Orthodontic Faculty Development Fellowship Award

Dr. Mohammed H. Elnagar, DDS, MS, PhD, *University of Illinois, Chicago*

Albert P. Westfall Memorial Award

Biography

Dr. Mohammed H. Elnagar is an Assistant Professor in the Department of Orthodontics, the University of Illinois Chicago (UIC). He received his DDS graduating with honors as class Valedictorian, followed by General Practice Residency, Certificate of Specialty in Orthodontics, and Master of Dental Science. He completed his integrated post-graduate clinical education in orthodontics specialty and Ph.D. training in Dentofacial Orthopedic by skeletal anchorage at UIC. He is currently supervising the post-graduate Orthodontic clinic and taking care of patients at faculty specialty practice at UIC; his practice involved in Digital Orthodontics, Dentofacial Orthopedics interdisciplinary, and surgical orthodontics. Moreover, He is the Director of the AI and 3D Imaging Laboratory at UIC-COD orthodontics; his Research Interests are 3D Imaging, Skeletal Anchorage, Artificial intelligence & Machine learning applications in Health Care, Clinical and Transitional research.

Dr. Elnagar published many articles and presented his work in many national/international meetings. He is the Secretary of the American Association of Dental Research, Chicago section. He received the Robert M. Ricketts Sunflower Award for his research in remote dental monitoring and Artificial intelligence. The AAO also appointed him to be the recipient of the AAO Academy of Academic Leadership Sponsorship Program (AALSP) Award for 2019.

Project Synopsis

There is a considerable amount of scope to include AI in orthodontic diagnosis, treatment planning, and providing personalized orthodontic care. Orthodontics has a unique situation. It depends on the patient's response to the forces generated from the orthodontic appliances. The question is; can we tailor the treatment based on each patient's response? For this purpose, we will need to track the tooth movement and monitor the response to orthodontic forces. The advances in telecommunication make patient-doctor communication easier. There are different apps for exchanging messages and photos between patients and doctors. Many doctors offer a virtual consultation via video conferencing with their patients. Orthodontists also adopt these

solutions, especially during the current COVID-19 pandemic; however, telemedicine has many limitations in orthodontics.

Moreover, this approach has never been evaluated in scientific-based experiment approaches. My research proposes to use the advances in telecommunication and AI to track tooth movent and customize the orthodontic treatment by using remote dental monitoring—an innovative approach which has few evidence-based supports for the accuracy/efficiency of the claims. This project will provide an answer if we can track and monitor the tooth movement remotely. Can this technology provide accuracy and if we can increase the efficacy of orthodontic treatment.

Funding from AAOF was crucial for my research project and the award will help me to recruit patients to participate in my study along with obtaining the needed equipment and software for my project. Furthermore, it will assist in the development of my career as an Educator, Clinician, and Scientist.