



Our AI Research Initiatives

UF College of Dentistry

Improve Patient Outcomes

We will enhance our work using AI/ML approaches to improve patient outcomes and prognosis in patients with pre-malignant and malignant lesions in the oral cavity and jaws, and to use known risk factors and correlating appearance of intraoral lesions with genomic markers and histopathology.

Strengthen Interprofessional Care Teams

Dentistry is part of an ongoing interdisciplinary program with the UF colleges of engineering, nursing, and public health and health professions using virtual patient simulation to strengthen interprofessional teams to solve health care disparities issues, particularly in emergency rooms where communications issues between different healthcare providers can affect patient care.

Teaching students and residents how to address health care needs while engendering cultural sensitivity and empathy will create and strengthen interprofessional teams needed to address patient's clinical needs comprehensively – from didactic to clinical settings. The ultimate goal is to ensure that medical and substance abuse concerns, and broader determinants of health such as education, pharmacological medical, nutrition and oral health, are addressed.

Understand & Treat Chronic Pain

Pain is uniquely manifested in individuals and influenced by multiple biological and psychosocial factors. AI investigations can decode bio/psychosocial interactions, resulting in methods for optimal pain treatment and personalized pain care. College of Dentistry researchers are using multivariate machine learning methods, including support and relevance vector, and Gaussian processes regression to understand the neurobiological contributors of pain in older adults.

These methods cope with high-dimensional types of data (multimodal brain images, psychosocial processes, epi/genetic factors). We also use deep neural networks as a diagnostic biomarker of accelerated brain aging in chronic pain and as a predictor of pain-related functional decline. Further research using these approaches will allow for predictive discrimination of people whose pain may place them at higher risk of developing cognitive decline and Alzheimer's Disease.

Identify Patterns of Gene Expression

The college is researching the use of AI neural networks to identify patterns of gene expression associated with the development of oral diseases, such as periodontal diseases and head and neck cancers, and integrate them with other 'omics' data.

Learn more about [AI at UF](#) or about [AI at UFCD](#).