

# AI and photojournalism



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Two interpretation of the phrase "AI and Photojournalism" by Midjourney v5

“Photography is truth. And cinema is truth twenty-four times a second.”

*Le Petit Soldat*, 1960, Jean-Luc Godard

### Today's talk:

Two stories of my work with images

Mini tutorial on Generative AI

Impacts on disinformation, and mitigation via detection and content authentication

Impacts on photojournalism and mitigation via attribution

jean-luc godard in the style of a film by jean-luc go

@Robert Pless (fast)



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Warning: No graphic imagery, but these stories talk about searching for the body of a child murder victim, and identifying hotels used in sex trafficking

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Officers Jerry Thomas (left) and Frank Booker searching for evidence near the building where a girl's body was found Monday. San Louis Post-Dispatch

## Decapitated Body Of Girl Found In Basement

**By Bill McChellan**  
Of the Post-Dispatch Staff

The decapitated body of a young girl was found Monday afternoon in the basement of a crumbling, vacant apartment building at 963 Cassess Avenue.

The child, believed to be about 10 years old, was clad only in a yellow, V-neck sweater. Her hands were bound behind her back with what appeared to be a length of rope.

"Her head appeared to have been already cut off," said Detective Sgt. Stan Elov, of the police department's homicide division. "It was like somebody took a carving knife to her."

Police have not yet found the child's head.

Investigators called the case one of the most troubling in memory.

"Just when you think you've seen about everything, you see something like that," said Stanley Szabowski, a former homicide detective who now works as an investigator in the Medical Examiner's office. "I've been working murders for 20 years, and this has got to be the worst one I've seen."

Detectives spent Monday night searching the northwest St. Louis neighborhood in a vain effort to learn the identity of the child.

"It's strange, but we haven't had a single phone call yet from anyone reporting a little girl missing," said Sgt. Lloyd Huggans of the police department's juvenile division. Huggans said none of the approximately 20 children now listed as missing in St. Louis seemed to match the general physical description of the girl.

Police estimated the child, who was black, would have been about five feet tall.

The child's body was discovered about 2:30 p.m. by two men who had gone into the building to look for a piece of pipe, police said.

Officers, citing the lack of the blood at the scene, said it appeared the child had been killed at some other location and her body dumped in the basement of the apartment building.

An autopsy is scheduled for next week. Detectives said the results will indicate whether the child had been sexually molested and approximately when the killing had occurred.

"It doesn't look like she was there for long," one detective said. "The two arms were preserved, but it was 30 days there. It was too cold over 30 days."



## New hope in cold case of decapitated girl found in St. Louis, but now where's the body?

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March 17, 2013 12:45 am • By Christine Byers cbyers@post-dispatch.com 314-340-8087 ♥ 30



The Rev. John Heyward Jr. officiates during a funeral for an unknown girl on Dec. 2, 1983, as funeral director Jesse

**ST. LOUIS** • Police could never figure out who she was. Where she came from. Or who killed her. Now, they can't even find the grave holding the decapitated remains of a child slain 30 years ago — bones that offer the remote chance of a lead in a stone-cold case that otherwise has none.

Scavengers discovered the little girl, probably between the ages of 8 and 11, on Feb. 28, 1983, decomposing in an abandoned home on the north side. Her head was never found. Despite heavy publicity, nobody identified her. Police



# LITTLE GIRL FOUND

## Districts take steps to accept transfer



PHOTOS BY J.B. FORBES • jforbes@post-dispatch.com

The remains of a girl killed 30 years ago were unearthed Monday at Washington Park Cemetery in Berkeley. Just finding the grave was difficult, because the body was neither where records showed nor at the headstone placed for the girl later.

Lost grave of slain child is unearthed; police hope new testing will pinpoint her identity.

BY CHRISTINE BYERS  
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314-340-8087

**BERKELEY** • The steady pace of a backhoe peeling back layers of dirt in a cemetery here Monday all but ceased with the discovery of a simple staple.

It was the kind that held white cloth to a wooden casket used by the St. Louis medical examiner almost 30 years before to bury a headless child whose unsolved murder and unknown identity have haunted the region for decades.

The little piece of metal was the signal that a dozen police, forensic scientists and helpers were going to find the lost grave this time — and with it their last slim chance of learning the child's name, and finding her killer.

