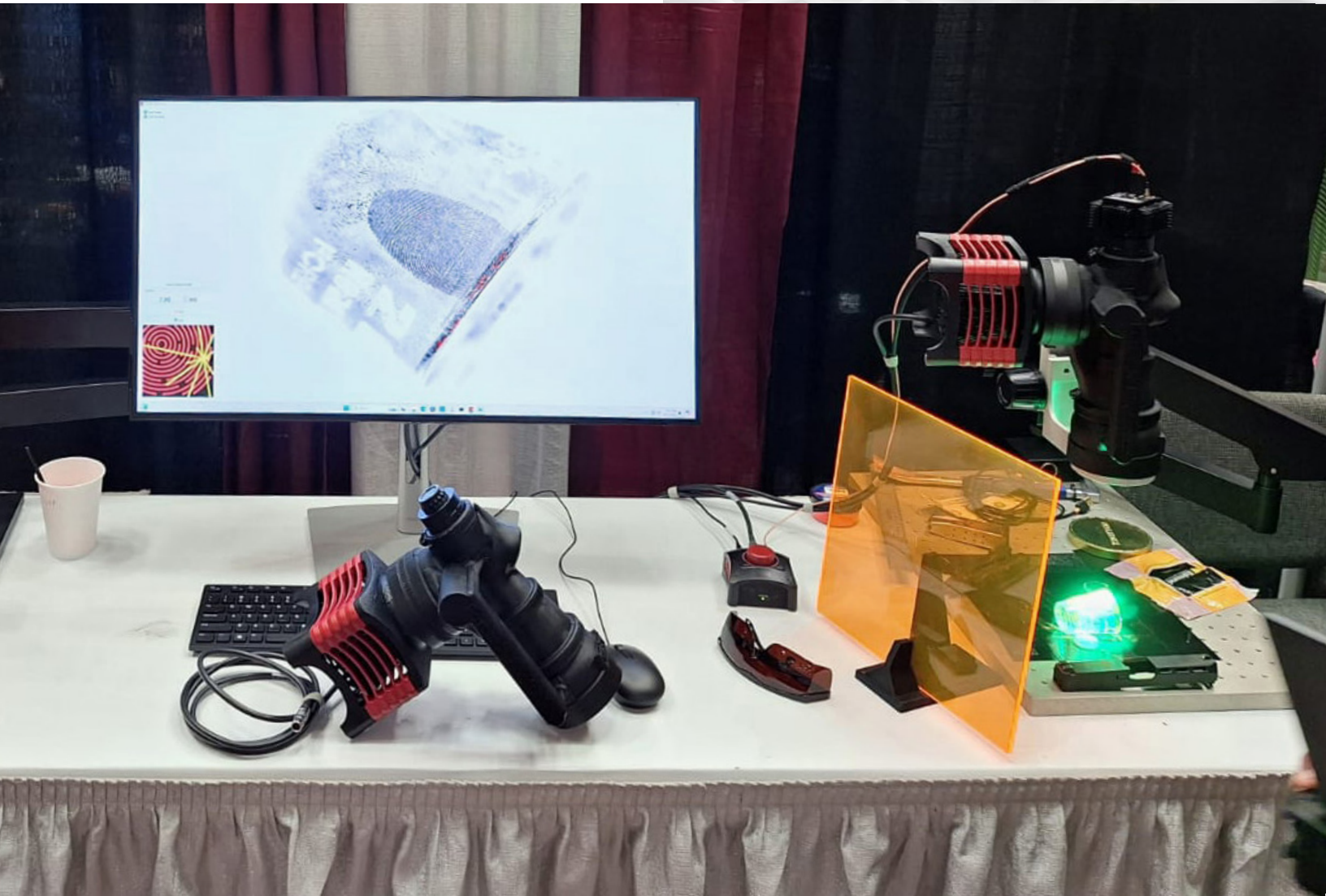
stratasys

CASE STUDY
P3™ DLP

Accelerating Crime Scene Investigation

How Forensic Photonics used additive manufacturing to self-fund and bring a new product to market quickly.



What is the most common phrase in TV crime dramas? “It’s a match.” A quick swab, a fingerprint dusting, and – “it’s a match.”

