DESTINATION STARTUP®

Strivision

One-Sentence Summary of What You Do: Strivision is developing new forms of condition-oriented pulmonary diagnostic tools aimed at the early diagnosis of chronic respiratory conditions through infrared CO2 imaging and AI driven image analysis. Its new form of visual data analytics provides the first viable method of identifying, tracking, and augmenting treatments for pulmonary conditions to improve patient quality of care and clinical outcomes.

Affiliated Institution: University of Colorado Denver

Have you formed a company yet? Yes

Funding/Financing: Grant Funding

Please describe your company and the problem you are trying to solve: Strivision is a new medical imaging and data analytics startup for pulmonary health developed as a University of Colorado spin-off, based in Denver, Colorado. From the development of the core imaging and visual analytics methods used in non-contact respiratory analysis, the company is currently developing medical imaging device prototypes and completing initial clinical trials and investigating broad patient markets.

The early detection of breathing disorders is vital to mitigating serious consequences resulting from numerous pulmonary diseases that impair breathing function, decrease cognitive function, increase cardiovascular risk, and generate irreversible lung damage. The problem we are addressing is how to identify the early signatures of predominant pulmonary conditions (COPD, ARDS, ENT conditions) to enable new forms of preventative medicine through natural, long-term breathing analysis. Our aim is to not only identify known behavioral traits of existing conditions, but significantly increase our knowledge of unseen or complex flow behaviors critical for the early detection of conditions that contribute to irreversible lung damage. In the existing process, slight abnormalities have to be identified through physician insight and experience based on very limited information such as breathing rate (RR), flow, and Tidal Volume (TV), and various pulmonary function tests all of which are only measured as brief snap-shots of a patient's respiratory health. For physicians, this means that they are inherently bound to identifying and diagnosing conditions based on these limited measurements, severely limiting how these conditions can be identified during the early stages of development.

To solve this, we introduce the first optical breathing diagnostic system that enables pulmonologists to see, measure, and accurately understand detailed condition-induced behaviors based on thermal CO2 exhale flow visualization. From a non-contact solution, our technology has capabilities in visual data analytics for the early detection of minute condition signatures within continuous and natural

breathing through machine learning (AI). This enables our solution to provide new forms of data for diagnostics and the ability to discover new traits of pulmonary conditions, providing a much higher potential than the capabilities of existing solutions.

We aim to provide our solution in pediatrics for Sleep Disordered Breathing (SDB), but also plan to extend our solutions to address broader pulmonological conditions including asthma, Chronic Obstructed Pulmonary Disease (COPD), and Ear-Nose and Throat (ENT) related conditions. Our current solution has been lab-tested and we are in the translational process of deploying the technology in Children's Hospital Colorado for our initial SDB studies. To protect our technology, we have filed multiple patent applications and are in the process of securing the IP associated with the imaging and data analytics that differentiates our core product from existing technologies.

What is/was your go-to-market strategy? Currently, there are 20-25 million people in the United States living with unaddressed respiratory conditions and the pulmonary diagnostics market is poised to reach over $35 billion in 2025. This market evaluation is based on an increase in awareness of the severity and consequences of long- term respiratory ailments. This introduces a tremendous opportunity for our technology to make a significant impact on respiratory analysis to extend the treatable patient segment to include a large portion of currently under-addressed and pediatric populations. Existing devices that measure pulmonary function are limited because: (1) they require patients to breathe through tubes which alters natural breathing and is uncomfortable, especially for any monitoring over a few minutes, or (2) they use indirect measurement chest belts that correlate chest movement to airflow, which provides limited diagnostic information. Our solution is differentiated by the fact that we do not touch the patient and we can directly identify exhale breathing behaviors through thermal CO2 imaging. This allows us to provide many of the metrics provided by existing devices while introducing new imaging metrics that include: nose-mouth distribution, long- term exhale strength, and natural breathing through passive monitoring to identify pulmonary conditions as the earliest possible stage. The initial access to these markets is tied to deployment, FDA approval through the 510K process, and early adoption through partnership with Children's Hospital Colorado and our clinical evangelists. To expand our initial market and to address the growing trend of at-home care, we are developing portable solutions that aim to create a new data- analytics market for continuous respiratory monitoring.

How will/do you generate revenue? The solution we provide is an integrated system of hardware and software that can be used to enable new forms of respiratory analysis. Through the deployment of our device and the diagnostic capabilities it enables, our revenue model is based on the continuous use and integration of the system within existing respiratory diagnostic clinics. Our primary revenue model is initially based on the direct hardware sales that cover software updates and continued support, followed by continuous data analytics service that enables the ability to improve diagnosis accuracy and improve patient outcomes by providing a large- scale database and analysis tools for common respiratory conditions. As part of the NSF I-Corps program, we oriented our research towards reimbursement, device acquisition and adoption policies, and investigated the

viability of applying new technologies to the established set of respiratory diagnostic studies. Based on this, we have identified a core set of value propositions that can be leveraged to promote the adoption of our solution, particularly for under- addressed patient populations. This enables our solution to not only improve the healthcare outcomes that most clinics are evaluated by, but also presents new diagnostic procedures unobtainable by existing devices that can adapt to the revenue models of our customers. Primarily, this allows us to adopt new clinical methods for children and infants due to limited contact and creates an opportunity to introduce mobile solutions that can be used for at- home care. This expands the vertical structure of our revenue model by broadening the addressable patient population.

Who are the members of your team and why is this the right team to get the job done?

Our team is composed of Shane Transue CEO and Postdoctoral Researcher in medical imaging and physical simulation at CU Denver, Min-Hyung Choi CTO and Professor in the Department of Computer Science at CU Denver, and James Chung, VP of Engineering and technology commercialization expert with over 20 years of product development experience.

Dr. Choi and Dr. Transue have worked together for over eight years and developed a cooperative relationship with funding agencies and clinical partners that includes a strong interdisciplinary connection between core technology research and clinical deployment of vision-based technologies. This includes an established working relationship with Children's Hospital Colorado where we are currently investigating the in-field capabilities of our technology for sleep-related respiratory conditions. Through our initial customer discovery process in the NSF I-Corps program, we also established new connections with Amy Schell, MD, an Otolaryngologist from the ENT Institute at Case Western Reserve University and John Carter, MD, a pulmonologist, sleep, and critical care specialist at MetroHealth Cleveland.

As part of our clinical and business mentors we are working with Ann Halbower MD, in Pediatric Pulmonology at the University of Colorado School of Medicine, and Charles Weinberger MBA, a former executive of Champion Optical Network Engineering, LLC currently active as an EIR with Boulder Venture Partners.

The close integration between our technical research, the clinical evaluation of the proposed technology, and the business mentorship we have received through our established team and partners will enable a rapid translation of our technology to clinical settings.