Digging exposed a bouquet of faux white flowers a florist had donated for the burial on Dec. 2, 1983. Then finally, a wooden casket. Medical examiner's



Dan Flynn, of St. Louis Livery, sifts through the dirt at Washington Park Cemetery on Monday, looking for evidence that they were getting close to where they thought the girl was buried. WU researchers used aerial images from the U.S. Geological Survey for clues on where to dig. A staple and some faux flowers pointed the way.

See BODY • Page A5

After ruling, n are trickling i unaccredited

BY ELISA CROUCH  
ecrouch@post-dispatch.com  
314-340-8119

After turning away kids years, school superintendents say they plan to be accepting transfer requests this summer from the few what could be hundreds not thousands — of students seeking to leave two unaccredited districts in north St. Louis County.

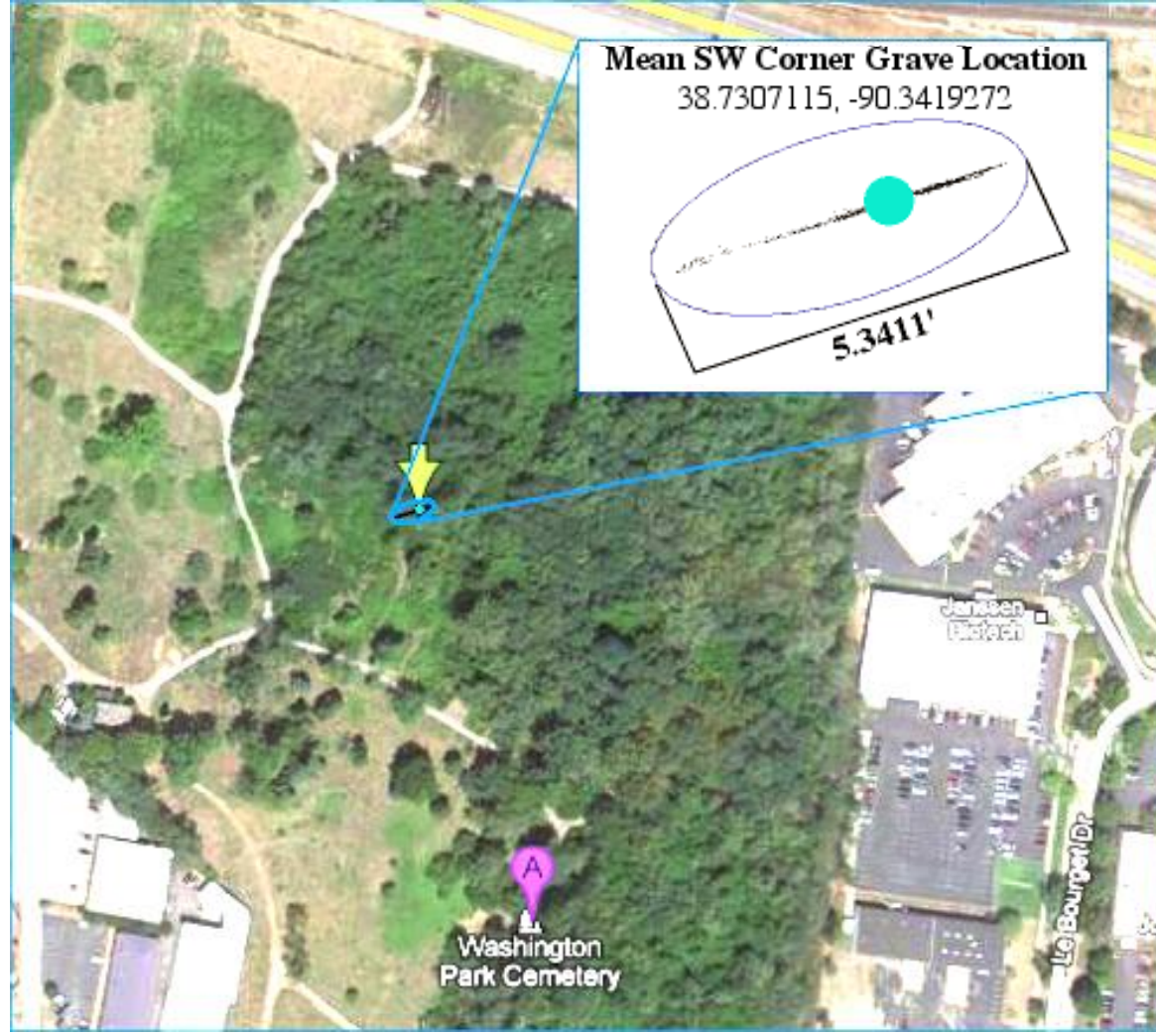
But first the superintendents are working toward shared protocol for handling the transfers, which were held last week by the Missouri Supreme Court.

