

WHITE PAPER | AUGUST 2024

A PARTNERSHIP FOR CIRCULARITY

*Enabling AI-powered fiber identification
for textile to textile recycling*

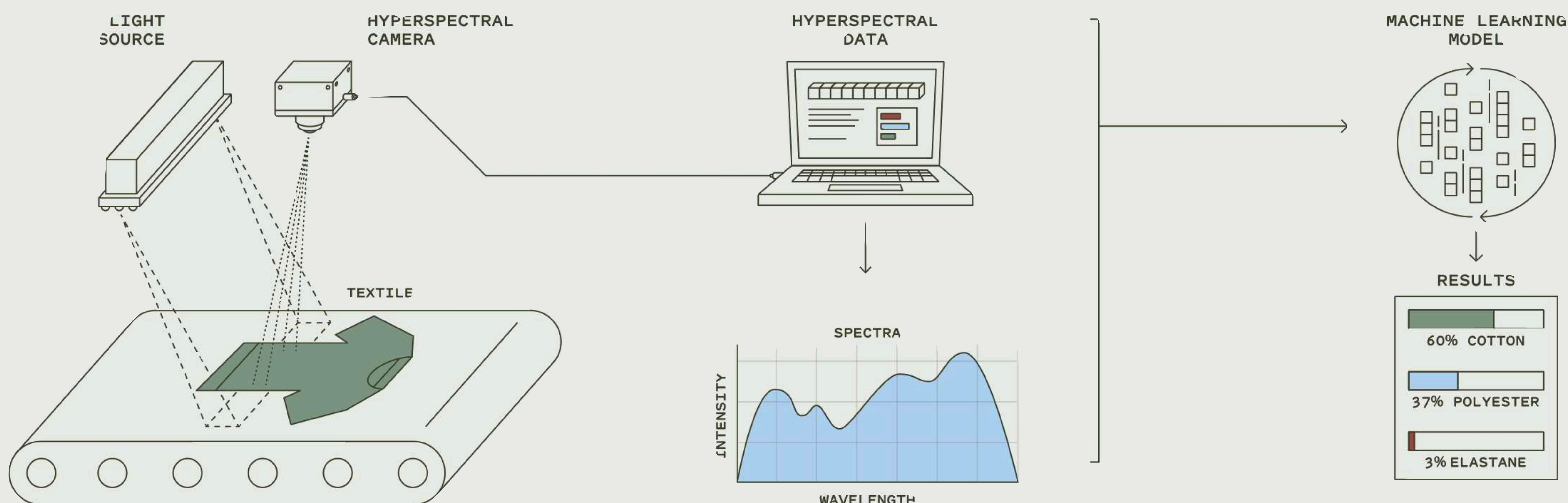
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ABOUT REFIBERD

Refiberd is a Bay-area based startup focused on creating technology that helps to eliminate textile waste from the apparel industry. We believe that a true solution to textile waste is going to require innovative applications of technology and cutting-edge processes. That's why we've developed a highly accurate textile fiber identification system from the ground-up that powers detection and sorting across a broad range of fibers to enable textile recycling.

Our product leverages powerful hyperspectral technology and an expert team to provide an AI-backed software & hardware solution that has the ability to sort textiles based on fiber content within 2% accuracy. Our technology is currently the only solution poised to unlock a major challenge in scaling fiber-to-fiber recycling for the textile industry at the scale needed to achieve true circularity.





