A novel way to manage and control chronic respiratory diseases

Nick Delmonico, MBA
Founder and CEO of Strados Labs

Valentin Fauveau, MSc
Data Scientist and Biomedical Engineer

Abstract:

An estimated 450 million people worldwide suffer from chronic respiratory diseases such as asthma or chronic obstructive pulmonary disease (COPD). The clinical standard of care in the diagnosis and treatment of respiratory disorders is stethoscope-based lung auscultation. Clinical signs are an integral part of the diagnosis and management of these diseases. Such use of a stethoscope, however, is limited by the episodic nature of data acquisition, as well as by the limits of human subjectivity in the recognition of symptoms. Some indications of a respiratory complication may include shortness of breath, coughing, wheezing, and labored breathing. Unfortunately, there is currently no way to objectively monitor these signs. At Strados Labs we have developed the world's first AI-powered acoustic bio-sensor designed to bring wireless, hands-free, respiratory monitoring to clinical teams over the entire episode of care. This non-invasive clinical-grade medical device also uses proprietary machine learning algorithms to identify key changes in pulmonary sounds and breathing patterns, and to notify care teams about the respiratory health status of patients. In this way, we seek to improve care triage, reduce length of hospital stay, and avoid costly pulmonary complications. The non-invasive device captures lung sounds and chest wall motion from which it extracts key features in the time and frequency domains to identify vital respiratory symptoms. Proprietary machine learning techniques, derived from state-of-the-art speech recognition algorithms, then use the characterized data to train models that automatically label areas of interest. This process creates a closed loop system that allows the Strados device to operate autonomously and ultimately improve the management and control of chronic respiratory diseases.

Biography:

Nick Delmonico is the founder & CEO of Strados Labs, a medical technology company focused on creating novel ways to manage and monitor respiratory health. Prior to founding Strados Labs, he worked in various financial and consulting roles including PwC and J.P Morgan Chase & Co. During his MBA in Fox School of Business at Temple University, he worked at ECG (now part of Siemens Healthineers), a where he served the general health strategy sector. He holds a Certified Public Accounting license in New York State, and is an active board member of the American Lung Association in Philadelphia, PA. He was named to the Millennials to Watch in Life Sciences list 2018 by Philadelphia Business Journal, a Be Your Own Boss Bowl prize winner in both 2016 (2nd place) and 2017 (1st and Grand Prize) as well as a WeWork Creator Award Finalist.

Valentin Fauveau is a Data Scientist and Biomedical Engineer, currently working at Strados Labs as Lead Data Scientist. He holds an undergraduate diploma in Biomedical Engineering from the Universidad de los Andes (Bogota, Colombia) and two master's degrees, one from Télécom Paristech (Paris, France) in Medical Imaging and Artificial Intelligence, and the second in Computational Bioengineering from Columbia University (New York, US). He has a vast experience in Image and Signal Processing, as well as developing AI models for this type of data. He worked at the Forensic and Criminal Intelligence Agency of the French Gendarmerie where he developed imaging tools for the post-processing and analysis of CT images on Crime Solving. He also led a Deep Learning project in the Novartis Institutes for BioMedical

Research to determine the Best-Corrected Visual Acuity from OCT and IR images. His current work at Strados consist in developing predictive models to detect symptoms and breathing patterns to identify in real time the lung health of patients with respiratory diseases.