Already such requests begun trickling in from parents in the region's two accredited school systems — Normandy and Riverview Gardens — wishing to send their children to Clayton or Florissant districts.

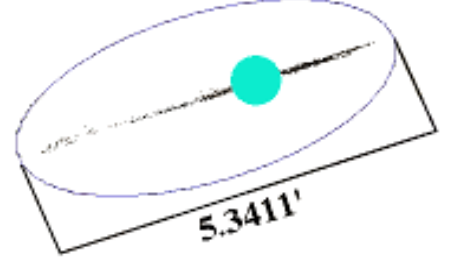
Districts in the area "work to comply in that is in the best interests of all children and families," according to a statement from operating School District of Greater St. Louis, which agreed to by about 100 superintendents and school representatives from the region.

This involves a decentralized way to call this summer enrollment information to them avoid call

See TRANSFER



Mean SW Corner Grave Location  
38.7307115, -90.3419272



Washington Park Cemetery

Janssen Plot

Le Bourget Dr

## Problem context:

Human traffickers operate out of hotels

Traffickers advertise online with images taken inside hotel rooms

Identifying the specific hotels used can help:

- Find victims
- Document crime locations
- Understand patterns of behavior and criminal networks

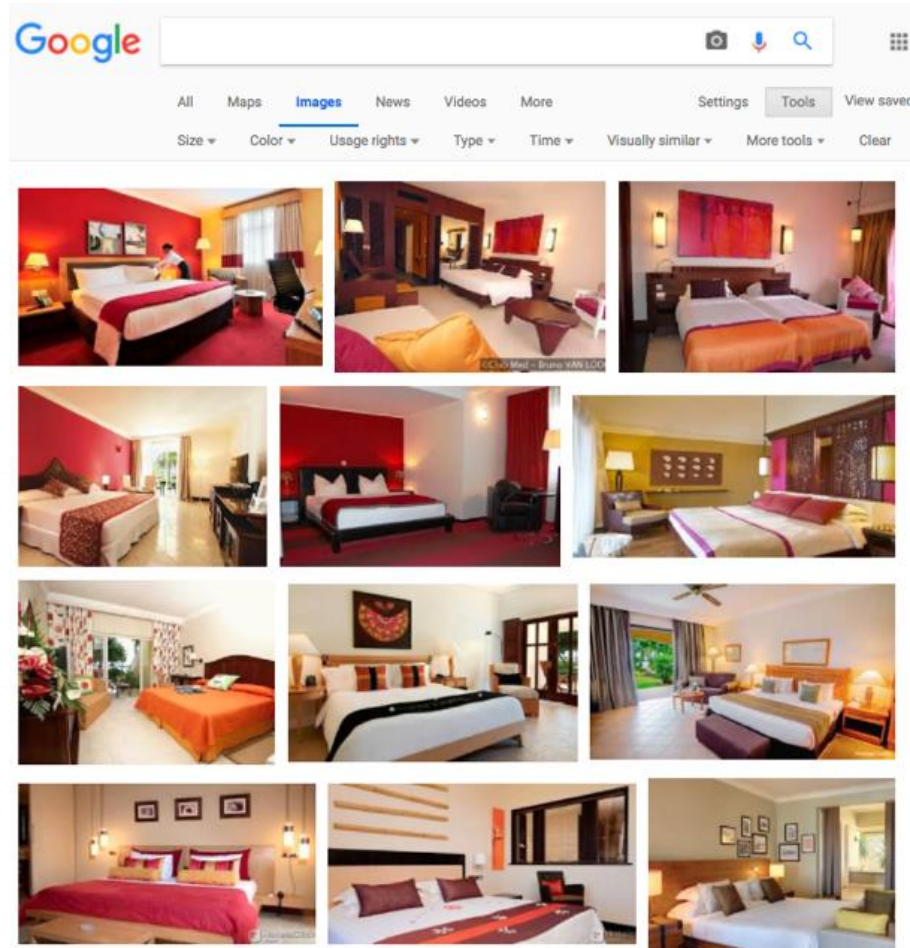


Follow

This is a hotel room. Do U know which one?  
This info can help police solve a child sexual abuse case. Tell us on  
[europol.europa.eu/stopchildabuse ...](https://europol.europa.eu/stopchildabuse)



