Ethics and Computational Photography

Fredo Durand
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Final p-set

- Generous with extensions

What next?

- Optics
  - https://meche.mit.edu/featured-classes/optics
- Computational Imaging
  - https://computing.mit.edu/cross-cutting/common-ground-for-computing-education/common-ground-subjects/c27-c67-computational-imaging/
- Computer Vision / Deep learning
  - 6.7960 Deep Learning ; 6.4300 Introduction to Computer Vision ; 6.8300 Advances in Computer Vision ; 6.S184 IAP Course: Flow matching and diffusion models (IAP)
- Signal processing, linear algebra, numerical methods
  - 6.3000 ; 6.3010 Signals, Systems and Inference ; 6.7350 ; 6.C06[J]
- Computer Graphics
  - 6.4400 Computer Graphics

Problems as Fredo sees them

- Easy acquisition and distribution of **unretouched** photos and videos
  - Revenge porn
  - Teen self image and depression (although some of that instagram data is sketchy)
- Deep fakes and fake porn
- Journalism in general (choice of coverage, angle, captions)
- Concentration in journalism, death of local papers, click incentives
- Unrealistic beauty standards (but retouching is only one part)
- New: AI image synthesis, theft of artist imagery

Mesages

- Photo manipulation exists
- Manipulation can be problematic
  - Beauty, photojournalism, propaganda, law, deep fake porn
- Context matters
- As computer scientists, we need to think about the tools we build
  - Some ethical questions are obvious
  - Others less so

An abbreviated history (or zoo?) of photo manipulation

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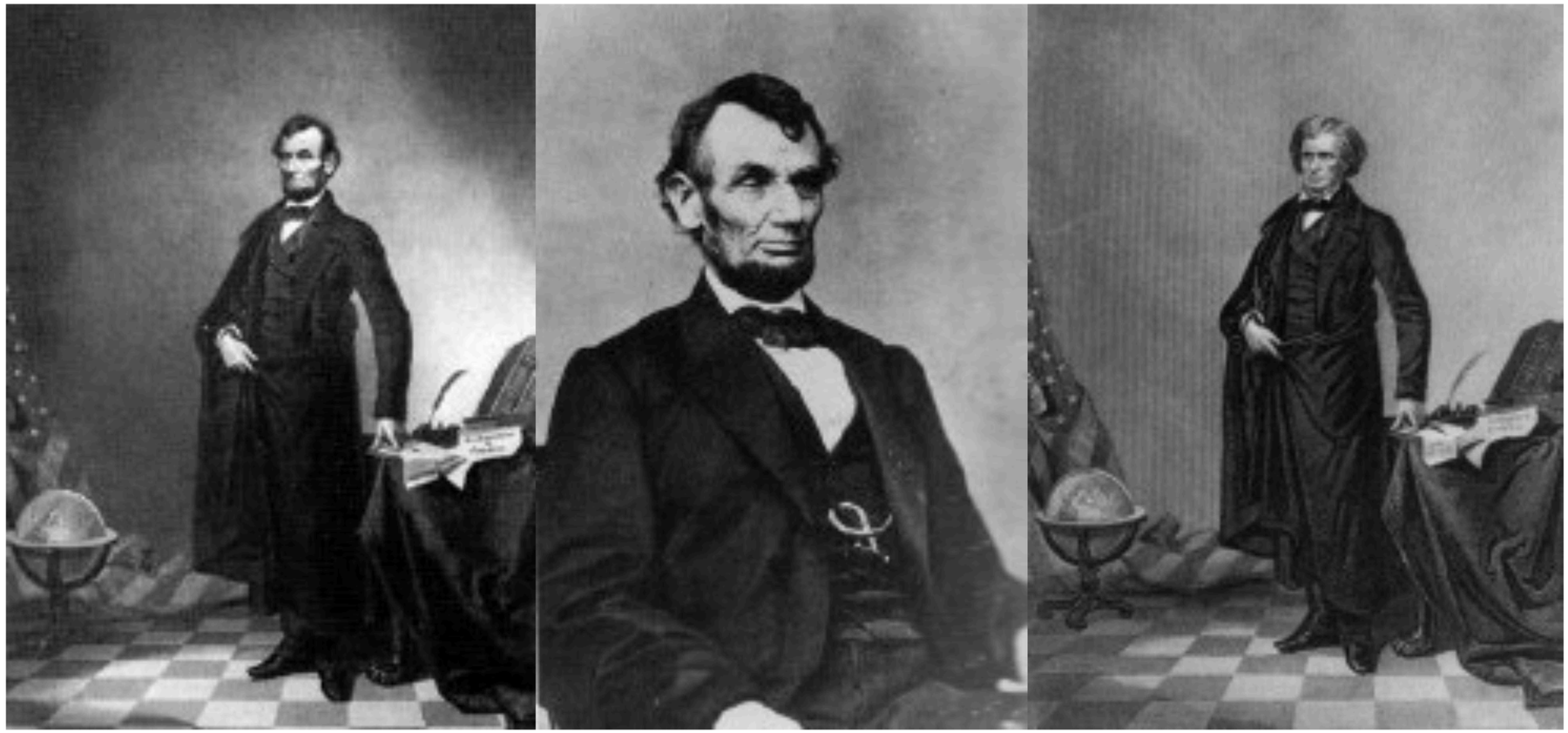
See also https://en.wikipedia.org/wiki/Photo_manipulation?fbclid=IwAR08aJPk9mVXY3P8a_ADX_4jVwsvCUC_C2sum4-SL4n5tWU_nADUuzFskKw

After Yezhov’s fall

Lincoln

Lincoln/Calhoun

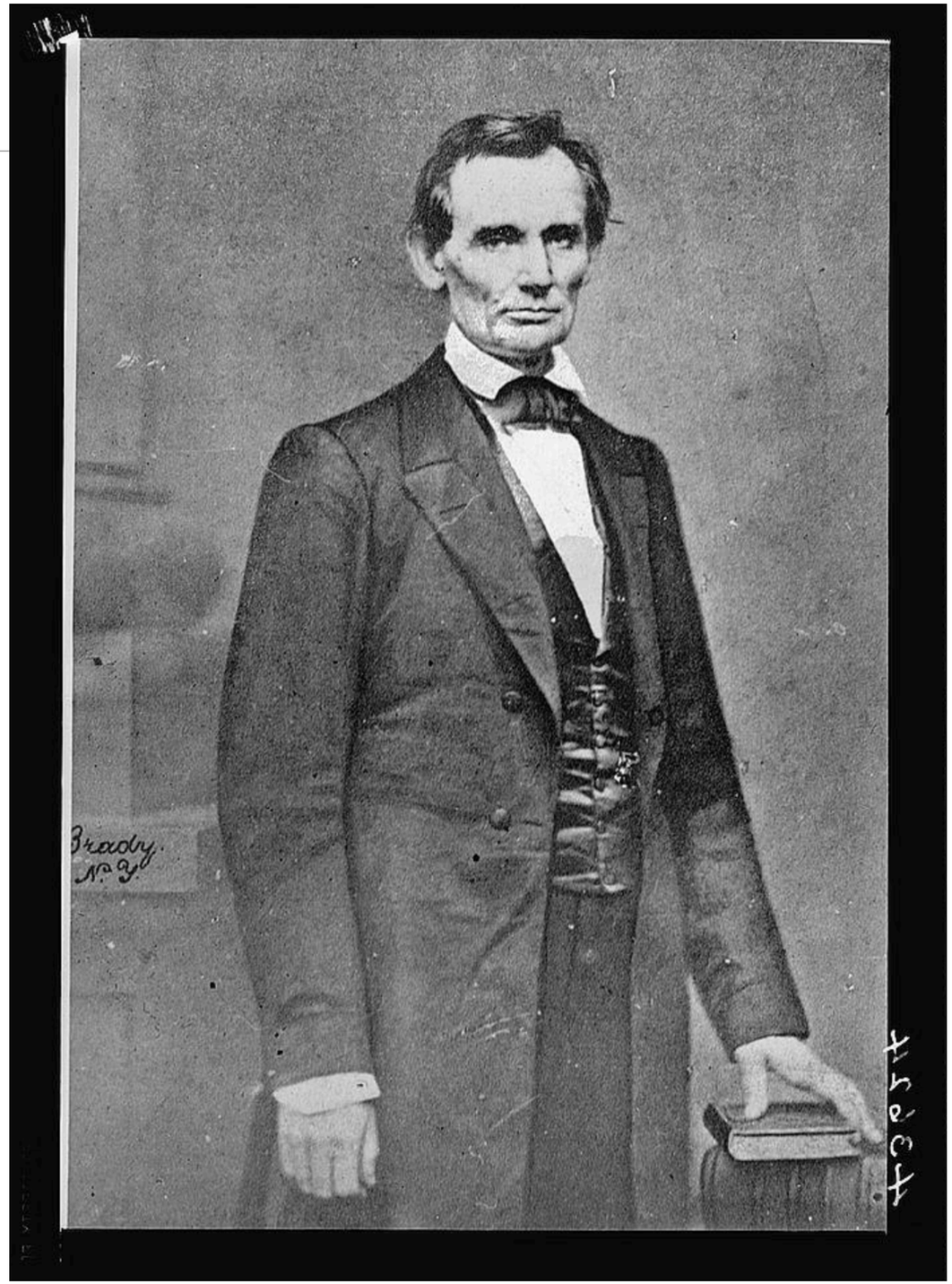


- https://iconicphotos.wordpress.com/2010/04/24/lincoln-calhoun-composite/
- https://www.atlasobscura.com/articles/abraham-lincoln-photos-edited
- Ironic because Calhoun was a Southerner in favor of Sates Rights who inspired secessionists. “In the Calhoun image, the papers on the table say “strict constitution,” “free trade,” and “the sovereignty of the states.” In the Lincoln image, these words have been changed to read, “constitution,” “union,” and “proclamation of freedom.”

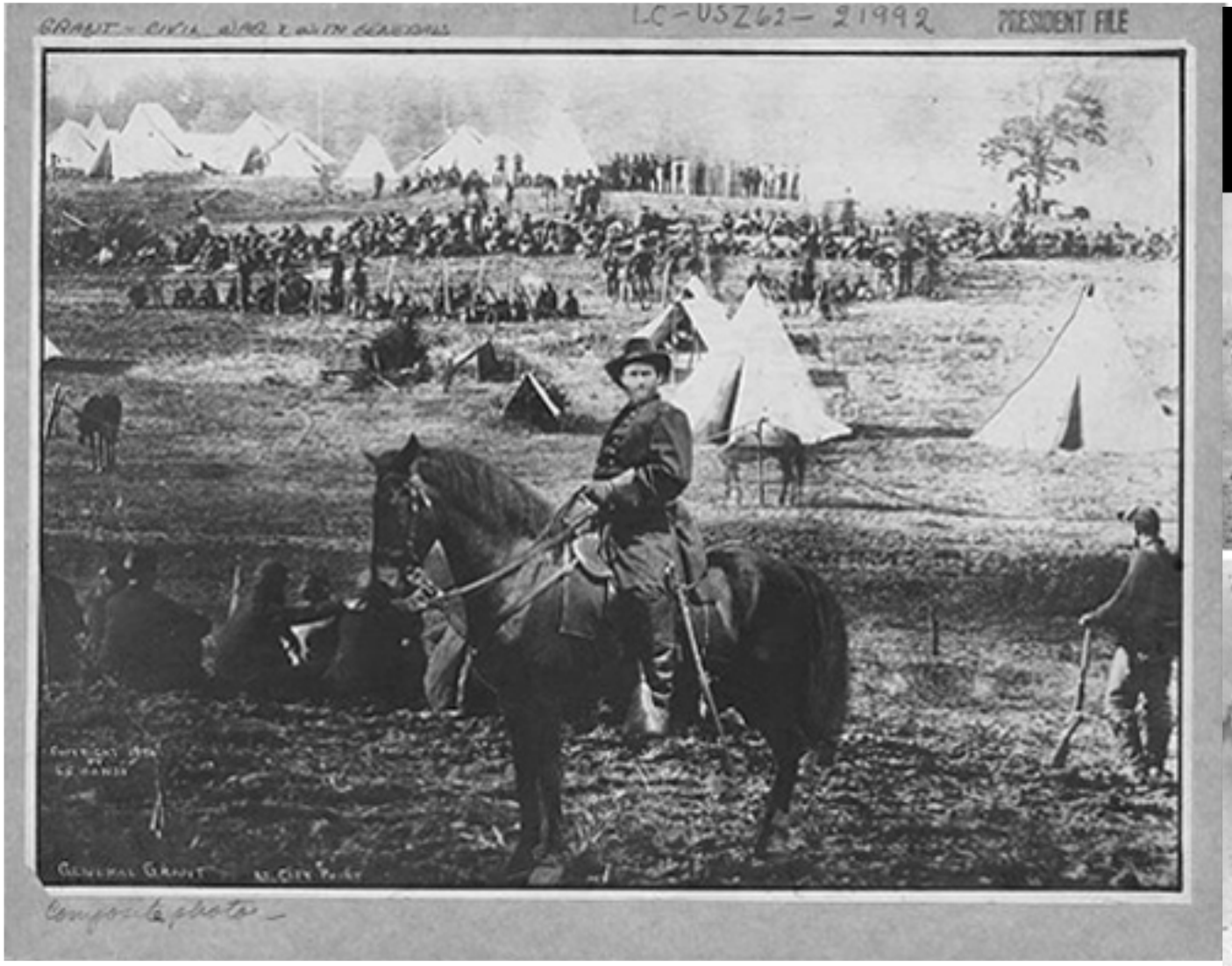
More Lincoln

- https://www.atlasobscura.com/articles/abraham-lincoln-photos-edited

- Lots of clever lighting/posing/retouching

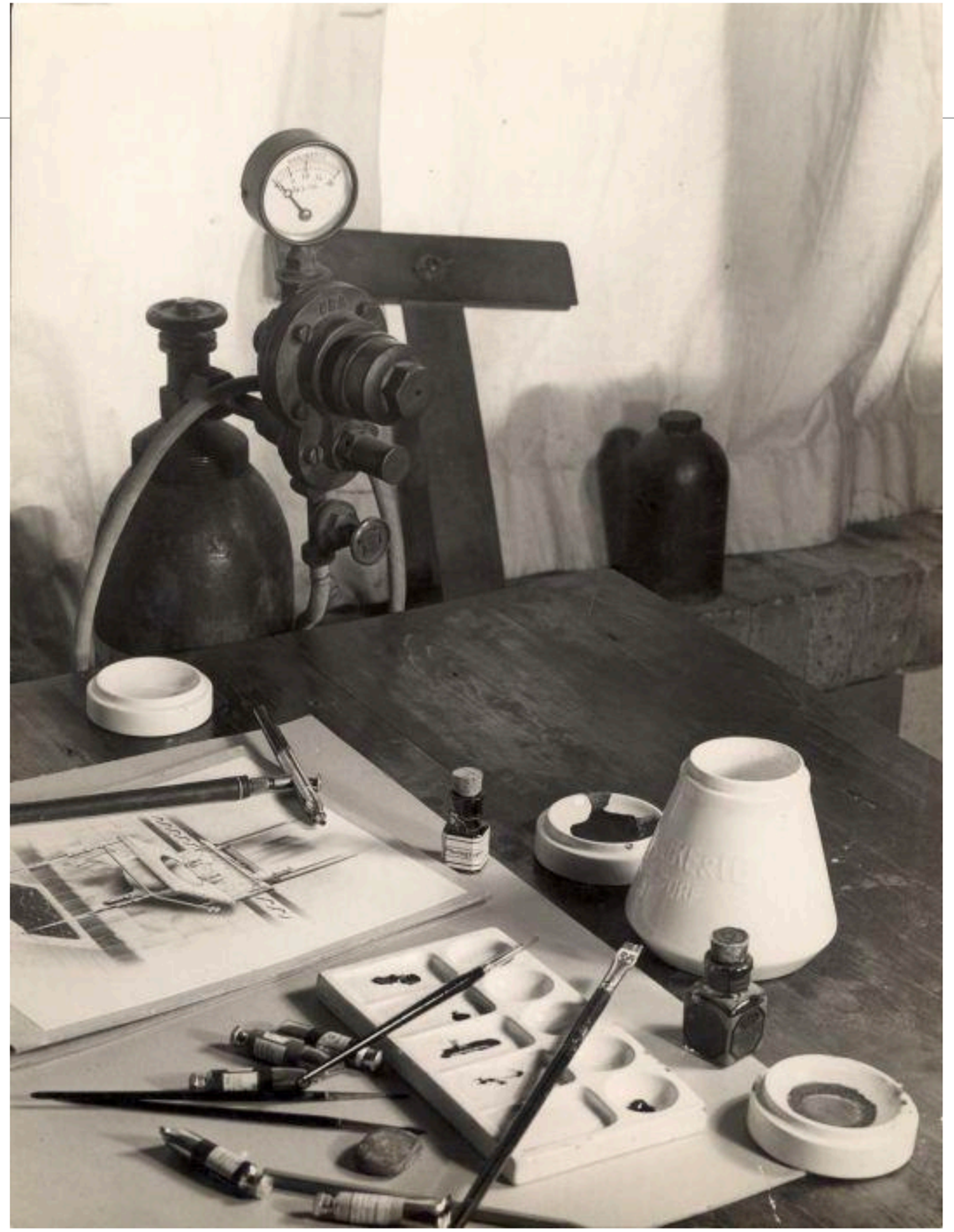


In this 1944 photograph of Benito Mussolini...
...the horse handler was removed to make it look more heroic.
CRACKED.COM



