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## AFFIDAVIT OF ELIZABETH ROSENBERG

1. I am a Records Request Processor at the Internet Archive, located in San Francisco, California. I make this declaration of my own personal knowledge.
2. The Internet Archive is a website that provides access to a digital library of Internet sites and other cultural artifacts in digital form. Like a paper library, we provide free access to researchers, historians, scholars, and the general public. The Internet Archive has partnered with and receives support from various institutions, including the Library of Congress.
3. The Internet Archive has created a service known as the Wayback Machine. The Wayback Machine makes it possible to browse more than 450 billion pages stored in the Internet Archive's web archive. Visitors to the Wayback Machine can search archives by URL (i.e., a website address). If archived records for a URL are available, the visitor will be presented with a display of available dates. The visitor may select one of those dates, and begin browsing an archived version of the Web. Links on archived files in the Wayback Machine point to other archived files (whether HTML pages or other file types), if any are found for the URL indicated by a given link. For instance, the Wayback Machine is designed such that when a visitor clicks on a hyperlink on an archived page that points to another URL, the visitor will be served the archived file found for the hyperlink's URL with the closest available date to the initial file containing the hyperlink.
4. The archived data made viewable and browseable by the Wayback Machine is obtained by use of web archiving software that automatically stores copies of files available via the Internet, each file preserved as it existed at a particular point in time.
5. The Internet Archive assigns a URL on its site to the archived files in the format `http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL]` aka an "extended URL". Thus, the extended URL `http://web.archive.org/web/19970126045828/http://www.archive.org/` would be the URL for the record of the Internet Archive home page HTML file (`http://www.archive.org/`) archived on January 26, 1997 at 4:58 a.m. and 28 seconds (1997/01/26 at 04:58:28). A web browser may be set such that a printout from it will display the URL of a web page in the printout's footer. The date indicated by an extended URL applies to a preserved instance of a file for a given URL, but not necessarily to any other files linked therein. Thus, in the case of a page constituted by a primary HTML file and other separate files (e.g., files with images, audio, multimedia, design elements, or other embedded content) linked within that primary HTML file, the primary HTML file and the other files will each have their own respective extended URLs and may not have been archived on the same dates.
6. Attached hereto as Exhibit A are true and accurate copies of printouts of screenshots of the Internet Archive's records of the archived files for the URLs and the dates specified in the attached coversheet of each printout.



7. I declare under penalty of perjury that the foregoing is true and correct.

DATE: 11/02/2020

Elizabeth Rosenberg  
Elizabeth Rosenberg

## JURAT

State/Commonwealth of TEXAS )

☐ City ☒ County of Wise )

On 11/02/2020, before me, Shannara Ann Franzel,  
Date Notary Name

the foregoing instrument was subscribed and sworn (or affirmed) before me by:

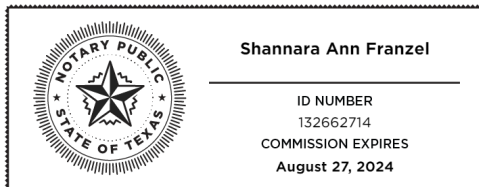
Elizabeth Rosenberg

*Name of Affiant(s)*

☐ Personally known to me -- OR --

☐ Proved to me on the basis of the oath of \_\_\_\_\_ -- OR --  
Name of Credible Witness

☒ Proved to me on the basis of satisfactory evidence: passport  
Type of ID Presented



WITNESS my hand and official seal.

Notary Public Signature: Shannara Ann Franzel

Notary Name: Shannara Ann Franzel

Notary Commission Number: 132662714

Notary Commission Expires: 08/27/2024

*Notarized online using audio-video communication*

## DESCRIPTION OF ATTACHED DOCUMENT

Title or Type of Document: Affidavit of Authenticity

Document Date: 11/02/2020

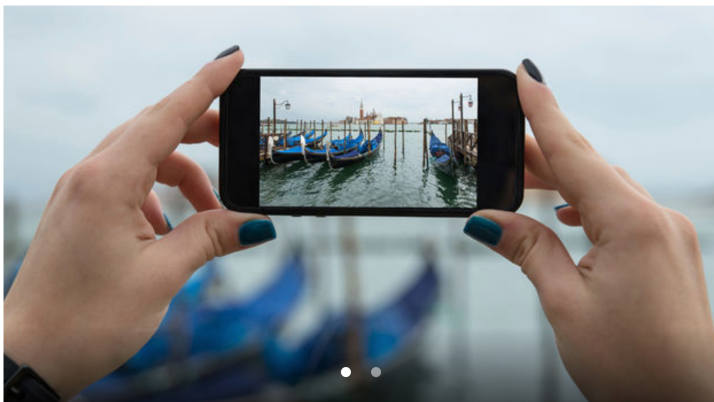
Number of Pages (including notarial certificate): 3