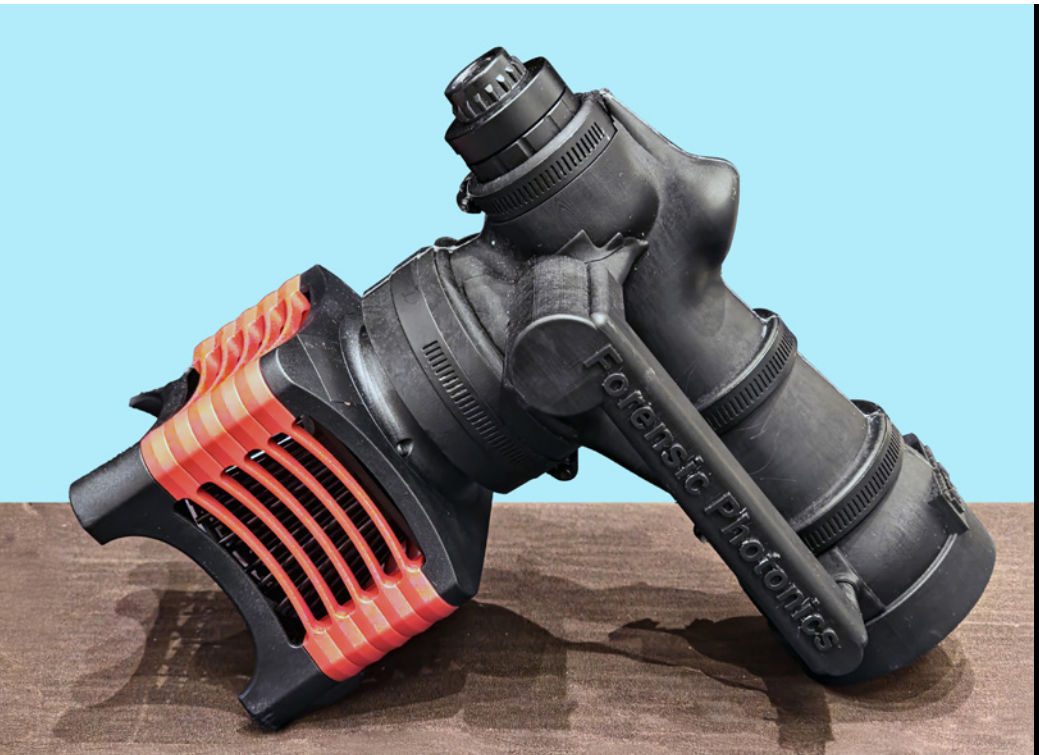
Forensic sample matching, such as fingerprints, is not always that simple. Forensic matching is a meticulous process, and it is often up to the courts to determine whether prints authentically match. However, the challenges begin even when detecting and imaging latent fingerprints on evidence.

Saving Time with Latent Fingerprint Imaging

For fingerprint detection, police officers have traditionally relied on two methods: using powders for the ‘tape and lift technique’ or capturing digital prints with imaging devices. While effective, traditional methods can be time-consuming and often rely on external forensic crime labs, which may have limited resources.

Digital imaging offers a promising alternative. The ability to capture and process fingerprints at the scene has long been a goal for police officers, who otherwise face delays waiting at crime labs. However, most current devices are not purpose-built for this task. They typically consist of general-purpose cameras or a mix of imaging devices and sensors, leading to optical inefficiencies, poor image quality, and difficulties obtaining reliable matches to be used for evidence.

A dedicated fingerprint imaging device like Forensic Photonics’ LIFT (Latent Imaging Fluorescence Technology) is the best solution. This device produces exceptionally clean and high-quality images that can be submitted for immediate automated analysis leading to a better chance of success. With a proper imaging device, police can get near-instant feedback on scanned fingerprints. In areas where local crime labs are backlogged, this can reduce wait times from months to minutes.



“There are a lot of tweaks and options to make it better, but I wouldn’t change the material or the production method.”

Geoff Lambright
Forensic Photonics

A Forensics Imaging Startup with a Solution

Geoff Lambright, founder of Forensic Photonics, set out to address this need. With a background in physics and microscopy and connections to latent fingerprint imaging experts, Lambright was well-equipped to make this product a reality.

Initially, Lambright thought he would need to raise significant capital, but an advisor suggested, “Just get your product on the table.” Opting for a self-funded approach, Lambright assembled the necessary optical equipment, sensors, and electronics. What remained, was creating a durable plastic housing for the device. The device's complex geometry made traditional metal cutting and milling nearly impossible, requiring a multi-part assembly and cost-prohibitive prototyping.

Additive manufacturing (AM) emerged as the ideal solution. Unlike traditional manufacturing, which benefits from economies of scale, AM excels in low and medium volumes where the cost per part remains consistent. AM also allowed Lambright to efficiently create prototypes, test, and iterate in real-time. He produced dozens of iterations using a hobbyist 3D printer until he had a demo-ready product.