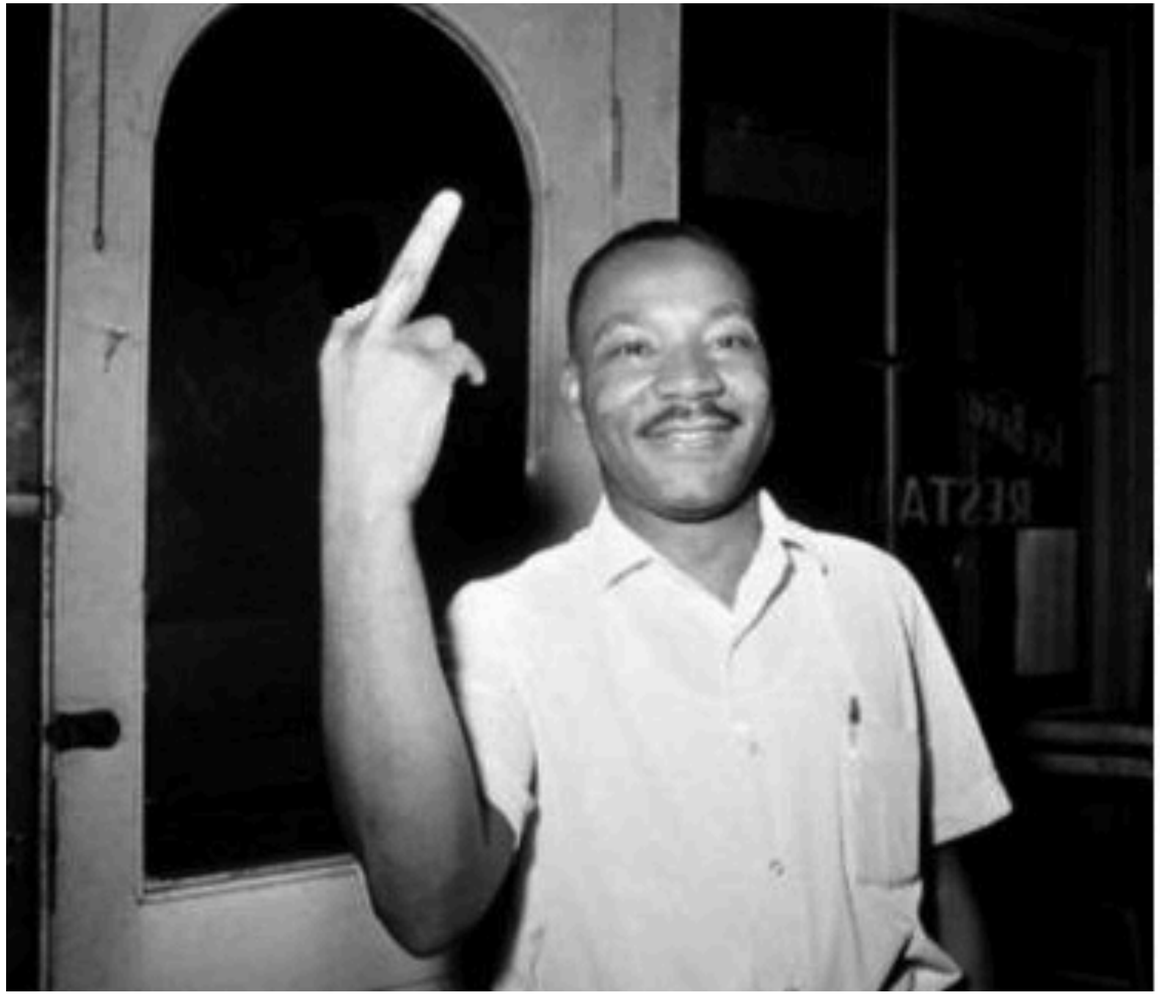
This picture of President U.S. Grant is pretty ambitious for someone who's never heard of Photoshop. It's made up of three different shots: A background of Confederate Soldiers captured at Fisher's Hill, the body and horse from a picture of Major General Alexander M. McCook, and the portrait of Grant shown at right.

Old tools

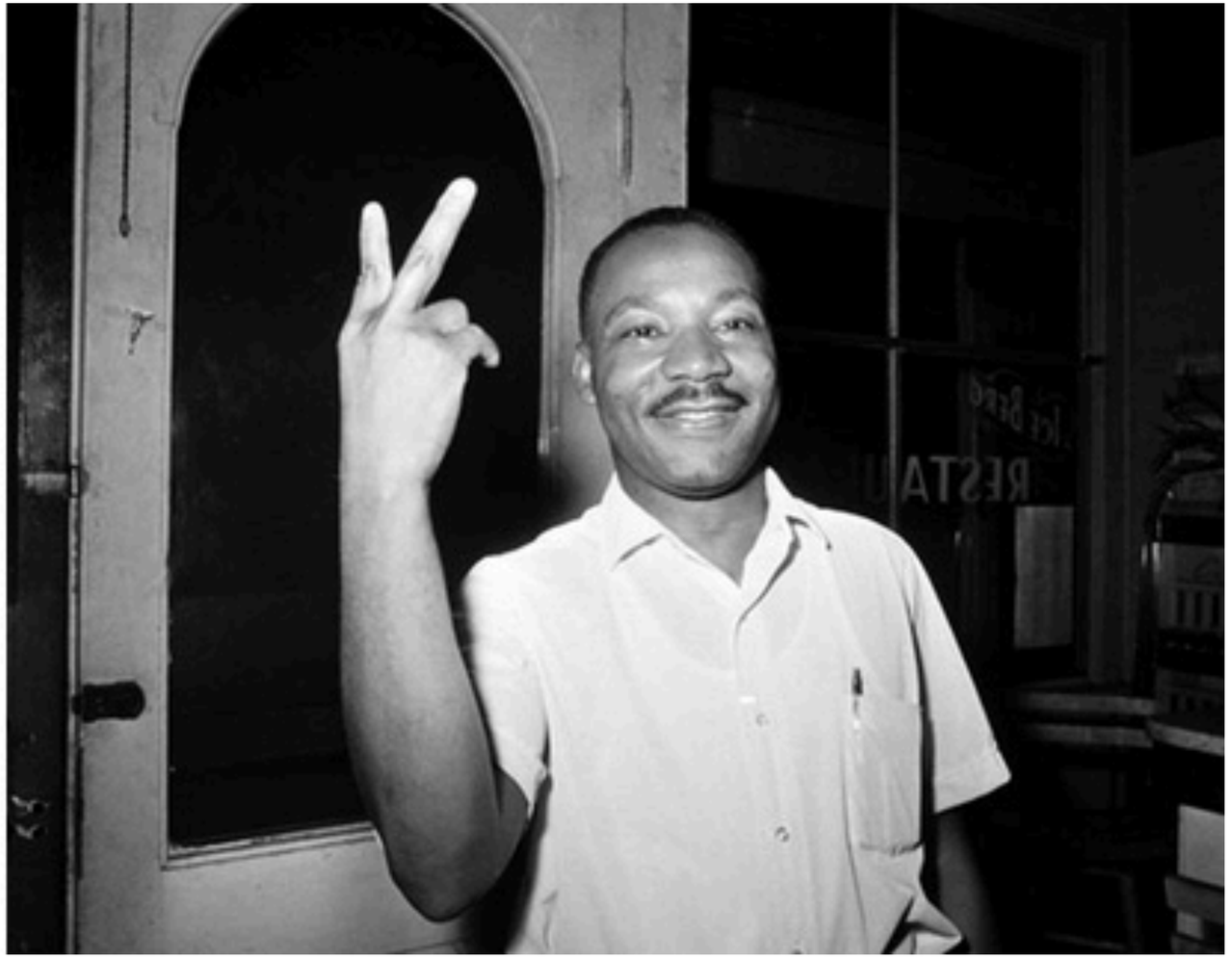


Rolling Stones

MLK Jr



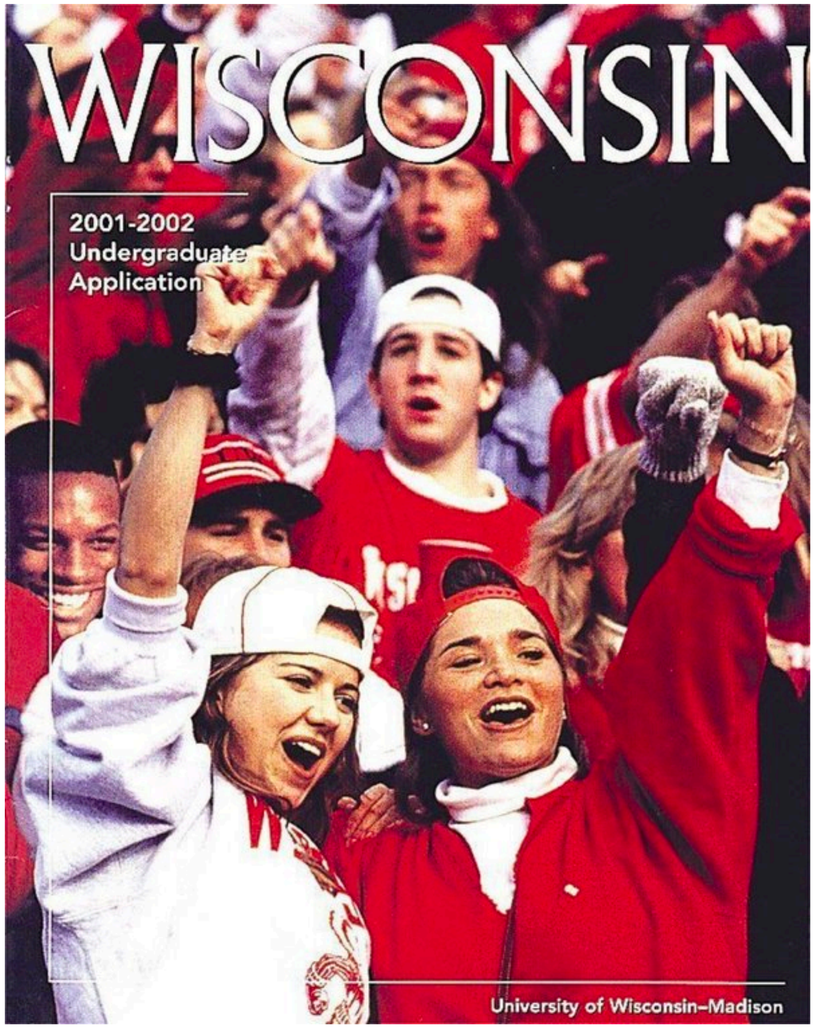
Fake



Original

University of Wisconsin Booklet Photoshopped to Add Black Student

- https://www.snopes.com/fact-check/photo-finish-2/
- https://thesocietypages.org/socimages/2009/09/02/doctoring-diversity-race-and-photoshop/
-



- https://petapixel.com/2019/06/13/gq-ran-a-group-pic-of-tech-titans-that-had-women-photoshopped-in/

GQ Ran a Photo of 'Tech Titans' That Had Women Photoshopped In

JUN 13, 2019 MICHAEL ZHANG

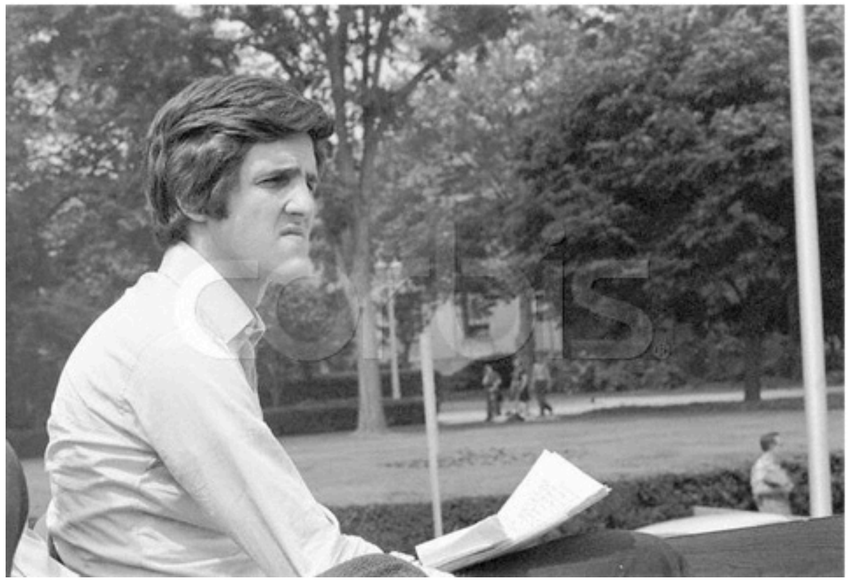
Share 361 Tweet

52 COMMENTS

Kerry/Fonda

Fonda Speaks To Vietnam Veterans At Anti-War Rally

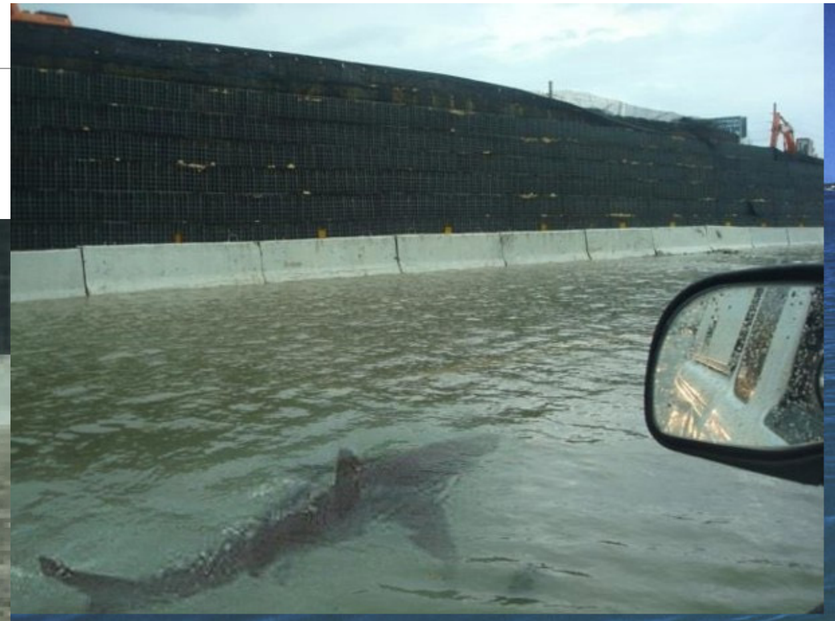
Actress And Anti-War Activist Jane Fonda Speaks to a crowd of Vietnam Veterans as Activist and former Vietnam Vet John Kerry (LEFT) listens and prepares to speak next concerning the war in Vietnam (AP Photo)

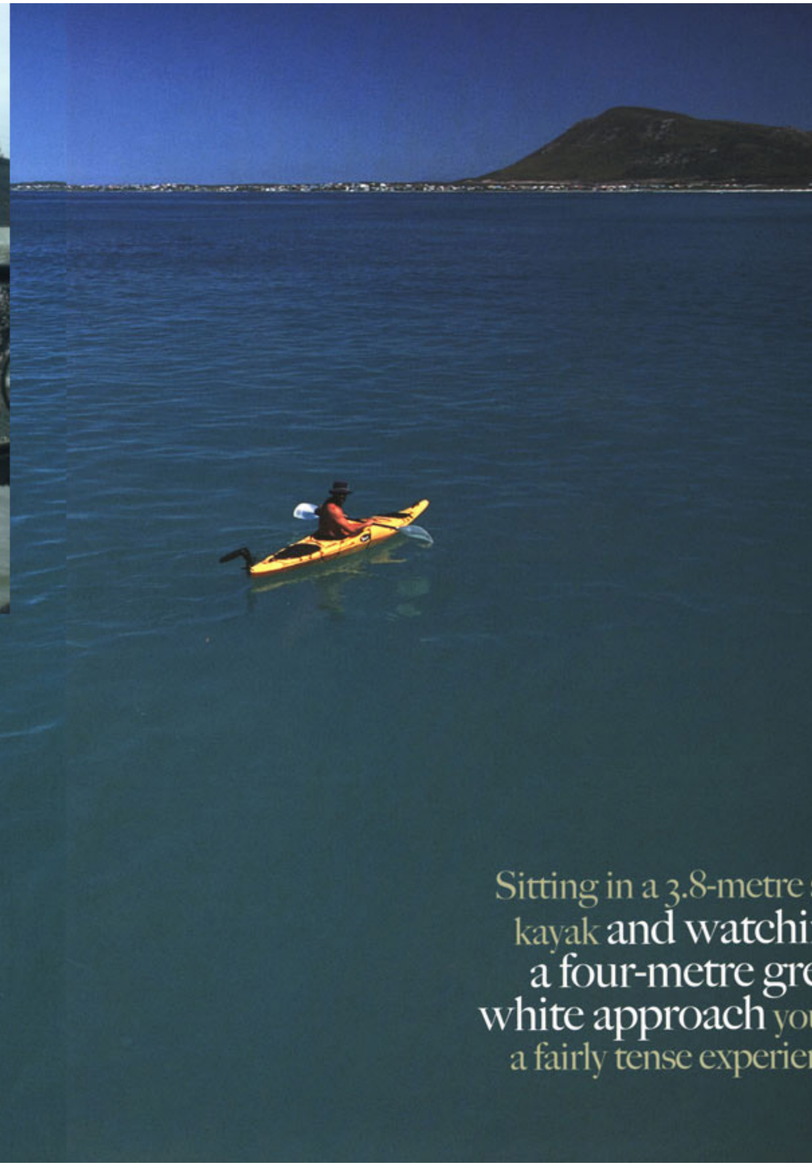


Money-Saving Store Coupons Inside!
TV GUIDE
Aug. 26-Sept. 1
75¢
Oprah! The Richest Woman on TV?
How she amassed her $250-million fortune
This is what you get when you put Oprah Winfrey's face...
...on Ann Margret's body.
CRACKED.COM

This is Patriarch Kirill I,
the leader of the
Russian Orthodox church...
...and this is his $30,000 watch...
...before it was edited out...
...kind of.
CRACKED.COM

MGM Lion





Sitting in a 3.8-metre
kayak and watchi
a four-metre gr
white approach yo
a fairly tense experie

Context++

- Digital Wizardry, creative Photoshop techniques, Amphoto books, 1998

More fakes

- More at https://www.quora.com/What-are-some-of-the-most-widely-circulated-fake-pictures
- https://www.cracked.com/pictofacts-41-24-famous-photos-you-wont-believe-were-fake/
- https://www.snopes.com/fact-check/category/photos/

Fake fake

Jack Cashill, author of the book *Deconstructing Obama* claimed to have discovered a photoshopped photo of President Obama and his grandparents sitting on a New York City bench...

