

# AIRVIZ

ENVIRONMENTAL SENSORS +

IOT CAPABILITY +

DATA ANALYSIS & VISUALIZATION



# Air Quality Impact and Market

IAQ-related economic impact estimated at up to **\$158 B** annually.

Air quality sensing market \$240M today, with 14.3% CAGR above **\$500 M** by 2024.

- Exponentially rising awareness around health impact of urban smog, industrial emissions, wild fires.
- Increasing scrutiny of pollution sources by NGOs and government agencies.
- Global, growing need for **affordable** sensor networks in homes, office spaces, urban and rural communities to capture actionable air quality data and predictions.



# Relevant Markets

## 1 Residential

Smart Home Market, Wearable  
Devices

## 2 Commercial Buildings

Green Infrastructure, Employee  
Health & Productivity

## 3 Industrial

Manufacturing, Mining,  
Transportation

## 4 Healthcare

Clean Rooms, Virus & Bacteria  
Control



# What We Do

Provide innovative distributed, environmental sensing capabilities, integrated into business-ready decision systems, using low-cost sensors and AI & Big Data



## Environmental Sensors

Air quality: PM2.5, VOCs, CO2, & proprietary ultrafine particle detection down to 100nm for virus and bacteria detection



## Analytics

Enable your organization to make more informed business decisions about worker health and safety, production line yield, and building health.



## Data Visualization

Interactively view air pollution patterns to catch where, how, & when problems occur.



## Smart Calibration & Software

Smart calibration techniques to turn cheap sensors into high performing ones.



# R&D and Rapid Prototyping for Clients

We license IP / white label manufacture devices and systems for Fortune 500 manufacturers and retailers, and commercial service providers.

## ELECTRONICS

Innovative analog and digital design and fabrication for customized sensing and communication.

## MECHANICAL DESIGN

Quick-turnaround iteration of mechanical components through use of CAD/CAM and in-house 3D printing.

## SOFTWARE AND SYSTEMS

Expert firm ware, cloud infrastructure, algorithm, and mobile development for scalable prototyping and testing.

## Testimonials

“ Airviz, with their cutting edge hardware and software teams, has been an incredibly powerful partner for us as they have helped 3M to continue to deliver innovative, and first-of-a-kind product solutions in the marketplace.

~3M Filtrete

”



## Testimonials

“ When it comes to safety in construction and demolition work, we have found that many workers do not take seriously the threat of poor air quality. We started implementing Airviz monitors at job sites and found that the visualization helped workers understand the risk and take steps to ensure their safety. By demonstrating the air quality with simple colors on a rating scale, our team was easily able to see when air quality was poor and were more likely to wear Personal Protective Equipment.

~DECO Resources

”



## Testimonials: 3M Filtrete™ Smart Filter

“ Airviz is great when it comes to team work and group problem solving. We have some truly smart projects on store shelves as a result of our team work!

~Infosys



Airviz was a fantastic hardware development partner for our mutual client. They were great in finding innovative ways to help create a breakthrough product for the client. Airviz loves what they do, and it comes through in their work.

~ArcTouch

”







# Our People: Airviz Expertise



**Illah Nourbakhsh**  
President & CEO

Ph.D. in Computer Science, Founder of 3 companies (Blue Pumpkin acquired by Witness Systems for \$75M), Holds over 15 patents



**Sara Longo**  
Managing Director

Carnegie Mellon Tepper Executive Education Certificate, B.S. in Biology



**Dömötör Gulyás**  
Technology Director

B.S. in Electrical Engineering, Fluent in 3 languages, past Ford Research experience



**Chris Bartley**  
Principal Programmer

M.S. in Robotics from Carnegie Mellon, Co-Inventor of ESDR



**Dave Litton**  
Senior Scientist

M.S. in Physics, Univ of Tennessee Space Institute, Former NIOSH Division Manager & Research Physicist



**Aranya Venkatesh**  
Algorithm Engineer

Ph.D. in Civil & Environmental Engineering from Carnegie Mellon



**Jill Andersen**  
Aerosol Researcher

B.S. in Chemistry from University of Pittsburgh



# History & Milestones

## Phase 1: 2015-2018

- Seed funding as consumer product startup. Succeeded through GTM as one of the first IAQ products at an inexpensive price point
- Negotiated a deal for a new product that added over 240 million of hours of residential data - Airviz maintains this algorithm
- Successfully broadened capability of product line through Fortune 500 distribution partners
- Landed JDA deal for IAQ ultrafine particulate matter monitoring

## Phase 2: 2019

- Leverage IP and design skills to be a technology provider to market share leaders that benefit from AQ visualization
- Commercialize ultrafine particle detector
- AQ pilots with City of Pittsburgh
- Undergoing RESET certification for commercial IAQ building standards



# AIRVIZ TECHNOLOGY & IP



# Inexpensive Sensors

Inexpensive,  
off the shelf  
sensors +  
Airviz smarts



## Speck Sensor

Thousands of residential  
PM monitors sold



## VOC/CO2 Monitor

Innovative calibration to  
lessen fouling over time



## 3M Filtrete™ Smart

HVAC Filter Life Sensor &  
Estimation Algorithm



# Automated Air Quality Networks

Automated air quality sensor networks that give smart, actionable information

Eliminates the need to walk around and spot check air pollution with expensive instruments.