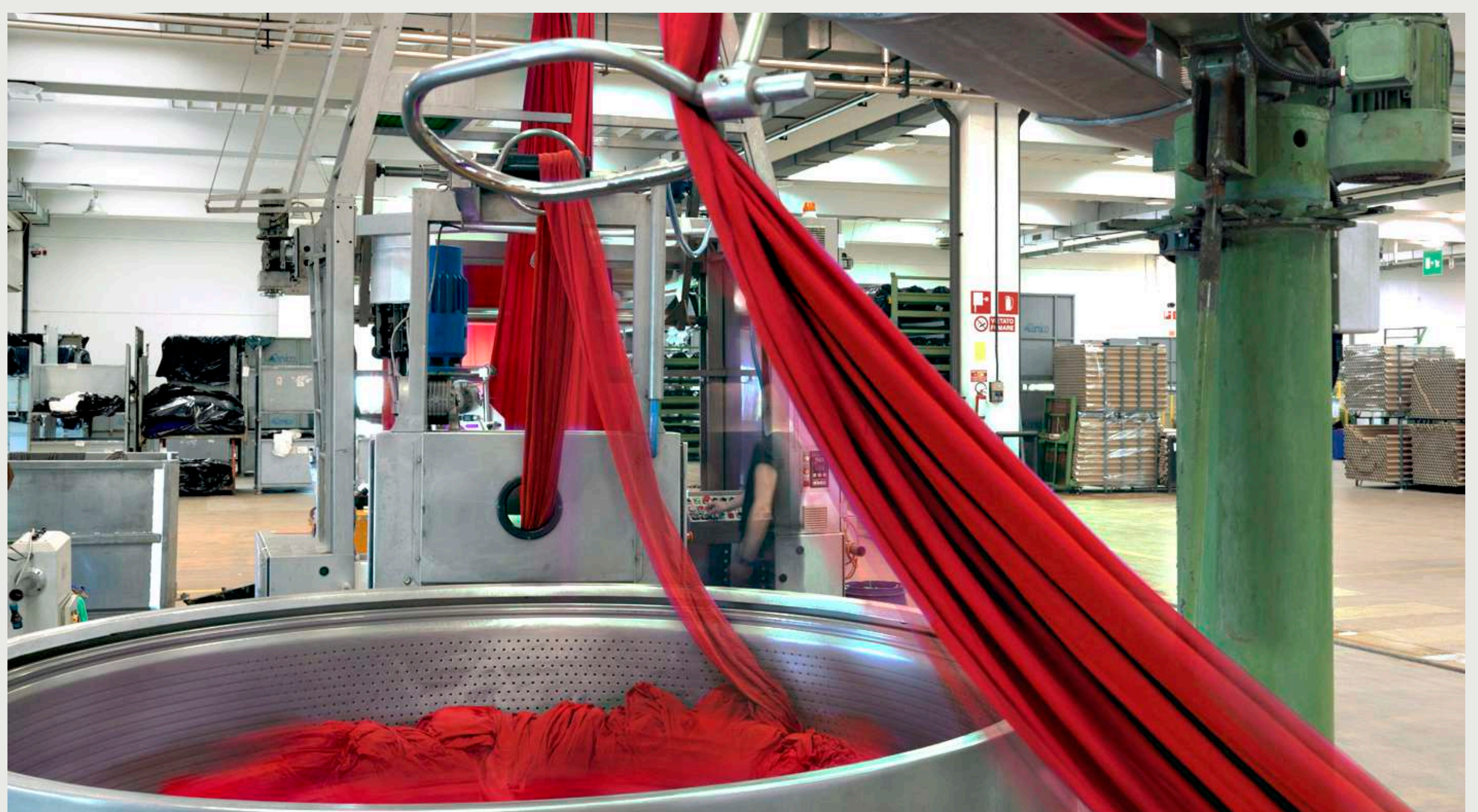
ABOUT PINE CREST FABRICS

Pine Crest Fabrics (PCF) is a global wholesale fabric supplier for the activewear market, including swimwear, dance, gymnastics, and athletic apparel. Established in 1978 by John Sheila, the company is headquartered in Portland, Oregon and operates a Sales and Art Development satellite office in Southern California. Today, Pine Crest Fabrics is the premier resource for wholesale stretch fabrics, offering an extensive range of textile products. Our inventory includes over 215,000 yards of stocked fabrics, a library of more than 10,000 prints, and over a thousand fabrics available for custom production.