Presenting this version of the "original picture" below as proof that the photo had been manipulated.

Well, one of them has... but it's the supposed "original". Anyone even slightly familiar with Photoshop will see the stone background to the right of this picture is one of the worst examples of "clone stutter" ever produced. Also, he forgot to Photoshop out Obama's knee, between the grandparents.

CRACKED.COM

Fake as an excuse

- https://www.cnn.com/2018/04/20/middleeast/iraq-parliament-candidate-withdraws/index.html?fbclid=IwAR30SzDby_Wjdz-he_bscMcxh2hidprEXuopQ71rz_qOlFNy7QnJTnRJXO4

Moon landing conspiracy theory (fake fake)

- https://en.wikipedia.org/wiki/Moon_landing_conspiracy_theories

Ethics of retouching in photojournalism

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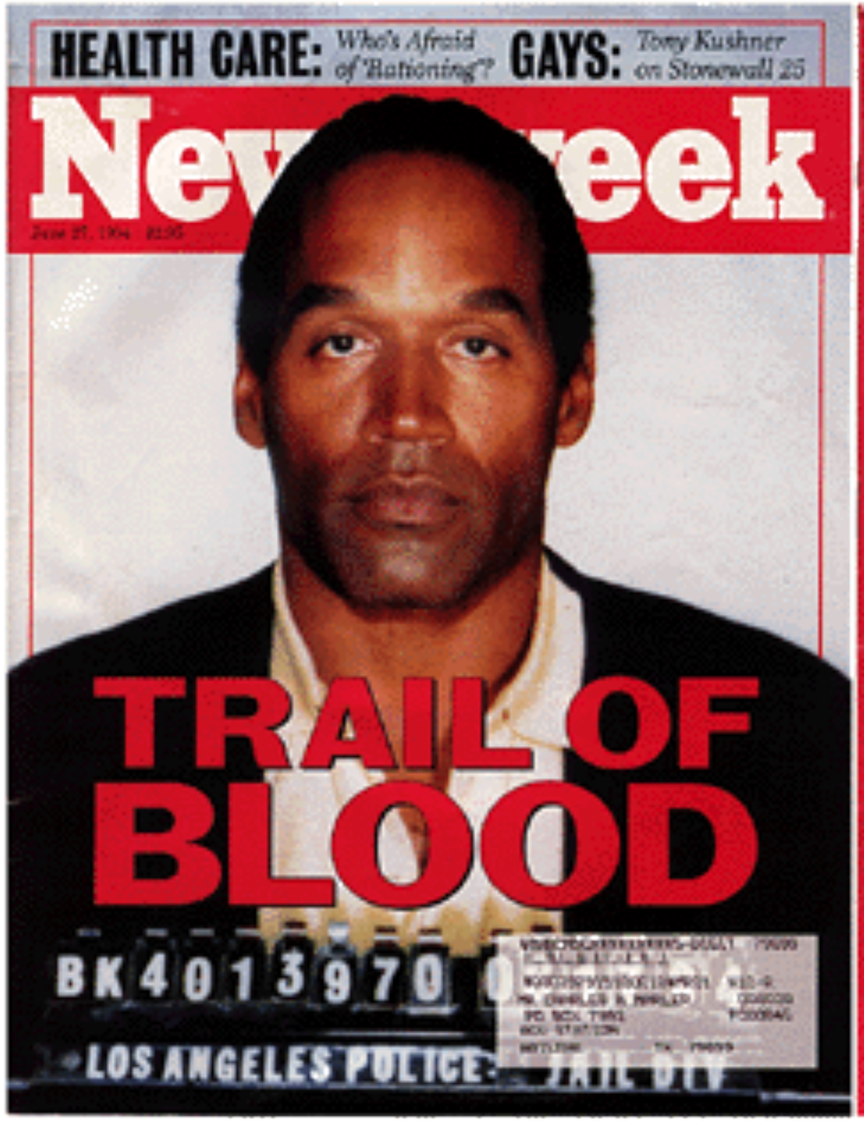
OJ


HEALTH CARE: Who's Afraid of 'Rationing'?
GAYS: Tony Kushner on Stonewall 25
TRAIL OF BLOOD
BK4013970
LOS ANGELES POLICE

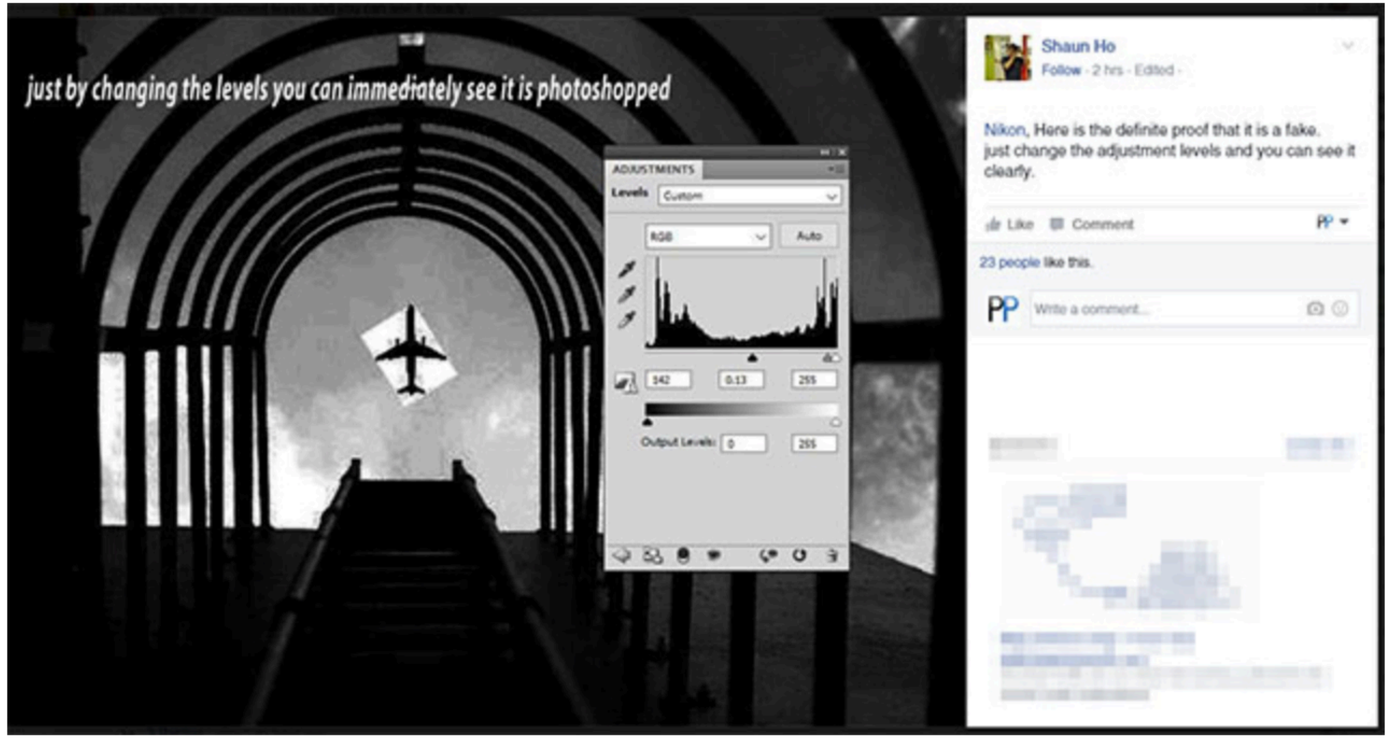
TIME
An American Tragedy
BK4013970 061794
LOS ANGELES POLI

Adnan Hajj photographs controversy

World Press Photo competition

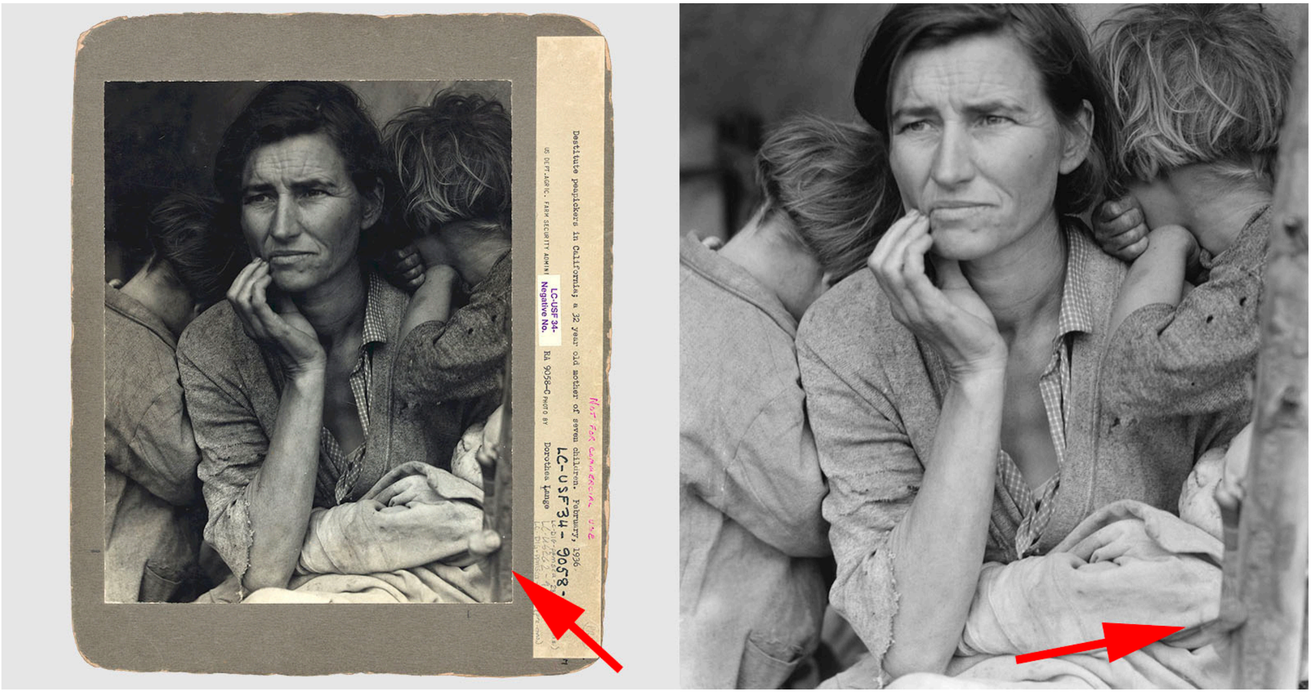
- 2015, 20 percent of finalists eliminated because too retouched (once compared two RAW files)
- https://lens.blogs.nytimes.com/2015/02/17/world-press-photo-manipulation-ethics-of-digital-photojournalism/
- e.g. tone mapping that renders some parts too dark, remove objects,
- But note that raw files could be manipulated too.
- https://www.worldpressphoto.org/programs/contests/photo-contest/verification-process/what-counts-as-manipulation/28615

- https://petapixel.com/2016/01/29/nikon-awards-prize-to-badly-shopped-photo-hilarity-ensues/



Dorothea Lange, Migrant mother

- https://petapixel.com/2018/11/30/that-iconic-migrant-mother-photo-was-photoshopped/



- More importantly it is staged. https://www.diyphotography.net/how-the-iconic-photo-migrant-mother-was-staged-and-captured/. https://www.popphoto.com/how-dorothea-lange-created-her-migrant-mother-photo#page-2

Steve McCurry

- http://time.com/4351725/steve-mccurry-not-photojournalist/
- https://www.digitalrev.com/article/eyes-of-the-afghan-girl-a-critical-take-on-the-steve-mccurry-scandal
- Caption: “Haunted eyes tell of an Afghan refugee’s fears”

Texture

- https://www.popphoto.com/american-photo/processing-news-retouching-photojournalism#page-2

- Claudio Palmisano, of 10b Photography, based in Rome, processed the images in this story for the journalists who shot them.

Texture

- https://www.popphoto.com/american-photo/processing-news-retouching-photojournalism#page-2

- Claudio Palmisano, of 10b Photography, based in Rome, processed the images in this story for the journalists who shot them.

Iwo Jima

- http://web.mit.edu/drb/Public/PhotoThesis/

- The confusion over the authenticity of the famous photograph resulted from Rosenthal's casual response to a correspondent back at Guam. The reporter congratulated Rosenthal on the image and then asked if it was posed. Thinking that the writer meant the third picture, Rosenthal admitted that it had been set-up.

- In decades previous, there would have been no ethical problem either way - had Rosenthal posed the picture or had he not, nobody would have protested. Technology, however, made it possible to capture images like Rosenthal's without interfering with the scene.

- https://en.wikipedia.org/wiki/Raising_the_Flag_on_Iwo_Jima

Selection, cropping

- https://www.moillusions.com/media-manipulation-illusion-example
- https://www.cbsnews.com/pictures/images-of-war-the-ground-war/8/
-

Brian Walski, LA Times Iraq photo

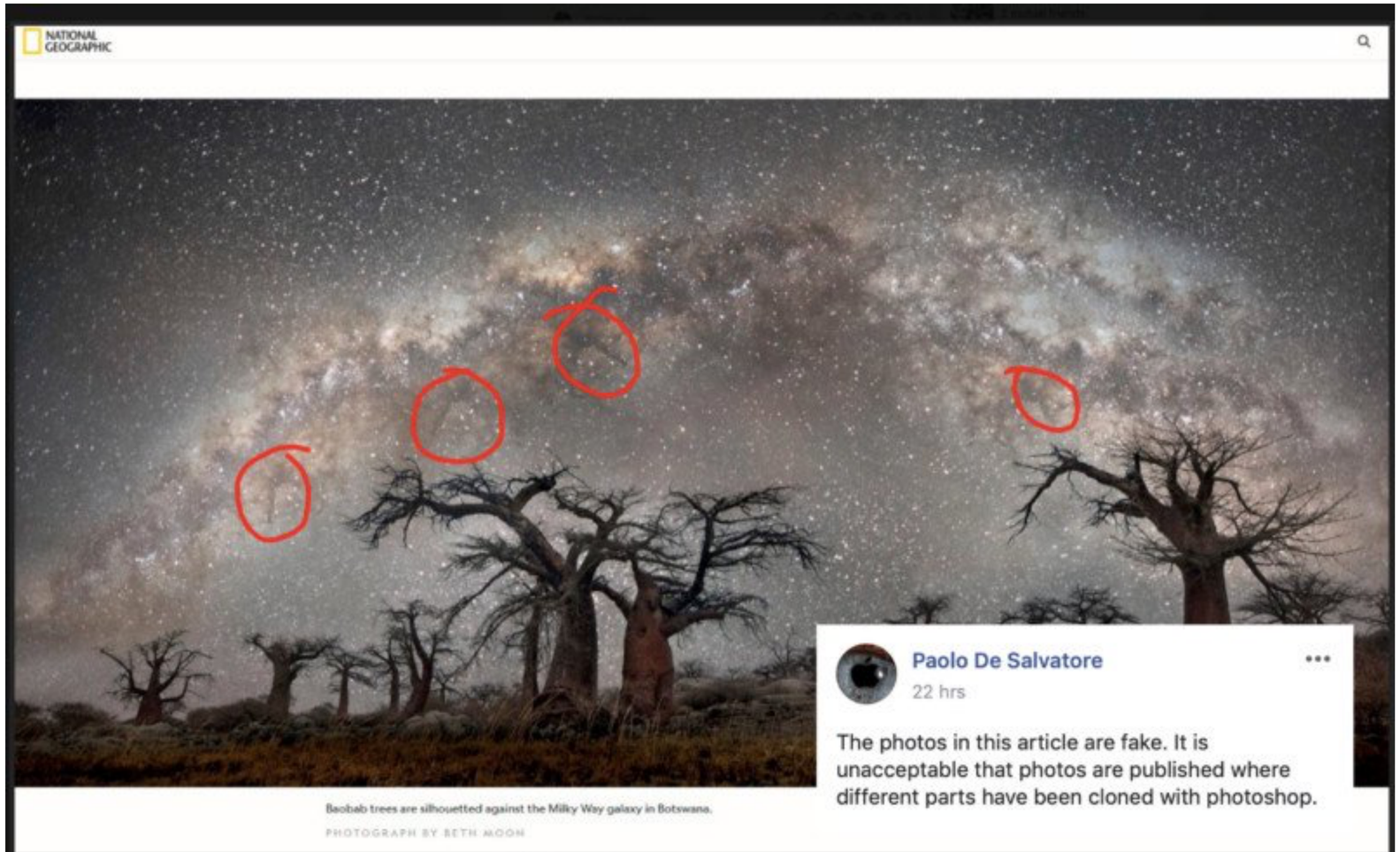
- http://www.alteredimagesbdc.org/walski

- The published photo is a composite of two images taken seconds apart. After the Hartford Courant published the image, a Courant employee noticed a duplication of civilians in the background. The Los Angeles Times confronted Walski, who confessed to having digitally merged the two photographs to improve the composition.