7:00 AM - 11 Aug 2017



Follow

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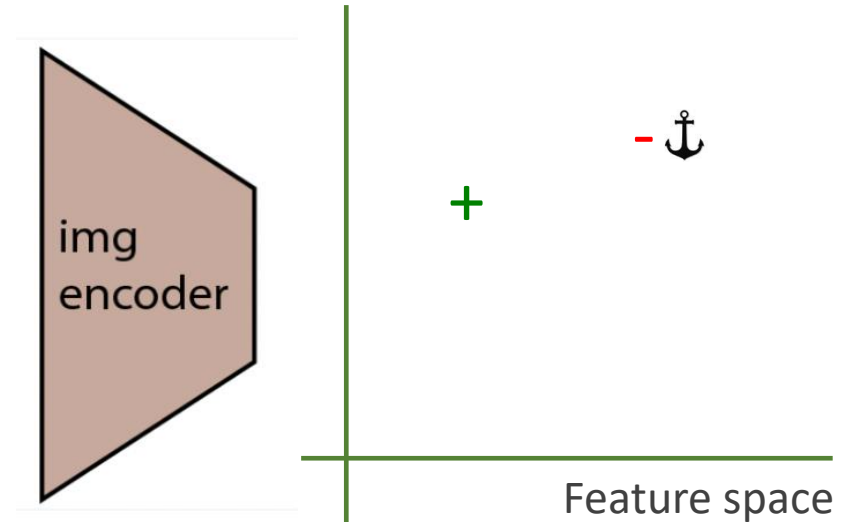
7:00 AM - 11 Aug 2017



# AI approach to training image retrieval

Convert image to features with a (Deep Network) encoder, and train it so that:

1. two images of the same hotel have features that are similar, and
2. images of different hotels are different.



# TraffickCam

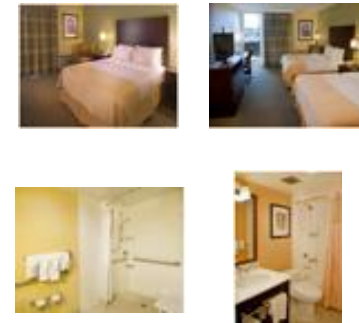
- iOS/Android
- Over 250,000 downloads
- 356,575 images
- 32,018 hotels
- Average of 212 new images a day
- Combined with online data:
  - 2.92 million images
  - 516,939 hotels worldwide

TraffickCam

Help fight trafficking by uploading photos of your hotel room. These photos will be used to determine where perpetrators of sex trafficking are committing their crimes.

Holiday Inn St. Louis - Forest Park/Hampton Av

123



You can submit up to four photos by tapping on the camera icons



TraffickCam



About

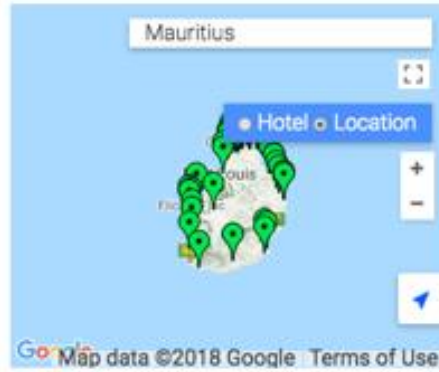


Contact

### Search



Edit



Include Keywords

Exclude Keywords

Separate keywords by commas

Search with Image

Search without Image



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# How DALL-E works

Two key ideas.

Idea 1: Train an embedding on pairs of images and text.