We are committed to leading the activewear market by providing high-quality, eco-friendly, and comfort-oriented fabric

solutions. Pine Crest Fabrics continually updates its fabric styles to keep up with current trends and fashion. Our mission is to always do our best for our customers and to strive to be the top wholesale supplier of stretch-knit fabrics.

PCF works with mills that reduce waste, emissions and water usage to limit our impact on the environment. We strive to lead in supplying recycled, eco-friendly, certified sustainable fabrics. Most of our products are certified by systems such as Bluesign and OEKO-TEX; while our recycled materials, including REPREEVE®, are certified by GRS and others. Since 2018, we have sold fabrics made from over 4 million recycled plastic bottles.





A PARTNERSHIP FOR CIRCULARITY

Fiber to fiber recyclers, especially chemical recyclers, often require a high threshold of fiber content from their feedstock in order to achieve cost-effective yields of their product. Currently, recyclers must trust their feedstock suppliers to verify the content of their bales, or use highly inaccurate, time-consuming or costly equipment to perform quality assurance checks on their feedstock. With our technology, Refiberd aims to increase accuracy of sorting for textile waste sorters, as well as improve quality assurance on the side of the recyclers. To do so, we need to ensure our software is both fast and highly accurate. The

path to improved accuracy lies in a large materials library to inform our dataset which is used to train our machine-learning model. Our materials library needs to be robust, and we need to have high confidence in the fiber content of each material. Achieving a comprehensive and accurate dataset proved more difficult than expected, as approximately 41% of labels on textile goods are inaccurate ([Circle Economy, 2024](#)). Our team decided to go directly to the source, reaching out to manufacturers and fabric suppliers in hopes of collecting higher quality data for our development.

FROM DISCARD TO DATA

One PCF sample travels from the warehouse to Refiberd's facility, fulfilling a second life as part of Refiberd's materials library.



A discontinued PCF fabric



Diverted from landfill by sending to Refiberd



Sample is scanned + processed at Refiberd's lab



Now to be used continuously as part of Refiberd's dataset



RESULTS

The Pine Crest team has been instrumental in our progress towards developing a highly accurate software to power our sorting technology. With thousands of samples donated, we've been able to 100x the amount of viable samples in our dataset. We've seen a direct correlation between a higher quantity of quality samples and exponential improvements to the accuracy of our technology. It has been incredibly beneficial to

work in partnership with a team that shares our vision of a circular fashion industry, and who is willing to take steps to make that vision a reality. Thanks to Refiberd's partnership with Pinecrest and other textile suppliers, we've been able to grow our dataset to a point that allows us to enable fiber detection within 1-2% - a rate of accuracy previously unheard of in the industry.

“EACH YEAR, THE FASHION INDUSTRY PRODUCES 100 BILLION GARMENTS, WITH 87% ENDING UP IN LANDFILLS AND INCINERATORS, CONTRIBUTING SIGNIFICANTLY TO GLOBAL POLLUTION.

THIS STAGGERING AMOUNT OF TEXTILE WASTE UNDERSCORES THE URGENT NEED FOR INNOVATIVE SOLUTIONS LIKE REFIBERD'S TEXTILE-TO-TEXTILE RECYCLING TECHNOLOGY TO PROMOTE CIRCULARITY AND REDUCE OUR ENVIRONMENTAL FOOTPRINT.”

- Jenna Nesbit, PCF Product Strategy Director



WHAT LIES AHEAD

At present, Refiberd has completed five pilots with notable fiber to fiber recyclers, waste sorters, and fashion brands. We have plans to deploy our technology for customer use by the end of 2024, and continue to leverage partnerships with like-minded companies such as Pinecrest to continue to iterate and improve our software.

For more information on Refiner's technology, visit <https://refiberd.com/> or reach out to rebecca@refiberd.com to schedule a call.

To learn more about Pine Crest Fabric's sustainability projects or the fabrics they offer, visit <https://pinecrestfabrics.com/>.

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