The Actual Photos

Context matters

- https://petapixel.com/2019/05/07/this-milky-way-photo-on-nat-geo-is-raising-eyebrows/



Family trip to DC and selective editing

Family trip to DC and selective editing

What is OK?

- Selective shooting/editing?
- Cropping?
- Tone mapping?
- Color manipulation?
- Cloning?
- Filtering (e.g. bilateral filter)?
- Denoising (e.g. bilateral filter)?

Retouching is far from the only issue

- In many cases, photos are real but the caption is misleading
- What is the boundary between making a funny meme and misleading people?

Fake captions

- Claim: Ronald Reagan met with the Taliban in 1985 and compared them to the founding fathers of the United States.

False, Mujahideen

Fake caption

- Does this photo show Houston after severe rains in 2015?

- No. While this photograph does show flood waters in Houston, the above-displayed image was taken in 2001.

- https://www.snopes.com/fact-check/houston-flood-photo/

Is This a Photograph of the ‘Organizer’ of the Immigrant Caravan?

- https://www.snopes.com/fact-check/caravan-organizer-photo/

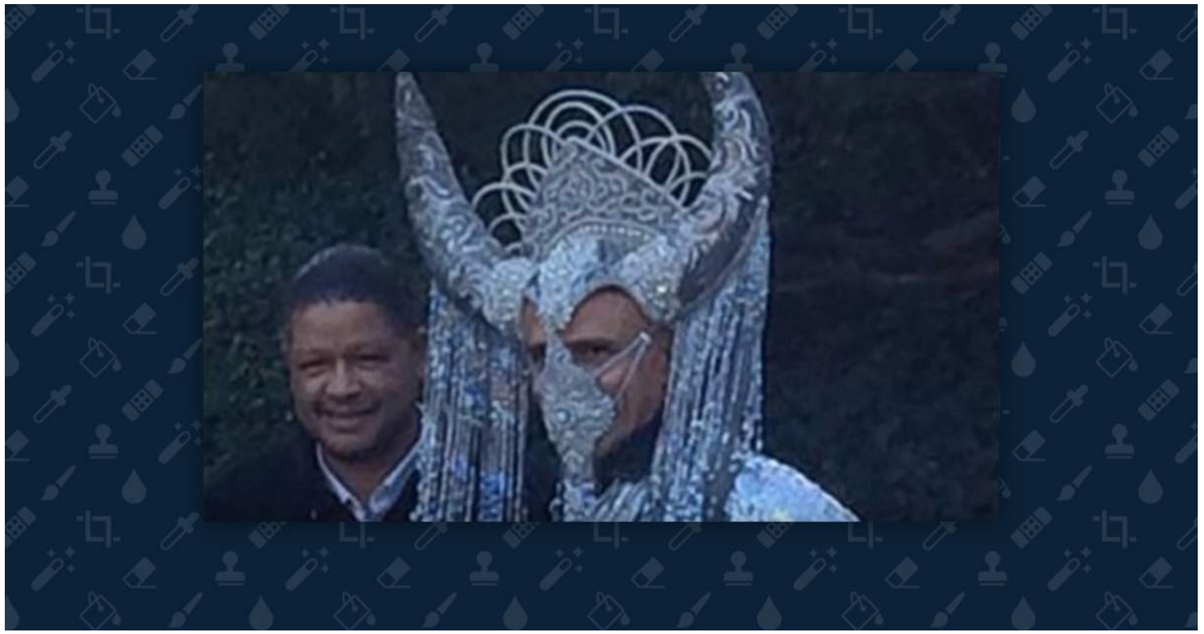
- In reality, the man in the photograph was Rubén Albarrán, lead singer of the popular Mexican band Café Tacvba. The photograph was likely taken during a visit Albarran and bandmate Emmanuel del Real made to caravan members during their stop in Mexico City.

-

Does This Photograph Show Barack Obama Dressed as Satan?

- https://www.snopes.com/fact-check/barack-obama-illuminati-photo/

- The head piece in this photograph, which was created by Miss G Designs and the pictured costume were both worn to a Burning Man Festival in 2015 by New York Real Estate agent Michel Madie. We've found several other images of Madie in this headdress and costume via Ben Henretig, Scott London, and Facebook:



News & fake news: a hierarchy of problems

- Retouched photo
- Fake caption
- Selective choice of photos to take, publish
- Choice of topics to cover and emphasize

My provoking take: Abuses are surprisingly not so frequent (wrt truth)

- Why is it that we don’t see more nefarious use of photo manipulation?
  - Social norms?
  - Fear of getting caught?
  - Not even needed?
- See also https://www.theverge.com/2019/3/5/18251736/deepfake-propaganda-misinformation-troll-video-hoax
- https://www.conspicuouscognition.com/

Dan Williams on dis/misinformation

- https://www.conspicuouscognition.com/

- https://www.conspicuouscognition.com/p/debunking-disinformation-myths-part
- https://www.conspicuouscognition.com/p/debunking-disinformation-myths-part-e14
- https://www.conspicuouscognition.com/p/debunking-disinformation-myths-part-c7f
- https://www.conspicuouscognition.com/p/how-dangerous-is-misinformation
- https://www.conspicuouscognition.com/p/misinformation-poses-a-smaller-threat
- https://www.conspicuouscognition.com/p/did-online-misinformation-fuel-the

Partnership in AI’s take

- https://www.partnershiponai.org/protecting-public-discourse-from-ai-generated-misdisinformation/

Norms, Guidelines

- https://arxiv.org/pdf/1308.5237.pdf?fbclid=IwAR22kE9H_zm4-mO_ZzjoIj9YJ-D2RVQ4gElUoYtEvtuBtF-gxzU6VjcELO4

- https://www.ap.org/about/news-values-and-principles/telling-the-story/visuals?fbclid=IwAR2Oe2ixgWz27LB5zw1GWQTXNzYEz5dnQYFMLWWB8iBWK9_Z4flTVB81M1M

- https://nppa.org/code-ethics (National Press Photographers Association)

AP Code of Ethics

- https://www.csus.edu/indiv/g/goffs/135%20photojournalism/associated%20press%20ethics%20code.pdf
- AP pictures must always tell the truth. We do not alter or digitally manipulate the content of a photograph in any way.
- The content of a photograph must not be altered in Photoshop or by any other means. No element should be digitally added to or subtracted from any photograph. The faces or identities of individuals must not be obscured by Photoshop or any other editing tool. Only retouching or the use of the cloning tool to eliminate dust on camera sensors and scratches on scanned negatives or scanned prints are acceptable.
- Minor adjustments in Photoshop are acceptable. These include cropping, dodging and burning, conversion into grayscale, and normal toning and color adjustments that should be limited to those minimally necessary for clear and accurate reproduction (analogous to the burning and dodging previously used in darkroom processing of images) and that restore the authentic nature of the photograph. Changes in density, contrast, color and saturation levels that substantially alter the original scene are not acceptable. Backgrounds should not be digitally blurred or eliminated by burning down or by aggressive toning. The removal of “red eye” from photographs is not permissible.
- When an employee has questions about the use of such methods or the AP’s requirements and limitations on photo editing, he or she should contact a senior photo editor prior to the transmission of any image.
- On those occasions when we transmit images that have been provided and altered by a source — the faces obscured, for example — the caption must clearly explain it. Transmitting such images must be approved by a senior photo editor.
- Except as described herein, we do not stage, pose or re-enact events. When we shoot video, environmental portraits, or photograph subjects in a studio care should be taken to avoid, misleading viewers to believe that the moment was spontaneously captured in the course of gathering the news. In the cases of portraits, fashion or home design illustrations, any intervention should be revealed in the caption and special instructions box so it can¹t be mistaken as an attempt to deceive.

National Press Photographers Association

- Be accurate and comprehensive in the representation of subjects.
- Resist being manipulated by staged photo opportunities.
- Be complete and provide context when photographing or recording subjects. Avoid stereotyping individuals and groups. Recognize and work to avoid presenting one's own biases in the work.
- Treat all subjects with respect and dignity. Give special consideration to vulnerable subjects and compassion to victims of crime or tragedy. Intrude on private moments of grief only when the public has an overriding and justifiable need to see.
- While photographing subjects do not intentionally contribute to, alter, or seek to alter or influence events.
- Editing should maintain the integrity of the photographic images' content and context. Do not manipulate images or add or alter sound in any way that can mislead viewers or misrepresent subjects.
- Do not pay sources or subjects or reward them materially for information or participation.
- Do not accept gifts, favors, or compensation from those who might seek to influence coverage.
- Do not intentionally sabotage the efforts of other journalists.
- Do not engage in harassing behavior of colleagues, subordinates or subjects and maintain the highest standards of behavior in all professional interactions.

National Geographics https://yourshot.nationalgeographic.com/photo-guidelines/

- Caption
  - We insist on truth in captioning and expect full disclosure in the story behind the photo. The description should be complete and accurate. Not only does this establish trust and lend greater credibility to your photo, but it also increases the engagement of the viewer.
- Burning And Dodging
  - Brightening or darkening specific areas in an image is allowed but should be kept to a minimum and not done to the point where it is obvious. Your goal in using digital darkroom techniques should only be to adjust the dynamic tonal range and color balance of an image so that it more closely resembles what you saw and communicates the mood of the scene.
- Cropping
  - Cropping is allowed, but composing the image in-camera is always ideal.
- Cloning
  - Cloning is not allowed. Cloning is the process of adding to or subtracting elements from a photograph. An example would be removing a pole from behind a person's head in a portrait, adding people to a crowd, or mirroring repetitive objects.
- Drones
  - Photographs taken with drones have to be in full compliance with state and federal laws, including specifically aviation laws.
- Black And White Photography
  - Converting your color photos to black and white is acceptable.
- Stitched Panoramas
  - These are allowed only if the segments were all made within the same time frame. Don't create panoramas with sections made at significantly different times. Do not change focal length while creating a stitched image. Do not stretch the meaning of panorama to include elements that weren't in the scene as you saw it. If your photo is a stitched or stacked image, please indicate so in the caption.
- Composite
  - Composites are allowed on Your Shot. To be eligible for publication in National Geographic magazine, the images must be combined parts made at the same time. Don't submit final images where the foreground was shot at noon and the sky at sunset. We the editors do encourage creativity with your photography, as certain select assignments may allow images that are composites taken from different times. Please review what the editor of an assignment will allow or not allow to be submitted. You can read our blog post that goes into more detail on the subject.
- High Dynamic Range (Hdr)
  - These images are allowed on Your Shot. If your photo is an HDR image, please indicate this in the caption.
- Filters
  - We allow filters, including presets, on photographs. We ask that you please include a description of how the style was achieved and which filter or technique was used. Use discretion, however, as over-processed images are not ones that could make it into print publication.
- Raw Files
  - To be eligible for print publication photographers must have a RAW file on hand to be turned over to our editors.
- Watermarks
  - Your Shot always credits the creator of a photo whenever and wherever it appears on the National Geographic site, along with providing a link to their Your Shot profile. Because of this, there's no need to watermark your photo. A small and subtle watermark is allowed but not encouraged—we want to see your photograph without any distractions.
- Inappropiate Content
  - Any content that violates the National Geographic Terms of Service will be removed from the site. This includes inappropriate, pornographic or offensive, or otherwise objectionable content, hate speech, and copyright violations. Your assistance in notifying us of photos or profiles that may violate the Terms of Service is appreciated.

World press photo

- https://www.worldpressphoto.org/programs/contests/photo-contest/verification-process/what-counts-as-manipulation/28615
- 1. The first thing that counts as manipulation is staging or re-enacting events.
- 2. The second thing that counts as manipulation is adding or removing content from the image.
  - It is important to note that processing by itself is not manipulation. Because of this, entry rule 11 states “adjustments of color or conversion to grayscale that do not alter content are permitted.”
  - There are two types of color adjustment that count as manipulation:
  - Changes in color may not result in significant changes in hue, to such an extent that the processed colors diverge from the original colors.
  - Changes in density, contrast, color and/or saturation levels that significantly alter content by obscuring or eliminating elements in the picture are not permitted. The jury determines which changes are significant, following the video guidance (below) on what counts as manipulation.
  - Altering the content of a picture by “adding, rearranging, reversing, distorting or removing people and/or objects from within the frame” is manipulation and makes an entry ineligible for the final round.
  - It is not acceptable to remove things such as:
  - physical marks on body
  - small objects in the picture
  - reflected light spots
  - shadows
  - extraneous items on picture’s border that could not be removed by crop
  - It is not acceptable to add things. This includes, but is not limited, to:
  - cloning in highlights, enhancing body, or costume size
  - painting in object details
  - photo montage
  - replicating material on the border of a picture to make a neat crop possible.

- http://photo-journalisme.org/en/ethics/

Original image

What you shouldn't do

Do not add, remove, rearrange or flip things or people in the image.

- http://photo-journalisme.org/en/ethics/

Original image

What you shouldn't do

Do not modify colors.

- http://photo-journalisme.org/en/ethics/

Original image

What you shouldn't do

Do not crop a picture by deleting elements.

- http://photo-journalisme.org/en/ethics/

Original image

What you shouldn't do

Do not heighten the density, contrast or saturation for the purpose of removing elements or people, or over-dramatize a situation.

seventeen magazine's BODY PEACE TREATY

We vow to...

- Help make your life amazing! You have ***big dreams*** and we want you to achieve every single one of them!
- Never change girls' body or face shapes. (Never have, never will.)
- Celebrate ***every kind of beauty*** in our pages. Without a range of body types, skin tones, heights, and hair textures, the magazine—and the world—would be boring!
- Always feature real girls and models who are healthy. Regardless of clothing size, being healthy is about honoring your natural shape.
- Be totally up-front about what goes into our photo shoots. You can go ***behind the scenes*** on our Tumblr (***seventeen.tumblr.com***) and see the whole shebang!
- Help you make the ***best choices*** for your body—food that fuels you, exercise that energizes you—so you can feel your absolute best each day.
- Give you the confidence to walk into any room and ***own it.*** Say bye-bye to those nagging insecurities that you're not good enough or pretty enough—they're holding you back from being awesome in the world!
- ***Listen carefully to you.*** If something in the magazine confuses you or makes you feel bad, we want hear about it. You can e-mail us anytime at ***mail@seventeen.com*** or reach out to me directly at ***ann@seventeen.com***.

XOXO
-A.

what really changes!

Here's a peek at the minor tweaks we made to a fashion picture of Magdalena, 21. A few messy details—cleaned up. Her gorgeous smile—totally authentic!

ANN: PERRY HAGOPIAN. FASHION: STEPHANIE MCNIEL.

@ANNSHOKET Tweet me anytime!

Recap: Fredo's take

- As far as I can tell, photojournalism has reacted well to the wide availability of digital retouching tools.

- The community, professional associations, news outlets and educational institutions have published detailed ethical standards

- Issues upstreams of retouching are more important (incorrect captions, which photos to take, which photos to select, which viewpoint to show, which topic to cover)

Science

Fredo Durand
MIT EECS & CSAIL

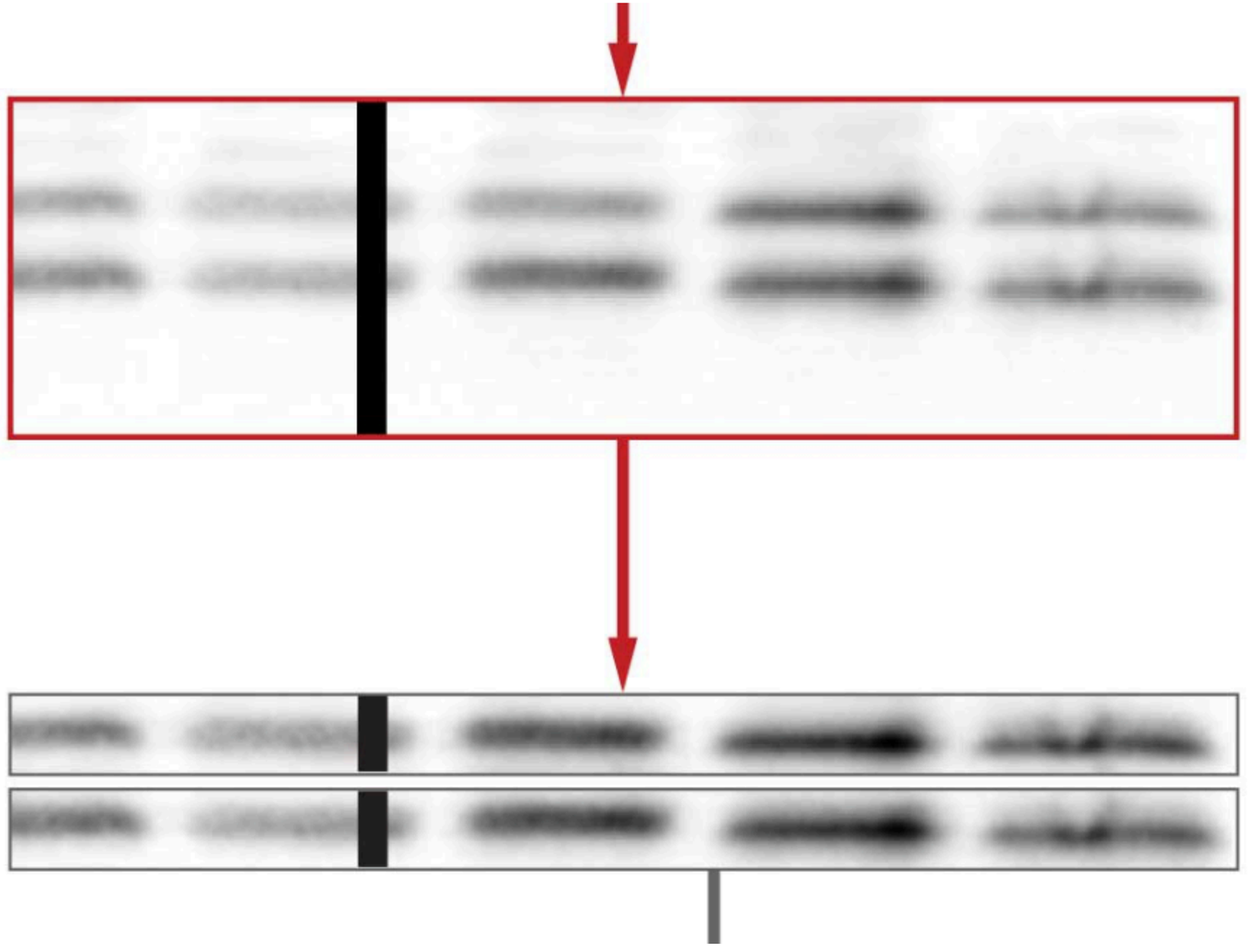
Surprising amount of Photoshop fraud in scientific journals

- https://www.science.org/content/article/potential-fabrication-research-images-threatens-key-theory-alzheimers-disease

- **Image in question**
  Ashe uploaded this Western blot to PubPeer after Schrag said the version published in *Nature* showed cut marks suggesting improper tampering with bands portraying Aβ*56 and other proteins (black boxes added by Ashe). The figure shows levels of Aβ*56 (dashed red box) increasing in older mice as symptoms emerge. But Schrag's analysis suggests this version of the image contains improperly duplicated bands.