## AQ & Ultrafine PM Detector

Proprietary, low-cost 0.1-0.3  $\mu\text{m}$

## Pollution Mapping

Revealing exactly when and where problems occur

## Algorithms/ML

billions of hours of AQ data to predict patterns and pollution sources



# Ultrafine Particle Detection: Innovative & Inexpensive Sensing Technology

## Product Specifications

**Detection method:** Proprietary optical particulate sensor

**Sensitivity:** Better than  $10 \mu\text{g} / \text{m}^3$  for particles in the range  $100 \text{ nm}$  to  $2.5 \mu\text{m}$ , up to  $1500 \mu\text{g} / \text{m}^3$

**Price:** A few hundred dollars, compared to several thousand

Airviz: \$500

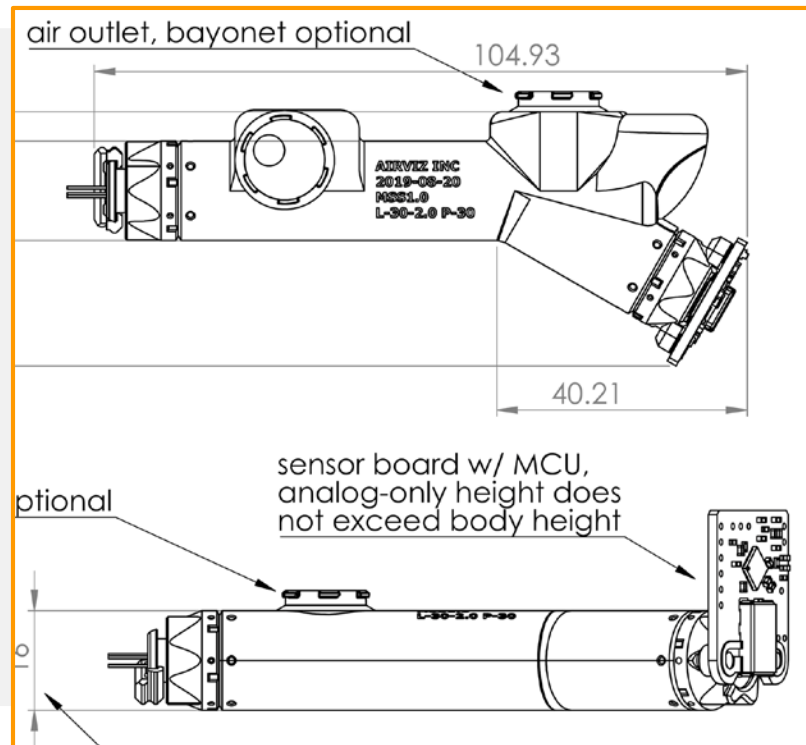
NanoTracer XP (Oxility): \$7,000

TSI P-Trak: \$5,995

TSI 3031: \$8,000

DiSC Mini (testo): \$10,000

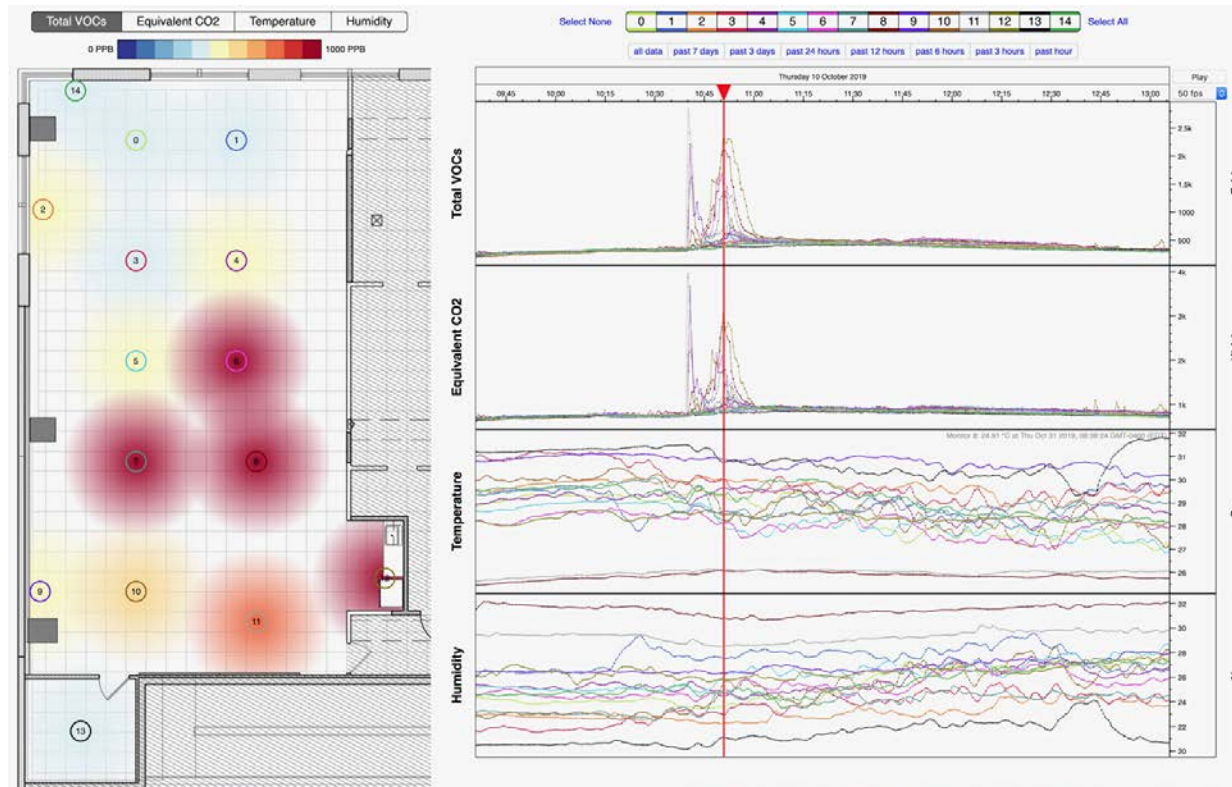
Partector: \$17,000



# Analytics & Pollution Mapping

## 24/7 Pollution Monitoring

Simplifying the monitoring process to show **what** the problem is, **where** it is, and **how** it happened.







# Patent Portfolio

- Patent, Air Quality Sensor
- Patent, Dense Data Acquisition, Storage and Retrieval
- Patent, Low Energy Ultrafine Particle Detector
- Patent, Optical Sensor Head
- Patent Pending, Home Air Quality Analysis & Reporting: Claims allowed. Covers sensor fusion to have many sensors create a complete picture of air quality in a place.
- Patent Pending, Data Fusion for Personal Air Pollution Exposure
- Patent Pending, Group Calibration of Environmental Sensors
- Patent Pending, Proactive Building Air Quality Management





# What's Next

## 12 Months

- Launch of world's most affordable IAQ consumer monitor (\$30) with Fortune 500 company. Expected sales over 100,000 units in first year.
