loss in fixed partial dentures using resonance frequency analysis and machine learning: An in vitro study. | ['Sammour, Sara Reda', 'Naito, Hideki', 'Kimoto, Tomoyuki', 'Sasaki, Keiichi', 'Ogawa, Toru'] | Journal of prosthodontic research | https://doi.org/10.2186/jpr.JPR\_D\_23\_00154 | To determine the usefulness of machine learning techniques for assessing the cementation condition between a fixed partial denture (FPD) and its abutment using a resonance frequency analysis (RFA) system. | Supervised and unsupervised learning. | In vitro mandibular model with a single crown and three-unit bridge made of a high-gold alloy, tested under various cementation conditions. | N/A | Feature importance scores and anomaly scores. | Machine learning combined with RFA exhibits good potential to assess the cementation condition of an FPD and facilitate the early diagnosis of FPD retention loss. |
| 35 | Interproximal tooth cleaning operated by a tactile robot. An in vitro analysis. | ['Pieper, Loraine', 'Stiesch, Meike', 'Eich, Lukas', 'Haddadin, Sami', 'Grischke, Jasmin'] | International journal of computerized dentistry | https://doi.org/10.3290/j.ijcd.b4224851 | The aim of the study is to determine if a collaborative tactile robot programmed by a dental student can remove interproximal artificial plaque as effectively as a human operator. | In vitro pilot study | Model teeth covered with artificial plaque | N/A | Residual plaque measured with binary pictures; significance defined at alpha = 0.05 | A tactile robot with integrated AI programmed by a dental student can perform interproximal cleaning as effectively as a dental student. |
| 36 | Deep learning for diagnostic charting on pediatric panoramic radiographs. | ['Kaya, Emine', 'Gunec, Huseyin Gurkan', 'Urkmez, Elif Seyda', 'Aydin, Kader Cesur', 'Fehmi, Hasan'] | International journal of computerized dentistry | https://doi.org/10.3290/j.ijcd.b4200863 | To evaluate the performance of a deep learning (DL) program for the detection and classification of dental structures and treatments on panoramic radiographs of pediatric patients. | Object detection | 4821 anonymized digital panoramic radiographs of children between 5 and 13 years of age | YOLOv4 (a CNN-based object detection model) | F1 scores of 0.95 for primary teeth, 0.90 for permanent tooth germs, and 0.76 for brackets | The detection of certain dental structures and previous dental treatments on pediatric panoramic radiographs using a DL-based approach may provide early diagnosis of some dental anomalies and help dental practitioners to find more accurate treatment options by saving time and effort. |