1 Spot the similarities
Some bands looked abnormally similar, an apparent manipulation that in some cases (not shown) could have made Aβ*56 appear more abundant than it was. One striking example (red box) ostensibly shows proteins said to emerge later in the life span than Aβ*56.

2 Match contrast
Schrag matched the contrast level in the two sets of bands for an apples-to-apples comparison.



Video retouching and deep fakes

Fredo Durand
MIT EECS & CSAIL

Video is harder to manipulate, still possible though

Fake dragon air landing

- https://www.snopes.com/fact-check/dragonair-737-typhoon/
- https://www.youtube.com/watch?v=fYCQ87kGUP0
- created by “MeniThings,” a production company which specializes in CGI

Deep fake: deep learning for face replacement

- Big game changer because replacing someone's face in a video can now be done by anyone with no manual work
  - https://goberoi.com/exploring-deepfakes-20c9947c22d9
  - https://www.economist.com/science-and-technology/2017/07/01/fake-news-you-aint-seen-nothing-yet
  - https://github.com/deepfakes/faceswap
  - https://www.dailymail.co.uk/sciencetech/article-5492713/Experts-warn-deepfakes-videos-politicians-manipulated.html
  - https://www.cnn.com/2019/04/26/tech/ai-deepfake-detection-2020/index.html?

Peele Obama

- https://www.youtube.com/watch?v=cQ54GDm1eL0
-

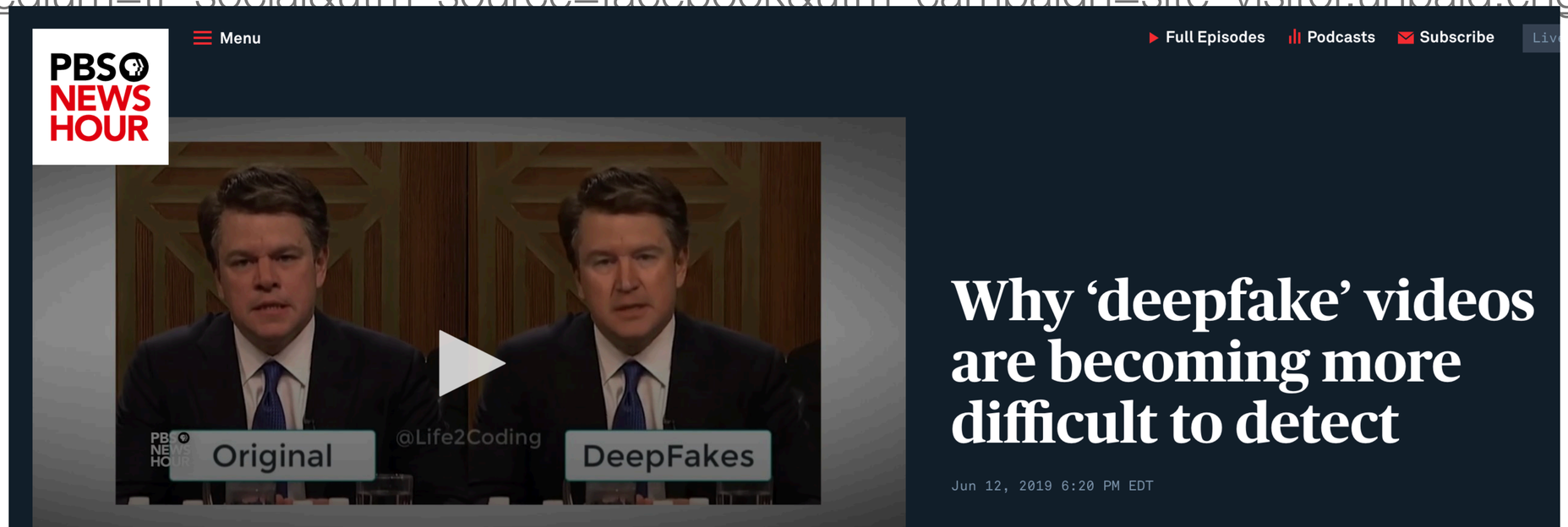
Also https://www.youtube.com/watch?v=DIZf7eRlD4w

Threat to democracy?

- https://www.rollingstone.com/culture/culture-features/face-swapping-porn-how-a-creepy-internet-trend-could-threaten-democracy-629275/

- https://www.pbs.org/newshour/show/why-deepfake-videos-are-becoming-more-difficult-to-detect

- https://www.technologyreview.com/s/612357/deepfake-busting-apps-can-spot-even-a-single-pixel-out-of-place/?utm_medium=tr_social&utm_source=facebook&utm_campaign=site_visitor.unpaid.engagement



- https://www.youtube.com/watch?time_continue=25&v=bPhUhypV27w&feature=emb_logo

- https://www.nbcnews.com/tech/tech-news/viral-schwarzenegger-deepfake-isn-t-just-entertaining-it-s-warning-n1016851

Deepfake Roundtable: Cruise, Downey Jr., Lucas & More

- https://www.youtube.com/watch?v=I_6Tumd8EQI

- https://www.youtube.com/watch?v=5rPKeUXjEvE

Harrison Ford in Solo movie?

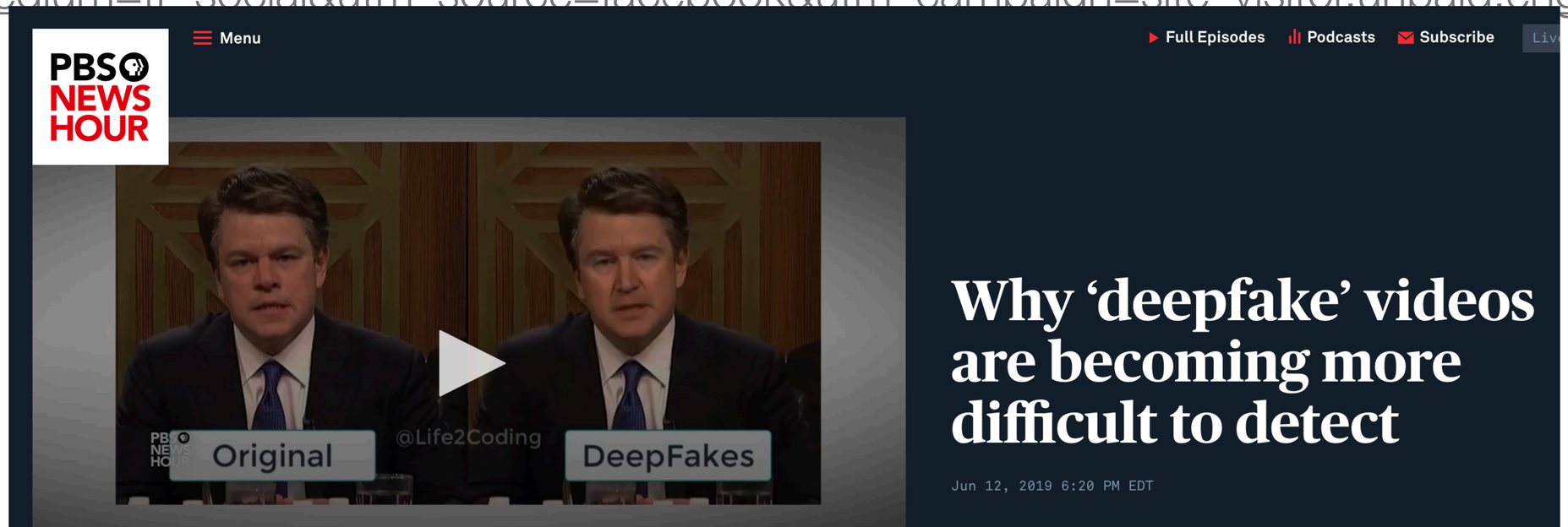
- https://www.youtube.com/watch?v=ANXucrz7Hjs

Threat to democracy?

- https://www.rollingstone.com/culture/culture-features/face-swapping-porn-how-a-creepy-internet-trend-could-threaten-democracy-629275/

- https://www.pbs.org/newshour/show/why-deepfake-videos-are-becoming-more-difficult-to-detect

- https://www.technologyreview.com/s/612357/deepfake-busting-apps-can-spot-even-a-single-pixel-out-of-place/?utm_medium=tr_social&utm_source=facebook&utm_campaign=site_visitor.unpaid.engagement



- https://www.motherjones.com/politics/2019/03/deepfake-gabon-ali-bongo/?fbclid=IwAR1d4b7YGKtryyYMX9twTEeYrBckEz3TF5b5rF-bp_fCgiBXULQvzojQg1o

The Bizarre and Terrifying Case of the "Deepfake" Video that Helped Bring an African Nation to the Brink

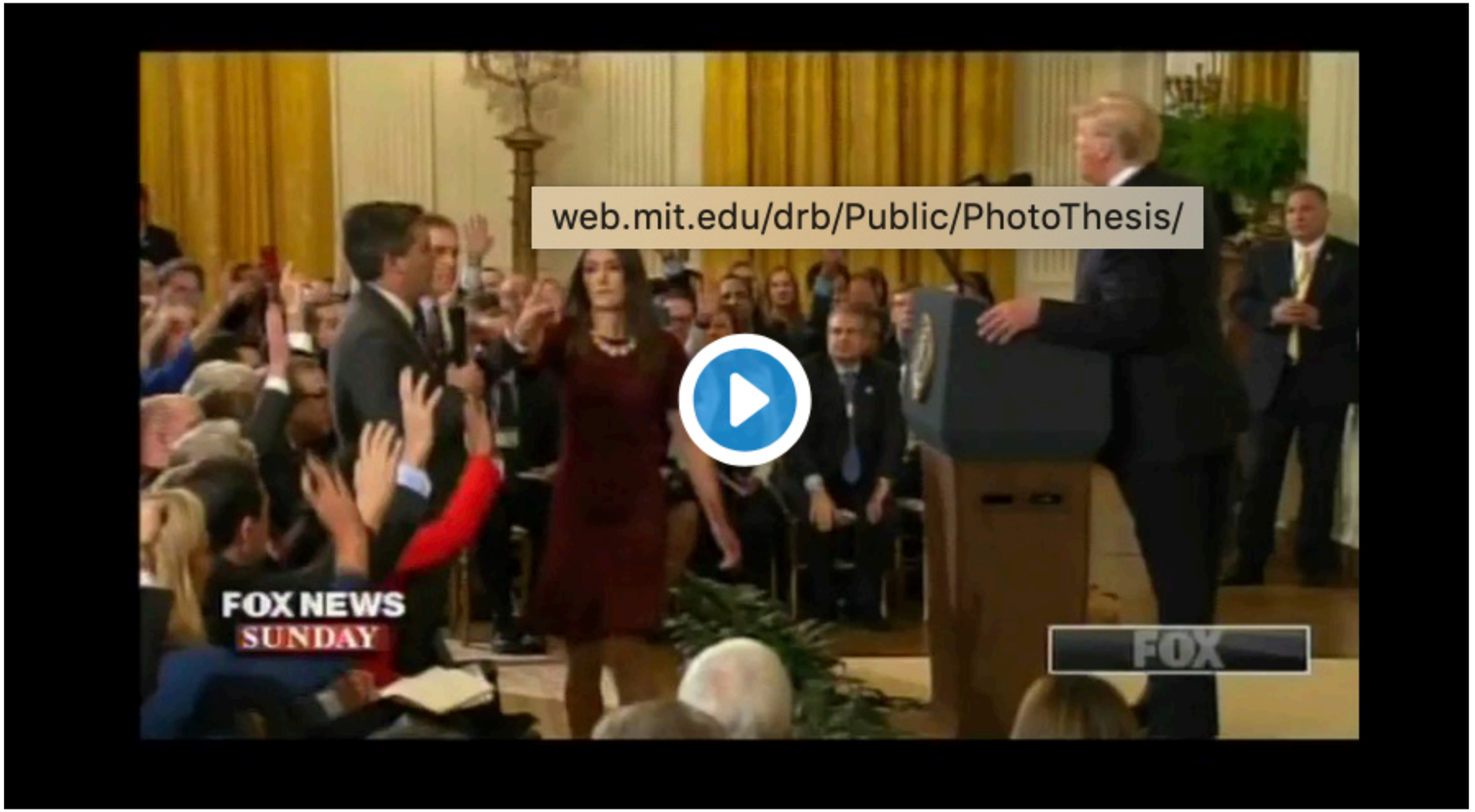
A controversial appearance by the president of Gabon portends a future where you can't believe your eyes.

ALI BRELAND
Reporter
Bio

Government of Gabon

Other video manipulation : Jim Acosta : timing edit

- White House reposted a doctored video (timing altered) to justify revoking CNN's Jim Acosta's credentials



Pelosi : time edit

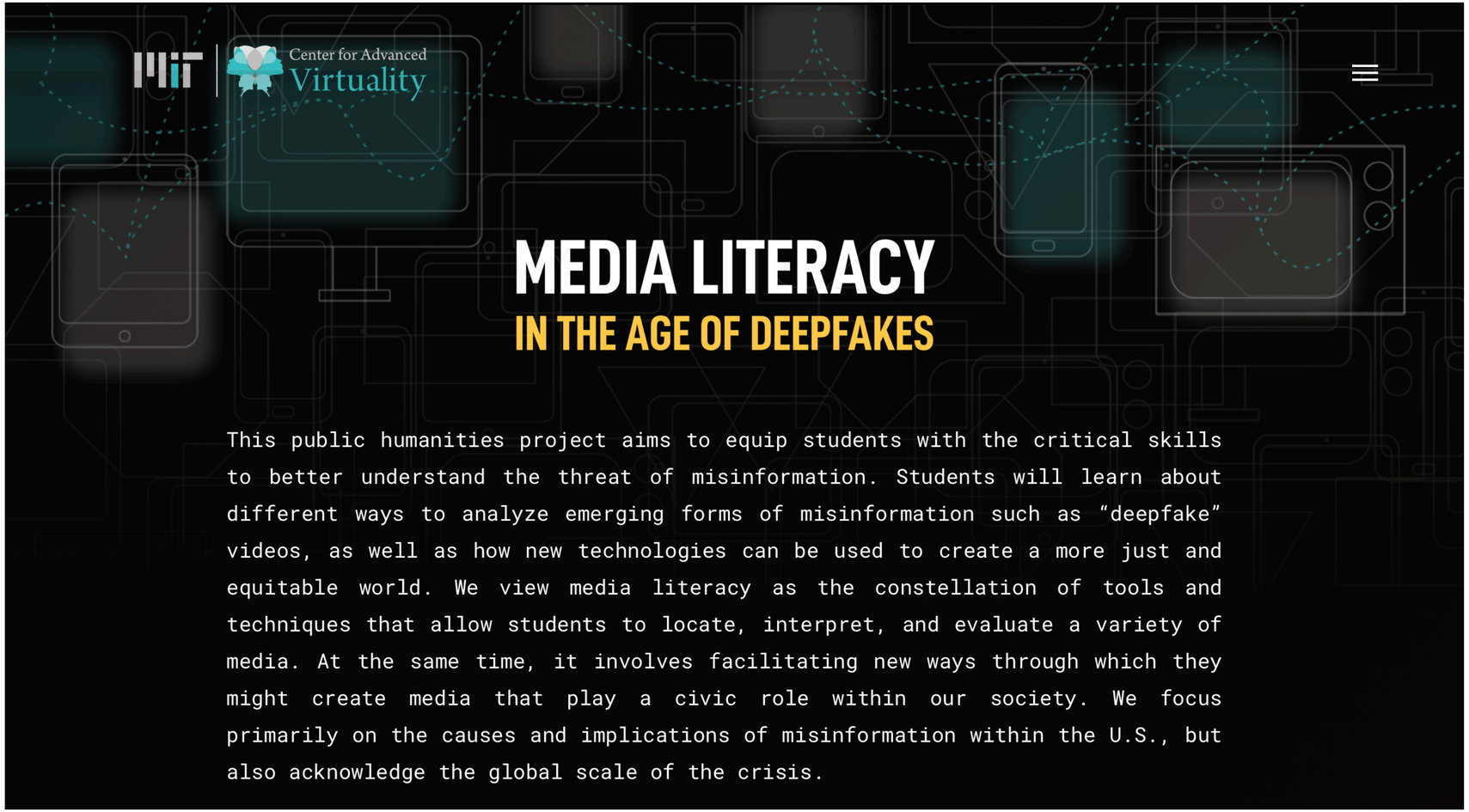
- https://www.nytimes.com/2019/05/24/us/politics/pelosi-doctored-video.html?action=click&module=Top%20Stories&pgtype=Homepage