Lambright showcased his LIFT device at the International Association for Identification (IAI) Conference, the premier event in the forensics industry. This exposure garnered significant interest and a successful test at the San Francisco Police Department brought the product closer to market readiness.

From Prototype to Finished Product: Choosing the Right Printer and Material

Despite the promising prototype, Lambright faced a critical issue: the plant-based plastic from his hobbyist printer lacked durability for field use. The device needed to withstand extreme temperatures and rough handling, typical in law enforcement operations. Any warping could compromise image quality, rendering the fingerprints unusable.

Lambright turned to Steve Schiffgen at GoEngineer for a solution. Schiffgen recommended the Origin® printer: “It’s an affordable way of producing production parts,” Schiffgen said. “You can do prototyping, and with the accuracy and surface quality of the printer paired with the strength properties of materials, you can actually print the final part itself, too.”

Selecting a suitable material was essential. Peter Moe-Lange, GoEngineer application engineer, suggested Somos® WeatherX™ 100, a material designed to withstand harsh weather conditions, UV exposure, and moisture.

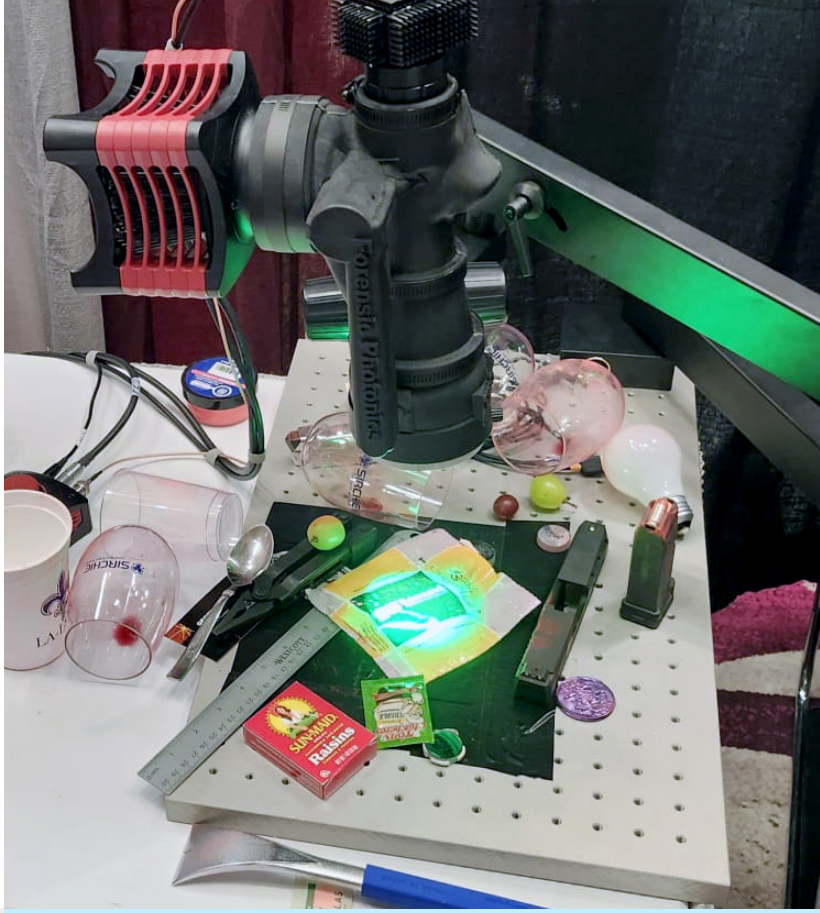
Initially concerned about cost, Lambright found the process within budget. After just two prints incorporating Moe-Lange’s suggestions, the product was perfected. “I followed his directions,” Lambright recalls, “and turned it around. The next one we got was perfect. Nailed it.”

A year later, Lambright returned to IAI not with a prototype but with a fully functional, ready-to-sell product. He had even developed two versions of the device. The speed of his development stunned both customers and competitors.

The Future of Forensic Photonics

With the initial sale to a rural county agency reliant on crime labs in different parts of the state, Lambright aims to scale up sales and production. As volume increases, Forensic Photonics plans to invest in an in-house Origin printer for prototypes and end-use products using Somos WeatherX 100.

Lambright envisions continuous improvement: “There are a lot of tweaks and options to make it better, but I wouldn’t change the material or the production method.” For Lambright, Stratasys’ patented P3™ DLP technology and its versatile materials are the perfect match for future iterations of the LIFT imaging device.



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Steve Schiffgen
GoEngineer

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