

Design Optimization of Emergency-Use Ventilator to Improve Assembly
Time
(Technical Report)

Approaches to Improving Healthcare Accessibility in Rural United States
(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
School of Engineering and Applied Science
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Biomedical Engineering

by

Christian Anton

date submitted, in May 11, 2023

Preface

How have public health authorities sought to optimize responses to the coronavirus pandemic? Demands on emergency responders and other medical personnel have risen since the pandemic, especially in underserved rural areas.

Ventilators are costly and can be difficult to use without training. To simplify cable management and improve ease of use, the research team designed and prototyped a 3D-printed manifold and tubing sleeve for Ventis Medical's emergency-use ventilator. The prototype was developed in 3D modeling software and modified iteratively in response to test results. This resulted in assembly time reduction by an average of 3.4 seconds respectively.

In the United States, following the coronavirus pandemic, healthcare providers, public agencies, companies, and local advocacies have sought to improve healthcare access in rural communities by ensuring specialized infrastructure is catered towards these areas.