More links

- https://www.marketplace.org/shows/make-me-smart-with-kai-and-molly/deep-thoughts-about-deepfakes/
- https://www.pbs.org/newshour/show/why-deepfake-videos-are-becoming-more-difficult-to-detect
- https://www.cnn.com/2019/04/26/tech/ai-deepfake-detection-2020/index.html?
- https://www.cnbc.com/2019/09/20/hao-li-perfectly-real-deepfakes-will-arrive-in-6-months-to-a-year.html
-

See Fox Harrell's class

- https://deepfakes.virtuality.mit.edu
-



Deep fake for (revenge) fake porn

Fredo Durand
MIT EECS & CSAIL

Deep fake for Fake porn

- Transfer faces of celebrities or regular people on porn videos
- Many women have spoken out about how distressing it was t find themselves portrayed in such a manner
- https://www.vice.com/en_us/article/vb55p8/i-paid-dollar30-to-create-a-deepfake-porn-of-myself
  - Illustrates how easy it is: all it took was 13 seconds of training video and $30 to transfer a face onto a porn video
- https://www.dailydot.com/unclick/deepfakes-ai-celebrity-porn/
- https://www.vice.com/en_us/article/gydydm/gal-gadot-fake-ai-porn
- https://www.vice.com/en_us/article/7x57v9/most-deepfakes-are-porn-harassment-not-fake-news
- https://www.theverge.com/2017/12/12/16766596/ai-fake-porn-celebrities-machine-learning

- https://www.washingtonpost.com/technology/2018/12/30/fake-porn-videos-are-being-weaponized-harass-humiliate-women-everybody-is-potential-target/
-

Deepfake revenge porn illegal in Virginia and California

- https://observer.com/2019/07/deepfakes-revenge-porn-illegal-virginia/
- https://www.cnet.com/news/california-laws-seek-to-crack-down-on-deepfakes-in-politics-and-porn/
- In my opinion Deepfakes porn creates a bigger need for legal tools. Photoshop and deep fakes haven't had much impact in politics and journalism because it's possible to fight back and expose the manipulation
- For a victim of fake porn, it's hard to fight back and exposing the fake does not help much

Deep fake & scams

Fredo Durand
MIT EECS & CSAIL

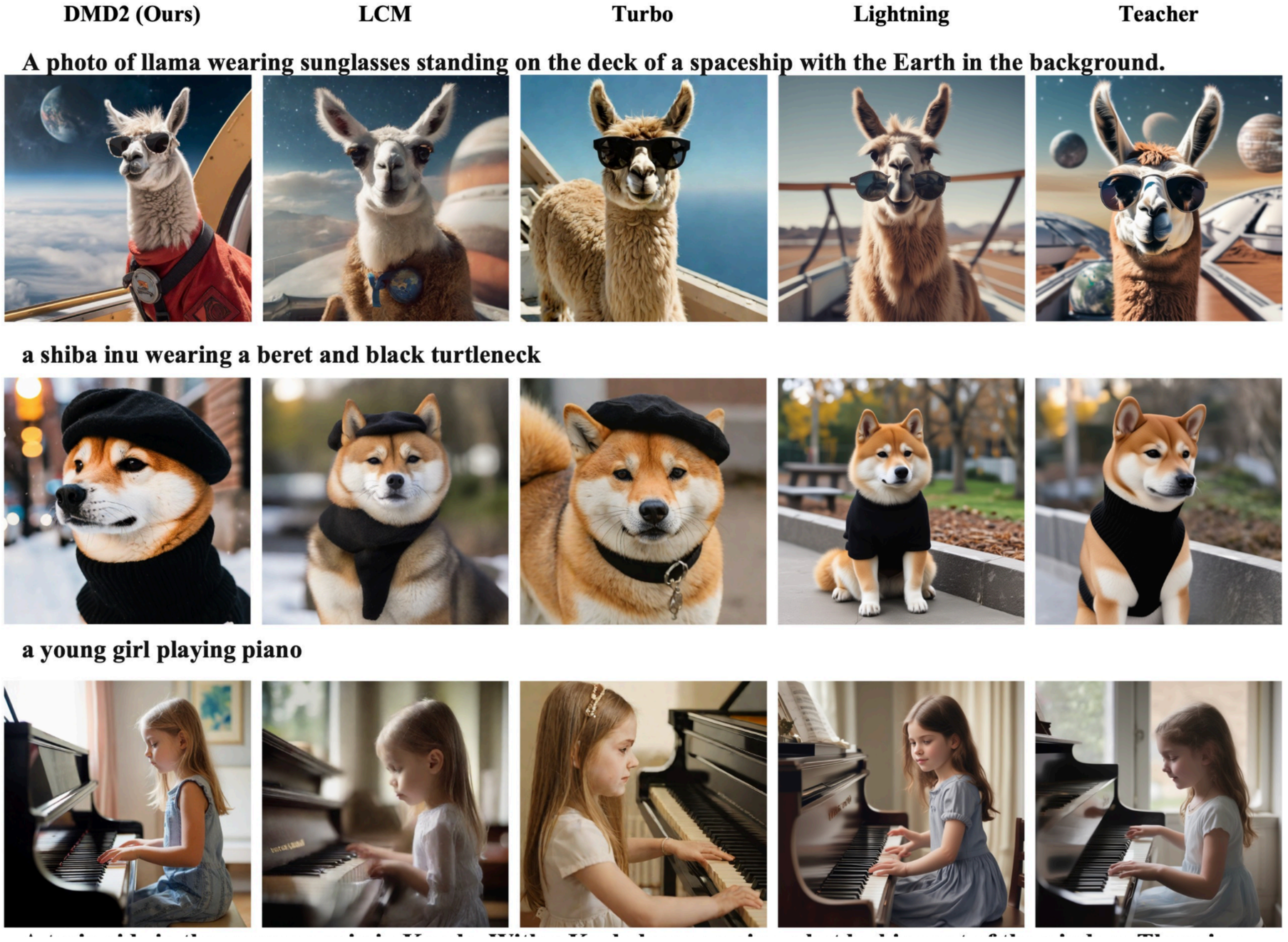
- https://arstechnica.com/ai/2024/10/deepfake-lovers-swindle-victims-out-of-46m-in-hong-kong-ai-scam/
- https://www.abc.net.au/news/health/2024-12-10/diabetes-supplements-deepfake-ads-targeting-health-professionals/104665824

Generative AI

Fredo Durand
MIT EECS & CSAIL

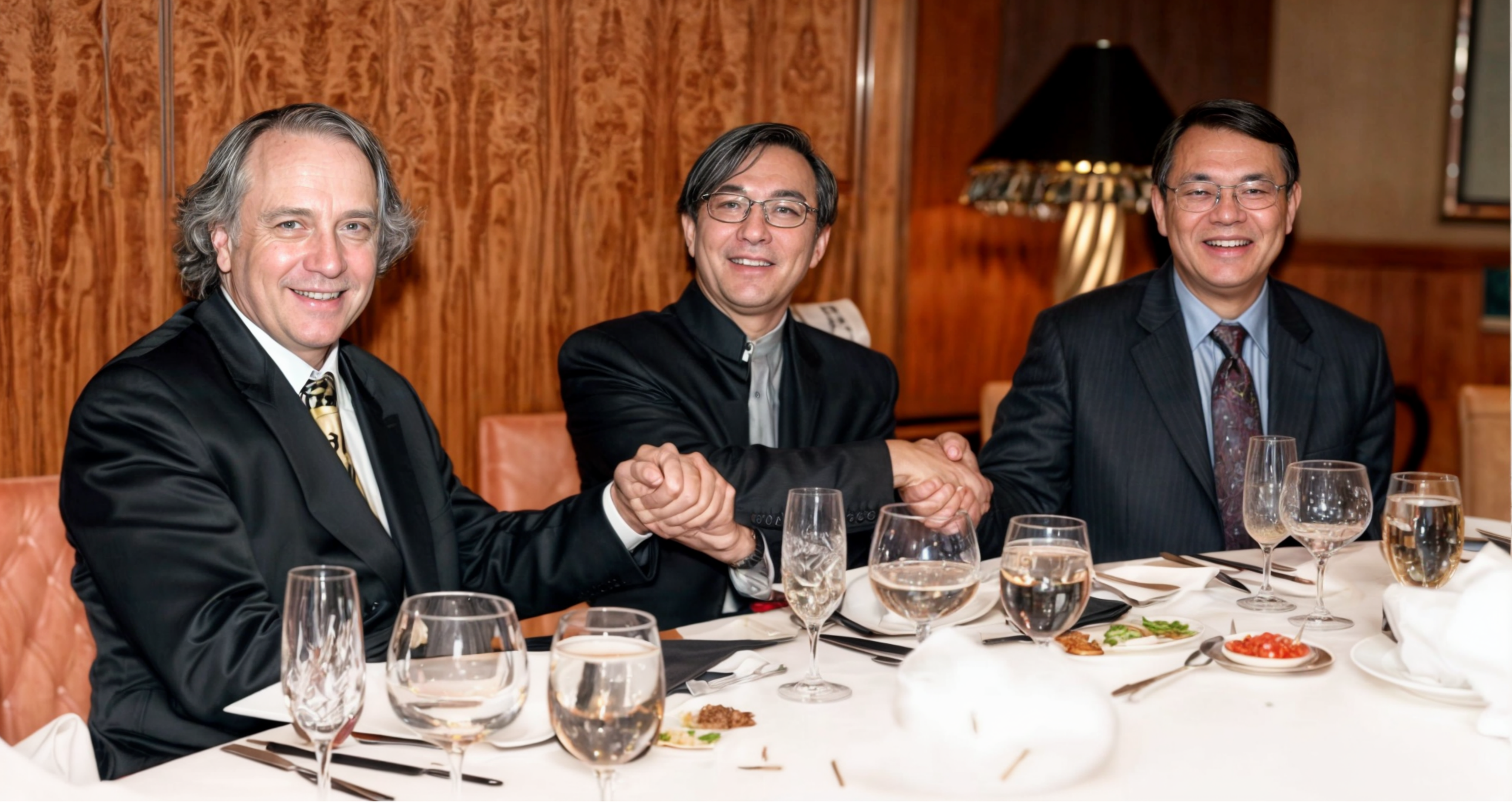
Generative AI

- Text to image

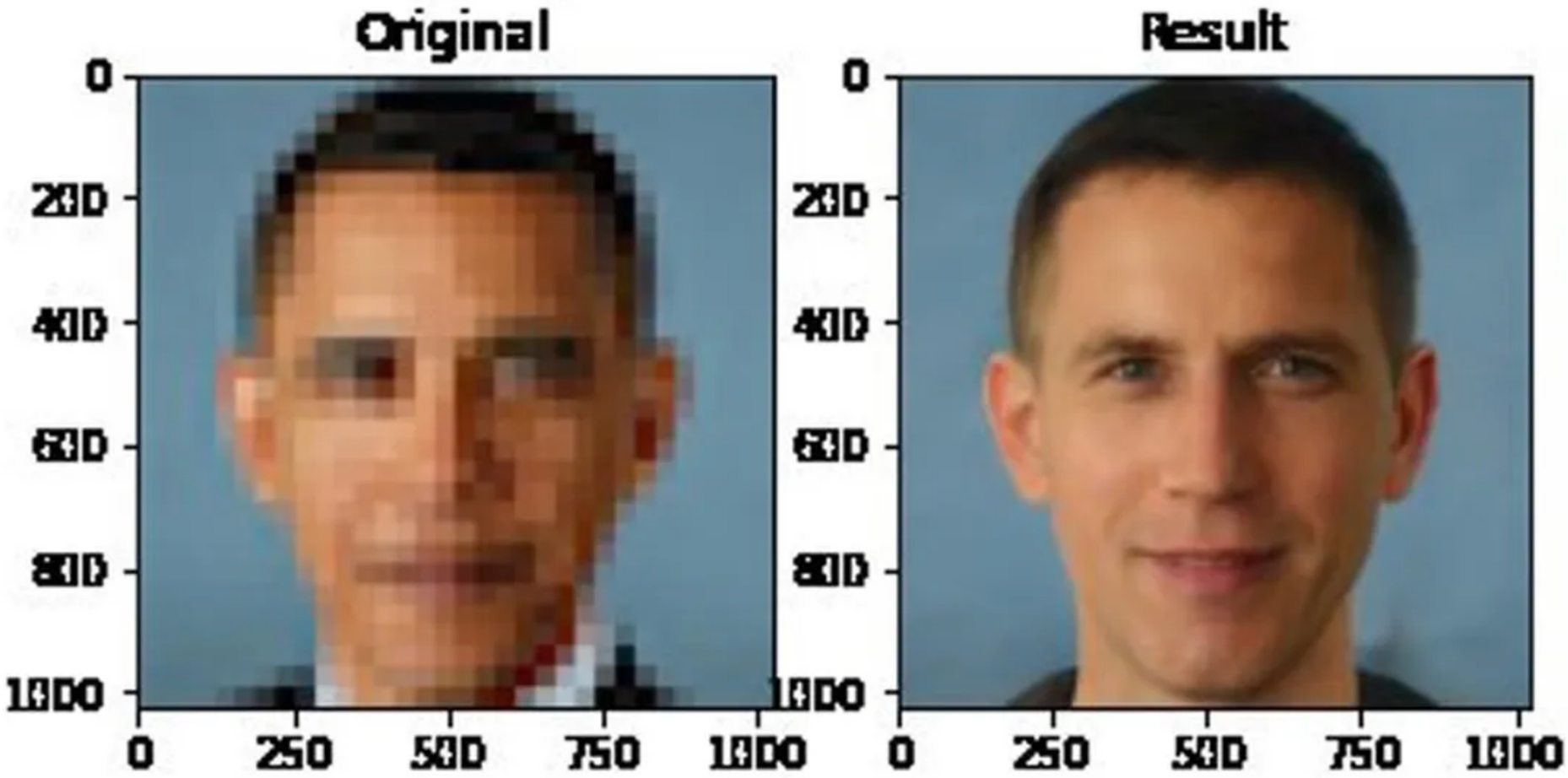


Generative AI for image retouching

- Superresolution
- Denoising
- Deblurring
- Inpainting
- Etc.



- http://pulse.cs.duke.edu/



Bias in ML

- https://mit-serc.pubpub.org/pub/potential-sources-of-harm-throughout-the-machine-learning-life-cycle/release/2

- Understanding Potential Sources of Harm throughout the Machine Learning Life Cycle

- As machine learning (ML) increasingly affects people and society, awareness of its potential unwanted consequences has also grown. To anticipate, prevent, and mitigate undesirable downstream consequences, it is critical that we understand when and how harm might be introduced...

- by Harini Suresh and John Guttag

Generative outpainting

- https://x.com/elizlaraki/status/1846252781851890026
-

Generative outpainting

- https://x.com/elizlaraki/status/1846252781851890026
-

Original Version used for conference

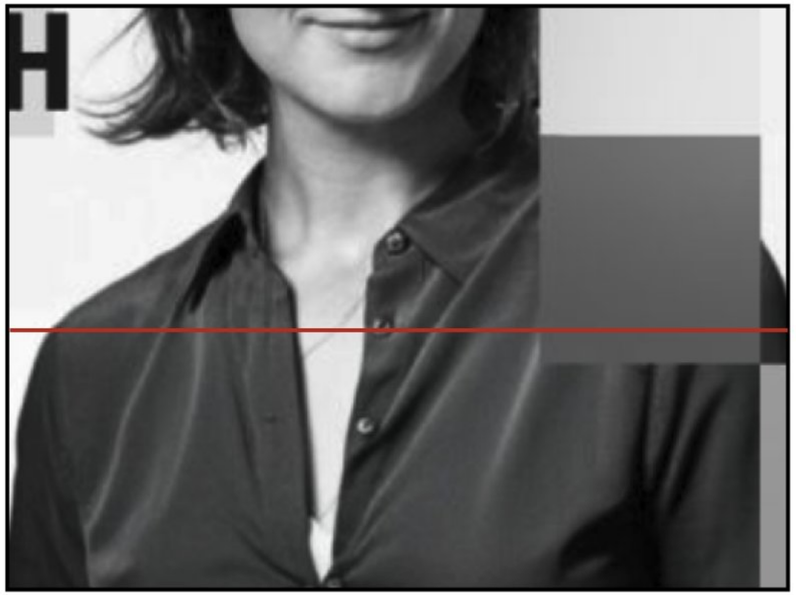
Generative outpainting

- https://x.com/elizlaraki/status/1846252781851890026
-

Original photo

Square cropped photo

Image cut off at second button



Gen-AI filled photo

Lower part of image generated from second button down

Now easier than ever

- But actual impact still unclear
- https://www.normaltech.ai/p/we-looked-at-78-election-deepfakes
-