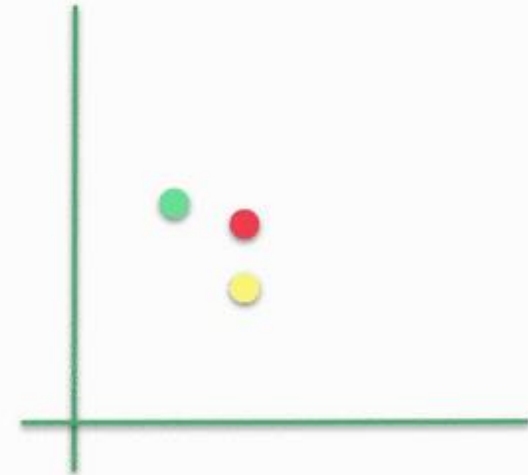
The Image embedding maps images to a feature space.

The text embedding **also** maps text to the same features space.

The image embedding and text embedding are trained to that matching image, text pairs are mapped to similar place. One common version of this is called a *CLIP embedding*.



Two people on the mountain



# How Dall-E works: the CLIP embedding

Find the text closest to an image as a way to label images.



A cat

A dog

A nuclear submarine



# How Dall-E works

- You can also train another network to translate back from a feature to an image.
- Now you can put any sentence in and get an image out



“Spider-Man from Ancient Rome”



# Seriously – How can this possibly work?

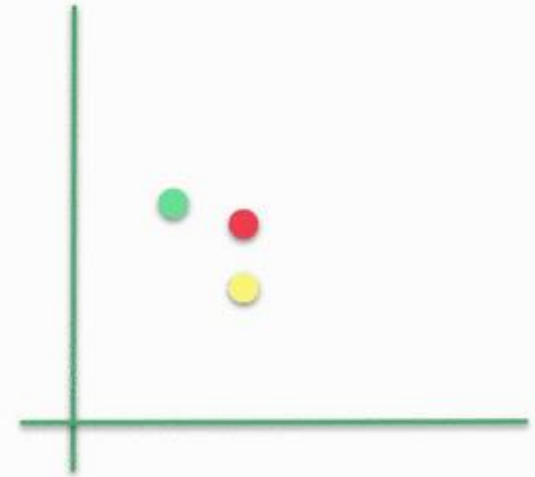
Training is not done with a few (text, image) pairs, but with 400 millions pairs of images.

Not public what that dataset is.

“Stable Diffusion” the engine behind mid-journey, work in similar ways, and is trained on 1.2 Billion image, text pairs.



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# 90 miles project


- <https://www.airlab.co/90-miles>
- Photojournalist Michael Brown created set of “fake” images of Cuban life:

The Cubans who attempt the crossing are incredibly resourceful, as necessary to the journey and as reflected in the rafts and boats of tubes, random pieces of wood and plastic, household supplies, etc.