- Joint development of industrial product with Fortune 250 global leader.
- Commercial building demos.
- Integrated temporal and spatial AQ visualization of ultrafine particles and VOC's, showcasing how air pollution travels.
- Pollution source identification with outdoor AQ monitors across cities.
- Research and publications demonstrating impact of air pollution on workforce productivity and health/wellness.



# Funding



## Ask

Looking to raise \$4M Series C or convertible note bridge loan as we prepare for a full raise.

- Scale: commercial, industrial
- Sales diversification: healthcare, automotive
- R&D: sensor miniaturization



## Previous Investors

Infosys, 3M

\$3.5M to date



# Financials

Product	Total Sales
Speck	\$322,055.24
Royalty Revenue	\$37,495.05
Commercial AQ Monitor	\$21,120.00
Engineering / Consulting Fees	\$705,651.70
Total	= \$1,086,321.99

	Monthly Costs
Salary R&D	\$22,068.00
Salary SG&A	\$24,583.00
Overhead	\$15,496.00
Total	= \$62,147.00



# Projections

Industry/Market	2020	2021	2022	2023
<b>Smart Filter Sensor</b>	\$33,138.00	\$37,876.73	\$43,293.11	\$49,484.02
<b>Fortune 500 IAQ Monitor (July '19 Launch)</b>	\$175,000.00	\$200,025.00	\$228,628.58	\$261,322.46
<b>Engineering / Consulting Fees</b>	\$176,412.92	\$201,639.97	\$230,474.48	\$263,432.33
<b>Fortune 250 Industrial Product</b>	\$48,000.00	\$142,999.99	\$163,448.99	\$186,822.20
<b>Commercial AQ Monitor</b>	\$24,140.16	\$27,592.20	\$31,537.89	\$36,047.81
<b>Industrial Paint Booth</b>	\$0.00	\$1,000,000.00	\$2,143,000.00	\$4,592,449.00
<b>Total</b>	\$456,691.08	\$1,610,133.90	\$2,840,383.05	\$5,389,557.82

**Thanks!**

[www.airvizinc.com](http://www.airvizinc.com)

[sara@airvizinc.com](mailto:sara@airvizinc.com)