Beauty, photography, and retouching

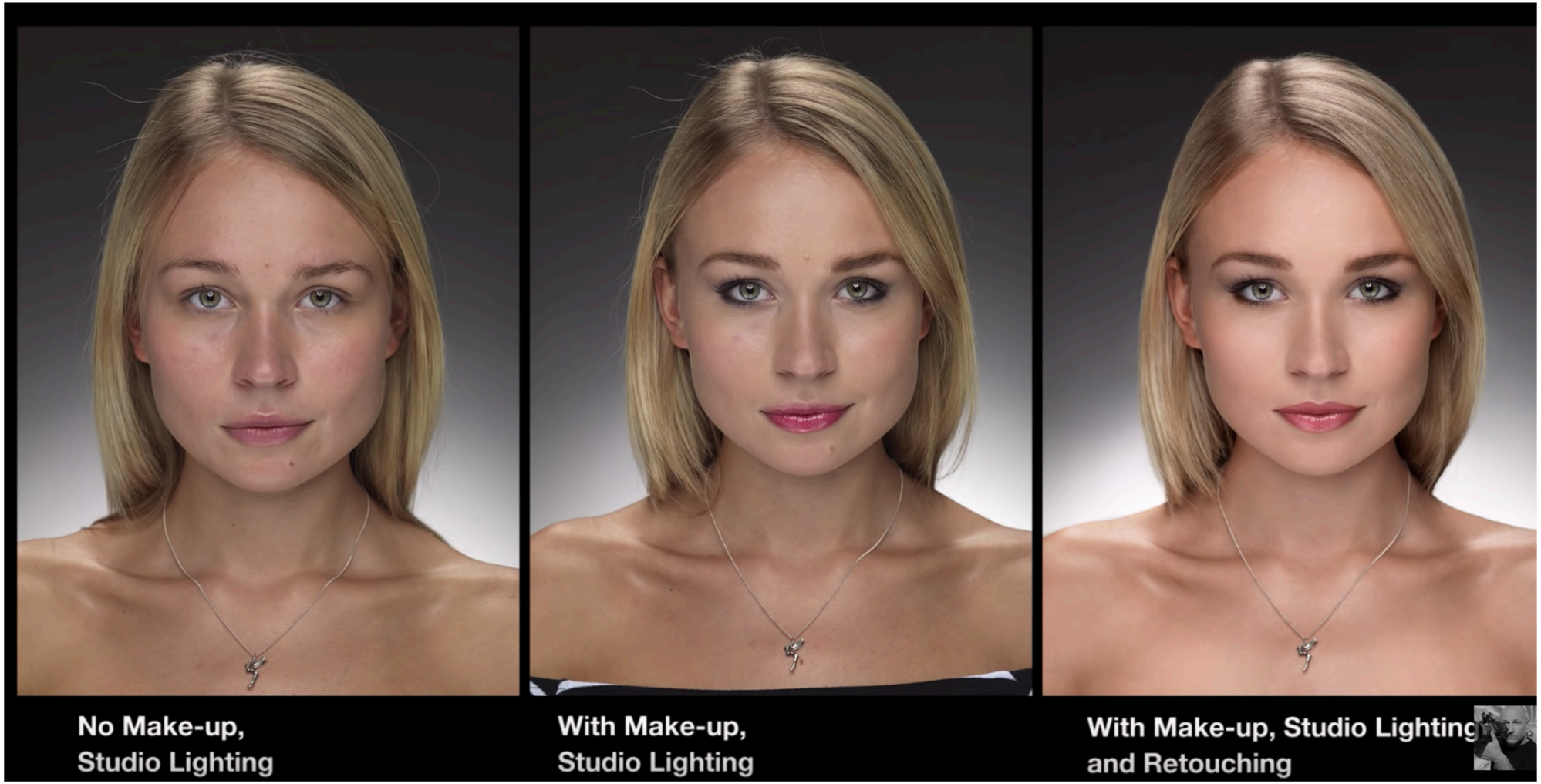
Fredo Durand
MIT EECS & CSAIL
See also https://en.wikipedia.org/wiki/Photo_manipulation?fbclid=IwAR08aJPk9mVXY3P8a_ADX_4jVwsvCUC_C2sum4-SL4n5tWU_nADUuzFskKw

Dove

- https://www.youtube.com/watch?v=iYhCn0jf46U&fbclid=IwAR3baUR0oxl0YdsCn82lNog_tUhUKCrSS9yYKXZJtSnBMh1FGu2-l3bJNds
-

- https://www.youtube.com/watch?time_continue=16&v=xKQdwjGiF-s

- https://www.youtube.com/watch?v=318iFsOOWr8

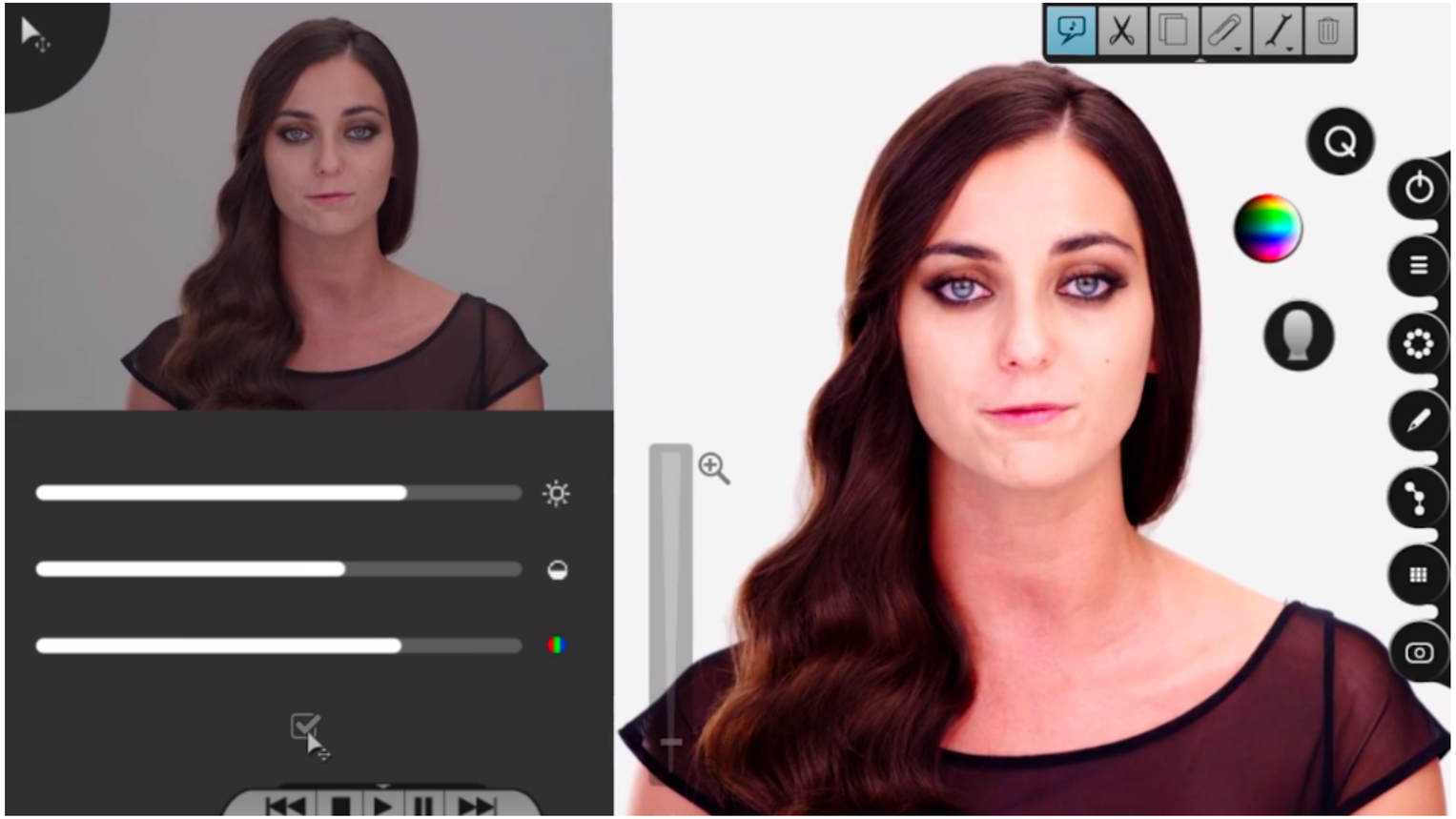


Not just digital

- Makeup
- Lighting
- Pose
- Plastic surgery
- Model selection

Boggie Music Video

- **http://vimeo.com/83502019**



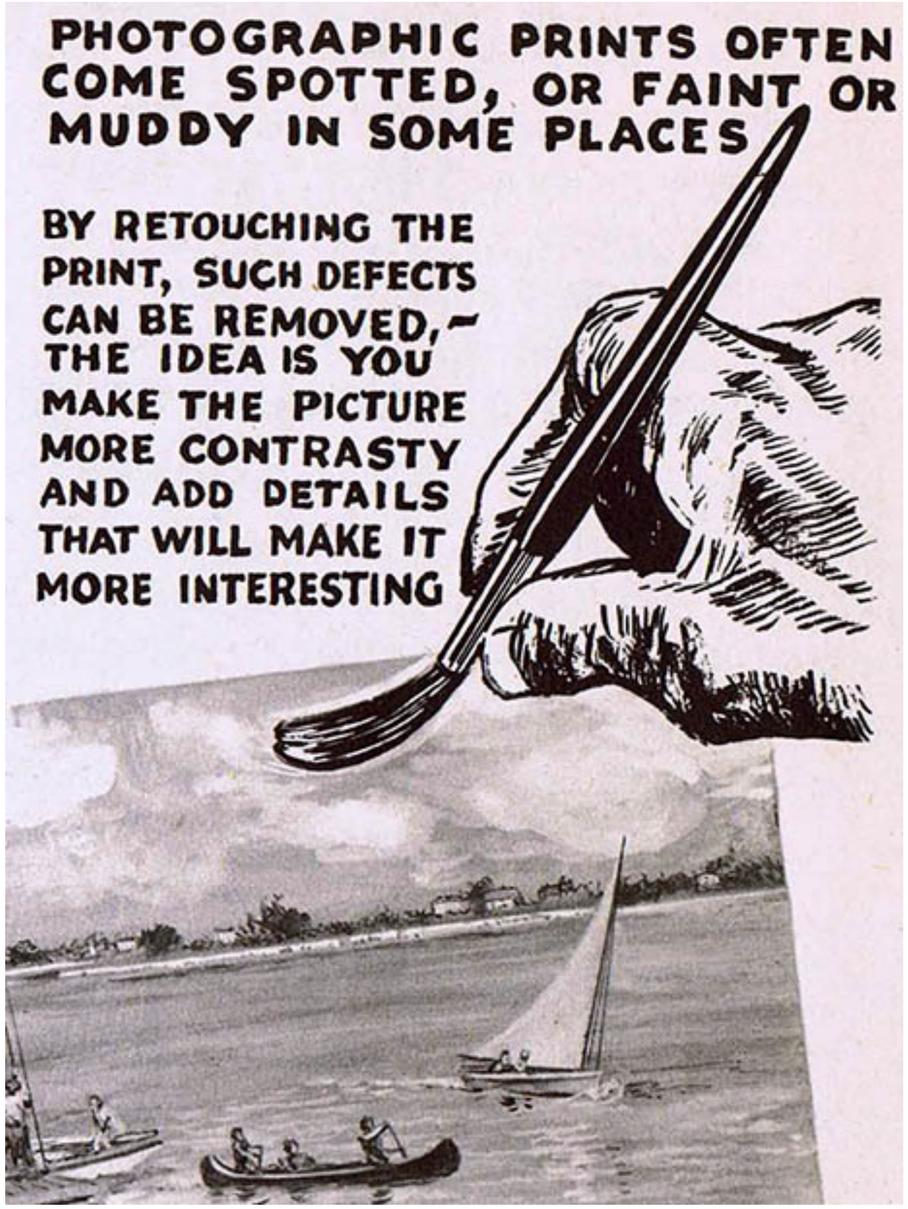
An old practice

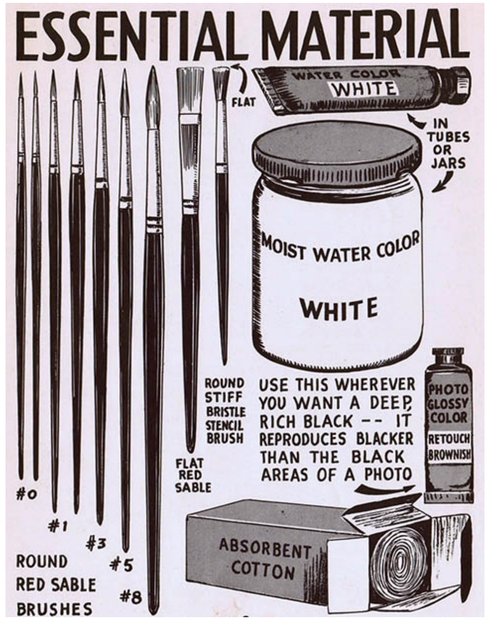
- **Pascal Dangin http://www.newyorker.com/reporting/2008/05/12/080512fa_fact_collins**

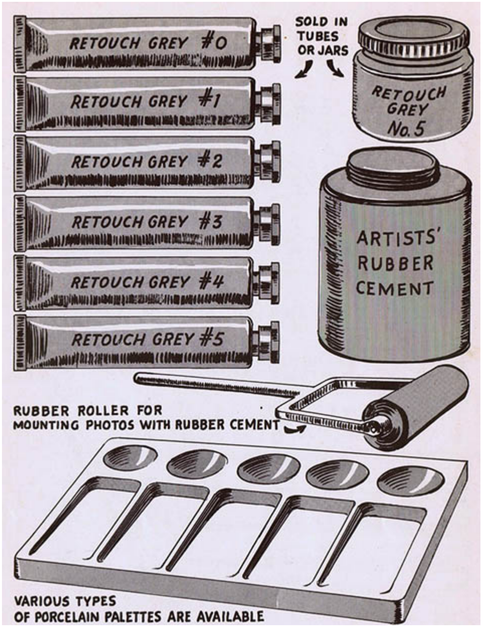
- **My favorite quote: “There is no photographic establishment of any note that does not employ artists at high salaries—we understand not less than £1 a day—in touching, and colouring, and finishing from nature those portraits for which the camera may be said to have laid the foundation,” Lady Elizabeth Eastlake, the art historian and critic, noted in an essay in 1857.**

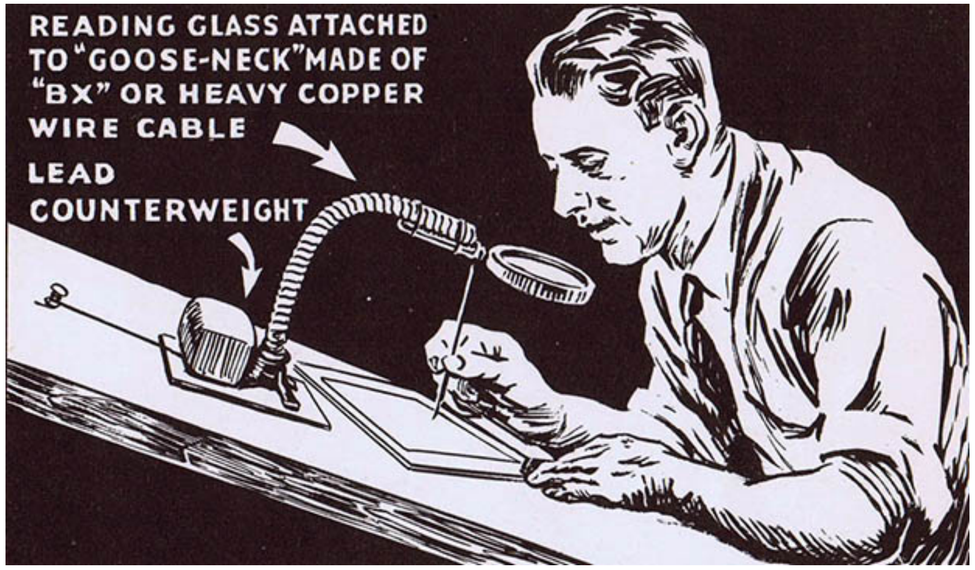
- **http://www.theage.com.au/articles/2003/03/03/1046540121180.html**
- **http://www.time.com/time/fashion/20030908/insider/6.html**

http://petapixel.com/2013/05/08/how-photographers-photoshopped-their-pictures-back-in-1946/