AIRLAB

Home 90 Miles Project Details Gallery

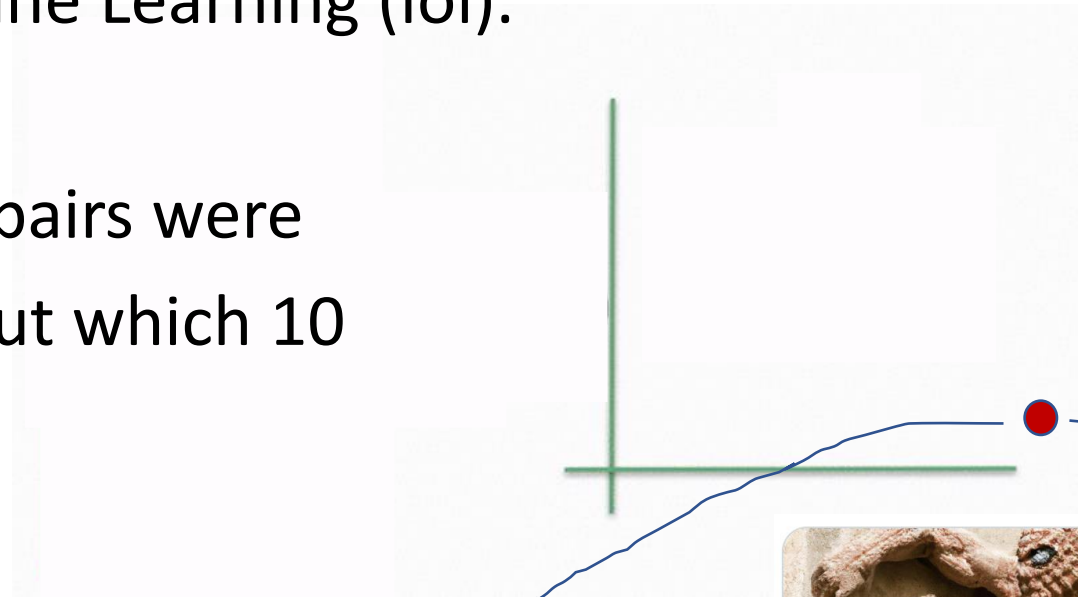


The Cubans who attempt the crossing are incredibly resourceful, as necessary to the journey and as reflected in the rafts and boats often assembled from inner tubes, random pieces of wood and plastic, household supplies, etc.

“It goes without saying that society must maintain the integrity of the photograph. We must create barriers around certain A.I. generated output” --- Michael Brown

# Attribution

- Very new idea in Machine Learning (lol).
- Yes, 400 million image pairs were used to train a model. But which 10 were most important?



“Spider-Man from Ancient Rome”



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Deep Fakes  
Completely fabricated (but realistic) content.  
Fabricated video is coming soon.

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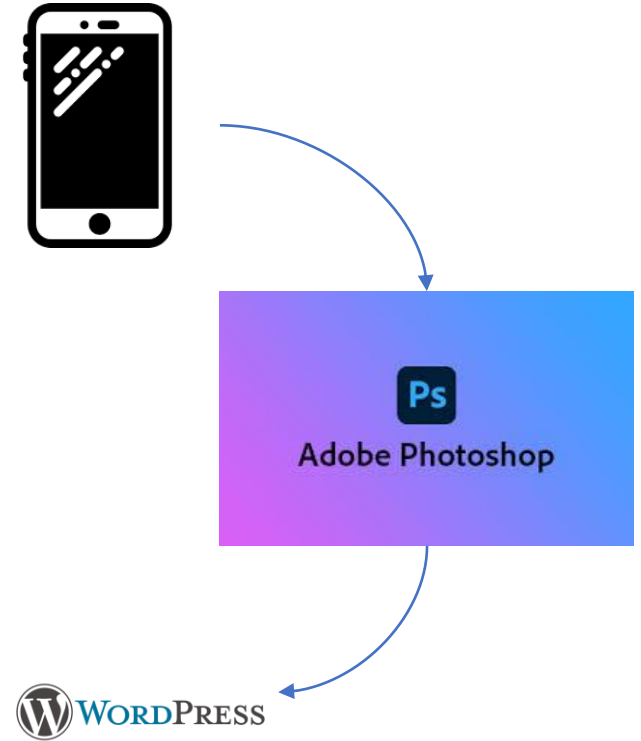
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“...society must maintain the integrity of the photograph...” --- Michael Brown

The screenshot shows the C2PA website header with the logo and navigation links: About, FAQ, Guiding Principles, Specification, and Me. The main content area features the text: "An open technical standard providing publishers, creators, and consumers the ability to trace the origin of different types of media." Below this is a "Learn more" button with a right-pointing arrow. The footer contains logos for Adobe, BBC, intel, Microsoft, and S.



# Mitigation

- If provenance is lost, how can you verify an image?
  - Very interesting research relating one image to the constellation of other images, time-stamps and satellite data.
  - Search technologies to find original images that were mixed or altered
- More robust provenance
  - Robust semantically based fingerprinting, less susceptible to things like jpg re-encoding
- Detection of what parts of the images have been changed
  - New work with deep networks computing consistency of semantic features, I'm most familiar with work by Hany Farid that evaluated the lighting at locations in the image to find regions with inconsistent lighting.

# Thank you



## Initial:

- NSF (RI-IIS 0546383): "CAREER: Passive Vision, What Can Be Learned by a Stationary Observer",
- NSF (CGV-1111398): "Analyzing Images Through Time"
- Sisters of St. Joseph: "Crowd Sourcing and Image Matching Tools to Fight Sex Trafficking"
- I/ARPA: "Geolocating found imagery"
- NIJ: Object Search to Fight Sex Trafficking
- Adobe

Abby Stylianou  
Saint Louis Univ.



Richard Souvenir  
Temple University



## Current:

NSF NRT Designing Trustworthy AI Systems  
NSF AI Institute: Trustworthy AI in Law and Society

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