2024 Research Aid Award
Dr. Ken Stephen, University of Pittsburgh

1)   A Short Biography

I was born in Cleveland, Ohio and attended both undergraduate and dental school at Ohio State University. Following dental school, I now attend the University of Pittsburgh and am currently a second-year resident in the Department of Orthodontics and Dentofacial Orthopedics. I am an avid sports fan and spend my free time being outdoors with my wife and dog and cooking new recipes. My area of research interest focuses on digital dentistry and optimizing systems that can immediately be applied to the practice setting.

2) A Brief Description of the Project

Three-dimensional (3D) printing technologies are now widely used in orthodontic practices for production of physical study models from digital scans, as well as fabrication of thermoplastic retainers. Although plastic retainers have been widely embraced by the orthodontic community, it has been demonstrated that their fit made on 3D models can be different than those made on stone casts. A recent study has demonstrated that 3D printed casts are subject to inaccuracies depending on printing technology; thus, the process for printing 3D models and using them to fabricate thermoplastic retainers has yet to be optimized to ensure that the appliances produced are clinically acceptable. Managing time and accuracy efficiently is crucial to ensure a productive digital workflow in orthodontics; therefore, the success of 3D printed casts needs to satisfy three criteria: 1) it needs to be accurate, 2) it needs to be produced in a timely manner, and 3) it needs to be financially reasonable to implement into an orthodontic practice. My project focuses on high layer thickness models that can be produced quickly and ensuring their accuracy when used to produce a thermoplastic retainer.

3) A Statement of How Orthodontic Education will Benefit from Your Award

The AAOF Research Aid award will provide the means to investigate this topic and ensure that orthodontists are able to optimize 3D printer settings that allow them to produce dental models quickly, accurately, and cost effectively.

4) Why the Foundation is Important to Your Project

The Foundation's support has allowed my project to acquire the materials that are needed to produce the number of dental models necessary to obtain statistical significance following our pilot study. I am very grateful that AAOF's support has made my project possible and that I will have an opportunity to impact my profession.

5) How the Foundation Funding is Expected to or has Benefited Your Career

The Foundation's support will benefit my career for years to come. Firstly, it has shown me how to not only put together a comprehensive study, but in doing so I feel more able to access research projects. My goal has always been to one day contribute to educating residents, and the support of the Foundation has shown me that contributing to the profession through both research and instruction are things that I value.