

Defense Need & Problem

At any point, more than 25% of USAF aircraft are grounded due to maintenance. Even though sensors onboard C-5, C-17, and other aircraft collect millions of time series data points, predictive maintenance algorithms struggle to diagnose maintenance problems. **This is mainly because the data collected is unlabeled and unvalidated. To this end, data professionals spend 80% of their time cleaning, validating, and labeling data (if they can).** The predictive maintenance system can tell when an aircraft underperforms/needs maintenance, but it cannot tell maintainers exactly why. Noise and other data issues can fool algorithms not trained with proper labels. **Our primary Air Force customer, Mobility and Training Aircraft Directorate at the Air Force Life Cycle Management Center, is all too familiar with this problem.**

Solution

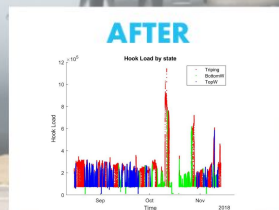
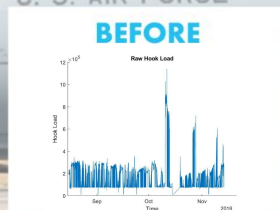
Automated data validation and human-centered labeling reduce the time data professionals spend cleaning and validating data from 80% to 20%. Properly labeled data provides nuanced, real-world insight from a dataset. This insight allows maintenance teams to specify maintenance problems and troubleshoot for solutions, reducing the need to ground aircraft for extended periods. Predictive maintenance schedules that rely on unlabeled data often indicate problems, but they cannot indicate what, where, and why the problem exists. For that, **the USAF needs human-centered data labeling.**

Pandata Tech's Data Quality Method System

1. **Preprocesses data using physics**— this facilitates the engineering of features into the data.
2. **Measures the states**— AI/ML measures the number of different states of sensor/data collection operations.
3. **Creates dynamic state labeling**— this allows users to distinguish between the operational states of components during data-gathering operations. (i.e., is the machine calibrating, experiencing downtime, in normal operations, or in extreme operations?)
4. **Divides data into subsets**— time series data are broken apart according to the predicted and labeled dynamic states.
5. **Labels event and fault data within subsets**— SME's and AI algorithms identify events and faults and use ML/AI/physics to label the data further.

Commercialization

Pandata Tech will build on our commercialization experience and offer predictive maintenance AI/ML customers a more robust system that can provide unmatched insight into maintenance issues. Like the DQM, initial customers will fall in the category of heavy industry and will rely on sensor data and IoT applications.



The leadership team at Pandata Tech has decades of experience working in data-intensive environments. Since Gustavo Sanchez and Jessica Reitmeier founded the company in 2016, Pandata Tech has earned over USD 1.25MM in revenue growing 283% yearly on average.