# Exhibit A

<https://web.archive.org/web/20161213134745/http://www.jpl.nasa.gov/news/news.php?feature=6697>

NEWS | DECEMBER 12, 2016

## NASA Technology is all Around You



JPL research into imaging technology helped to revolutionize digital cameras in the 1990s, eventually paving the way for smaller devices like phone cameras and GoPros.

[Larger image](#)

Next time you share an amazing GoPro video with a friend, consider that NASA made that technology possible.

The image sensors that would later be used in GoPros -- and in all modern digital cameras, including those in cell phones -- were first developed in the early 1990s at NASA's Jet Propulsion Laboratory, Pasadena, California. Those rudimentary sensor arrays used less power and were easier to mass produce than the standard methods of the time, helping to kickstart an entire industry.

Complementary metal-oxide-semiconductor (CMOS) image sensor technology, which grew out of NASA's efforts during that time to create "faster, better, cheaper" spacecraft, is just one of many tech transfer examples in the 2017 issue of [Spinoff](#). This annual publication highlights how space technology has been adopted by commercial industries, leading to benefits for people on Earth.

This year's Spinoff includes several unique success stories from JPL and other NASA centers.

### Digital imaging made wingsuit videos possible

In the 1980s, spacecraft imaging was done using charge coupled device (CCD) technology, which was integral to founding the digital camera industry. CCD acts as a kind of "bucket brigade," passing along a light-generated charge from pixel to pixel in a microchip's array. When the charge reaches the end of the array, it gets amplified and recorded.

A JPL engineer named Eric Fossum thought there was a better way. CMOS technology, which had changed microprocessors, allowed each pixel to also serve as a charge amplifier, using less energy and making each pixel more sensitive.

Major companies like Kodak and AT&T; Bell Labs eventually licensed the technology. Fossum, along with several JPL colleagues, founded a company called Photobit to develop it further. By the end of the decade, CMOS sensors had become the standard in the digital camera industry.

GoPro would later leverage the unique, low-power capabilities of CMOS to make cameras even smaller. That allowed video to be shot from the front of surfboards, the tops of helmets, and just about any place else you can imagine.

"It was a great example of a truly disruptive technology," said Sandor Barna, now vice president of core technologies at GoPro and a former employee at Photobit.

### Making dental X-rays safer and cheaper

CMOS imaging was also incorporated into dental X-rays by David Schick of Schick Technologies in Long Island City, New York. The high sensitivity of CMOS sensors meant lower doses of radiation were required per X-ray. There was also no need to develop film, making turnaround quicker and eliminating the need to handle the toxic chemicals used in film development.

The fact that CMOS sensor chips could be made smaller led to the development of X-ray

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sensors that could fit directly inside the patient's mouth.

#### Increasing crop yield with self-driving tractors

Farmers have been using self-driving tractors for more than a decade, largely due to a partnership between JPL and John Deere. Combining highly accurate, real-time GPS data with sensors on these tractors has led to "precision agriculture" -- using location data to determine how much of a harvest is coming from each part of a field. The result is lower costs to farmers and increased crop yields for each harvest.

Uncorrected GPS can be off by up to 30 feet due to data errors and other factors. By combining satellite and sensor data (which tracks things like soil moisture), accuracy increased to within four inches.

Though John Deere now operates its own precision guidance system, its early partnership with JPL helped the industry eliminate wasted seed, fertilizer and pesticide, while decreasing the amount of time it takes to harvest a field.

#### News Media Contact

Andrew Good  
Jet Propulsion Laboratory, Pasadena, Calif.  
818-393-2433  
andrew.c.good@jpl.nasa.gov

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