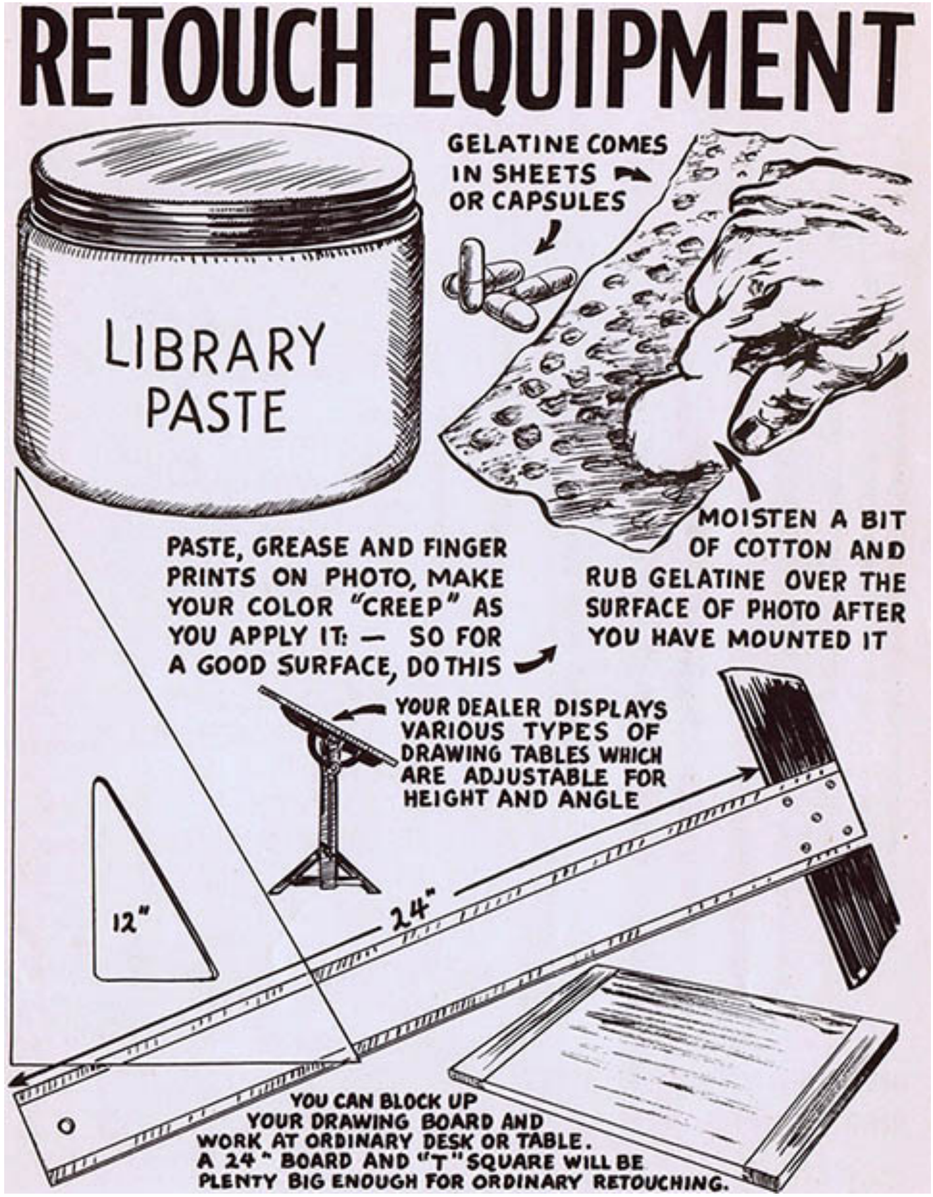


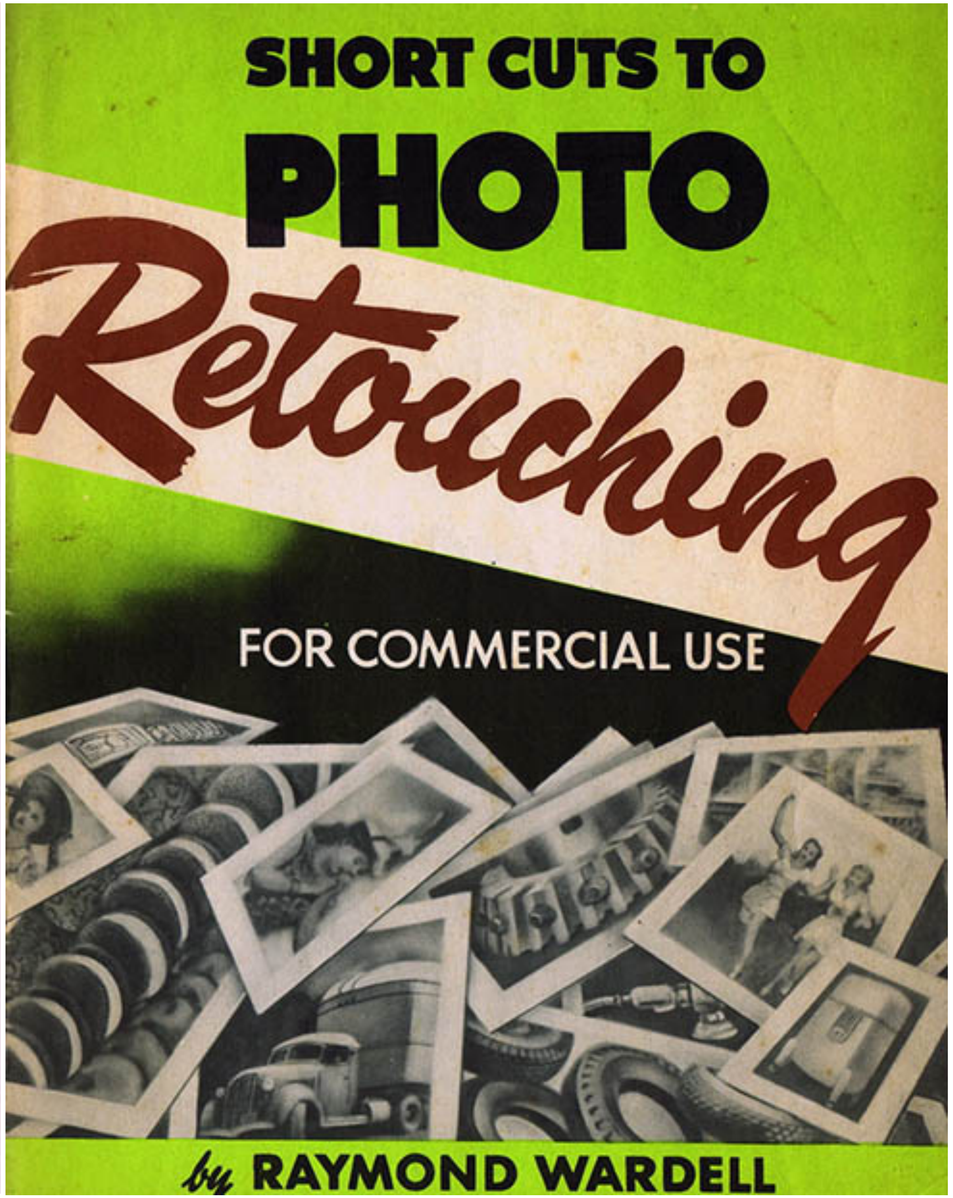




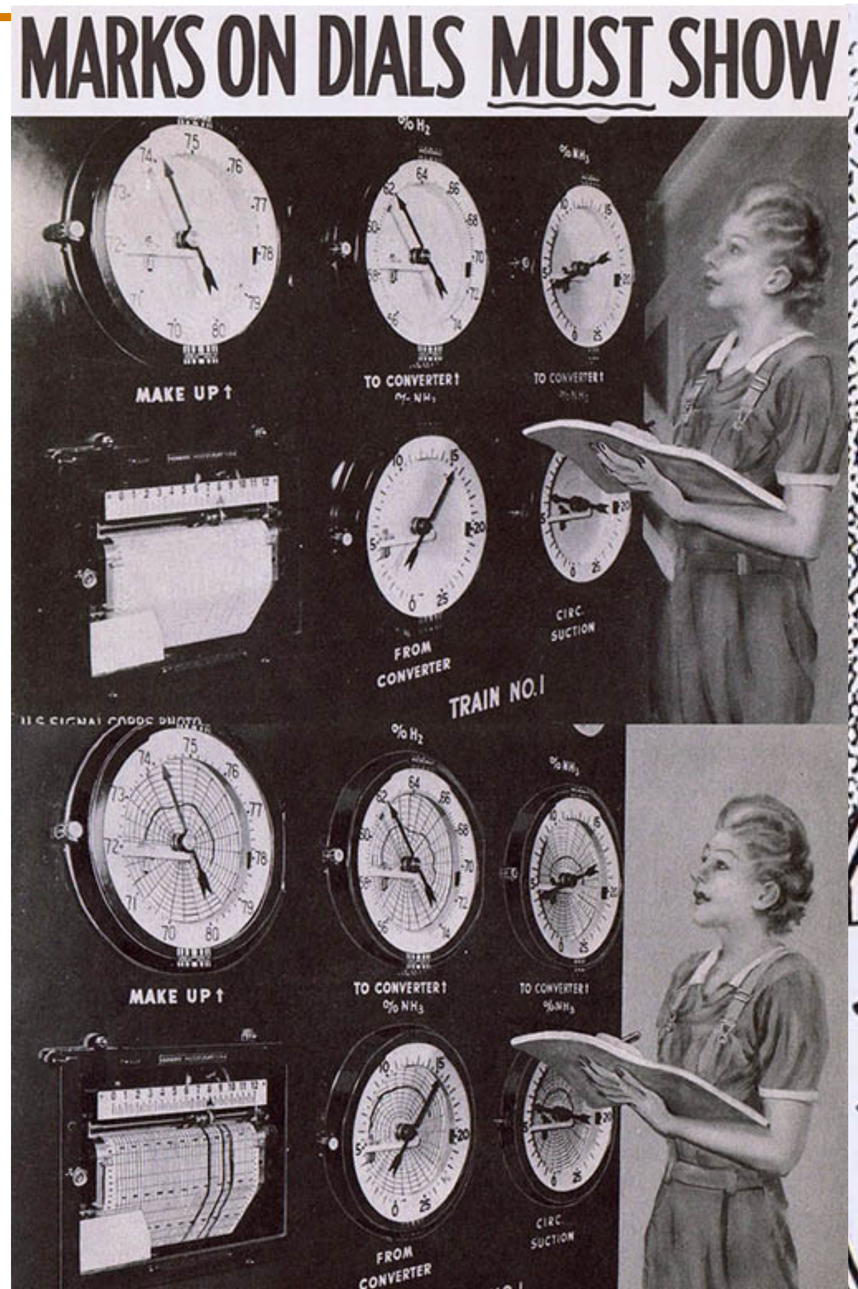


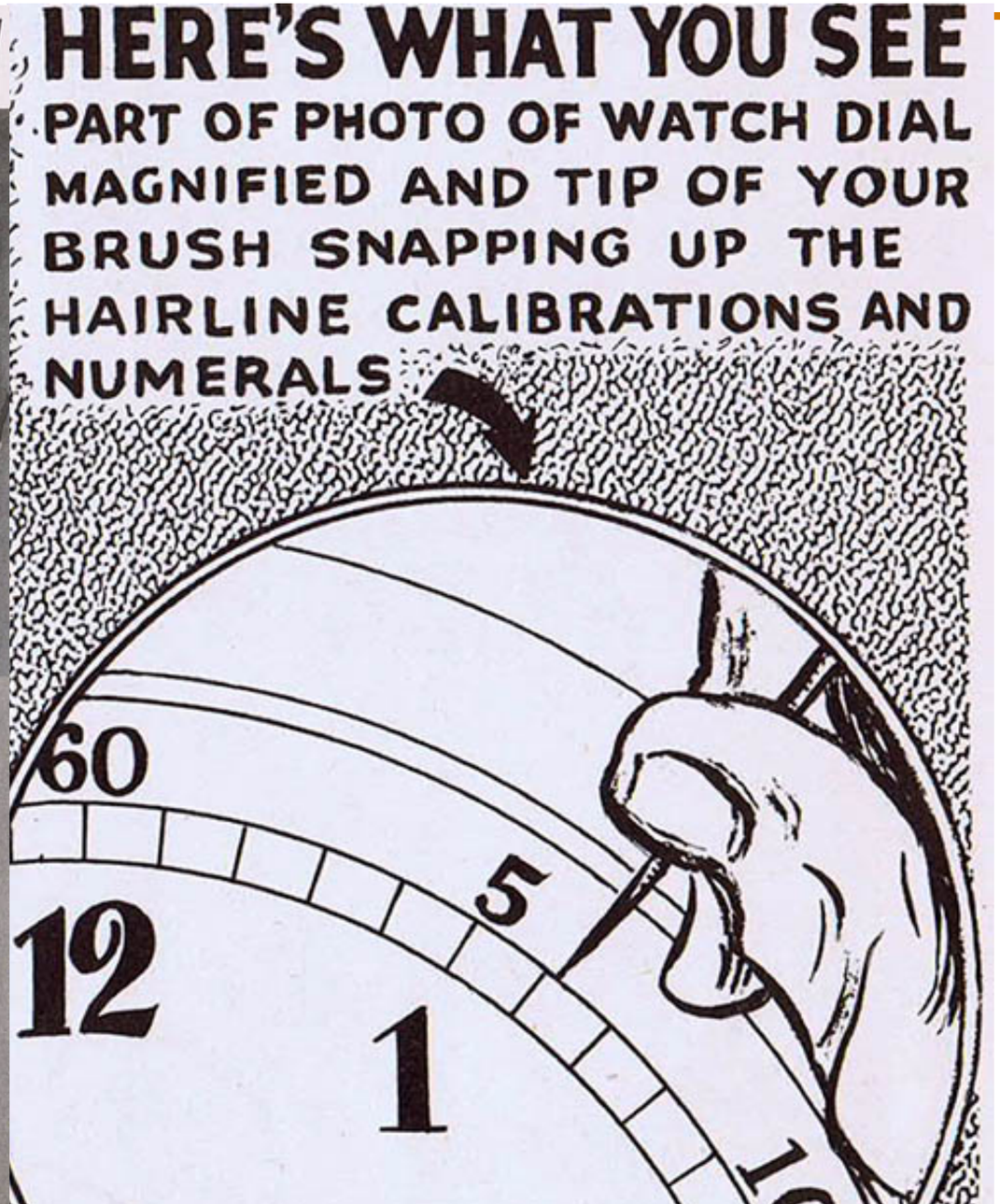
http://petapixel.com/2013/05/08/how-photographers-photoshopped-their-pictures-back-in-1946/





http://petapixel.com/2013/05/08/how-photographers-photoshopped-their-pictures-back-in-1946/





Trick #1: diffuser

- **Other option: soft focus lens (with increased spherical aberrations)**

- **Digital version: blur or surface blur**

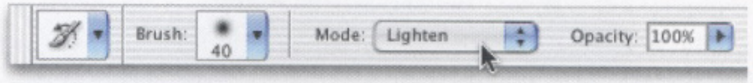
Diffusion

I hate to say "always," but 98% of the time we diffuse each portrait that is taken. Since we are working with subjects who are at an age when skin clarity can be a problem, we recognize that their complexion can't handle the clarity of today's lenses. We use the Glamour Softs by Sailwind (#1). It softens the portrait without losing the critical sharpness in the eyes. I like to use a drop-in filter for easy focusing, especially as I get older.

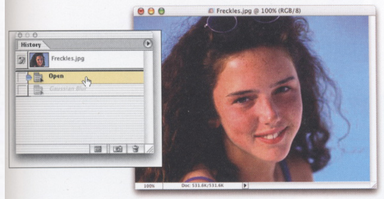
From Corrective Lighting and Posing

Step Six:

To keep from simply painting in a blurry version of our photo, go up to the Options bar and change the History Brush's Blend Mode to Lighten. Now when you paint, it affects only the pixels that are darker than the blurred state. Ahhh, do you see where this is going? Now, you can take the History Brush and paint over the acne areas, and as you paint, you'll see them diminish quite a bit (as shown below). If they diminish too much, and the person looks "too clean," press Command-Z (PC: Control-Z) to undo your History Brush strokes, then go up to the Options bar and lower the Opacity of the brush to 50% and try again.

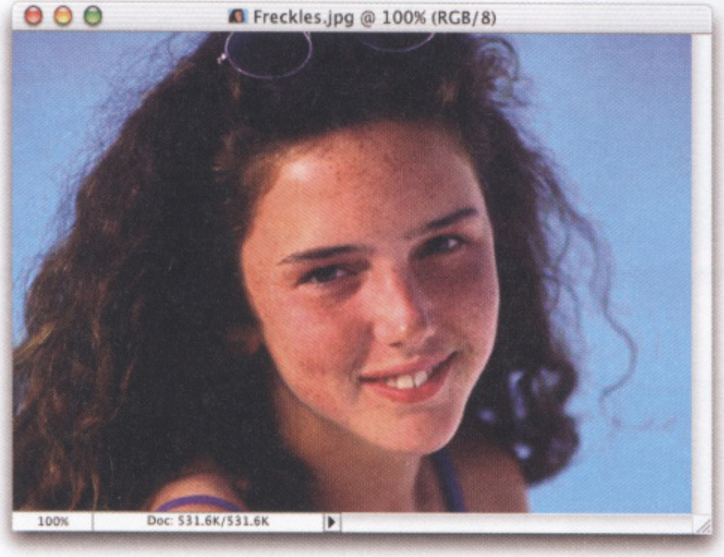


Step Three:
Go under the Window menu and choose History to bring up the History palette. This palette keeps track of the last 20 things you've done in Photoshop. If you look in the list of steps (called "History States"), you should see two States: The first will read "Open" (this is when you opened the document), and the second will read "Gaussian Blur" (this is where you added the blur).

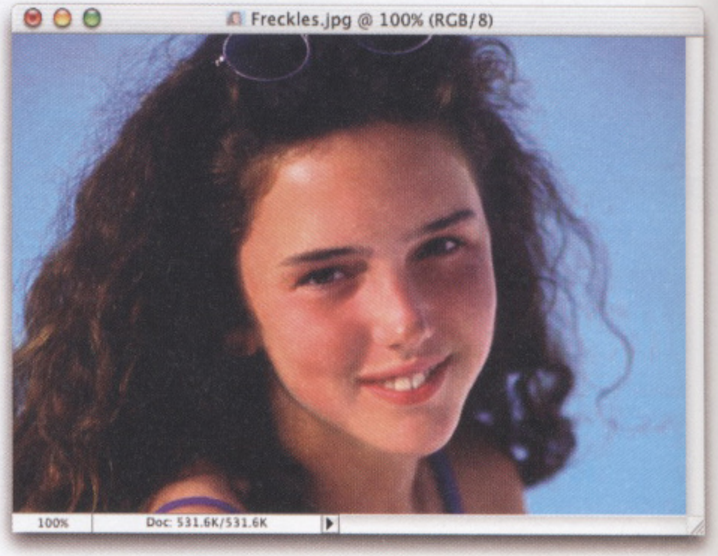


Step Four:
Click on the Open State to return your photo to what it looked like when you originally opened it (as shown here). The History palette also works in conjunction with a tool in the Toolbox called the History Brush. When you paint with it, by default, it paints back to what the photo looked like when you opened it. It's like "Undo on a brush." That can be very handy, but the real power of the History Brush is that you can have it paint from a different state. You'll see what I mean in the next step.

Step Five:
In the History palette, click in the first column next to the State named "Gaussian Blur." If you painted with the History Brush now, it would paint in what the photo looked like after you blurred it (which would do us no good), but we're about to fix that.



Before.

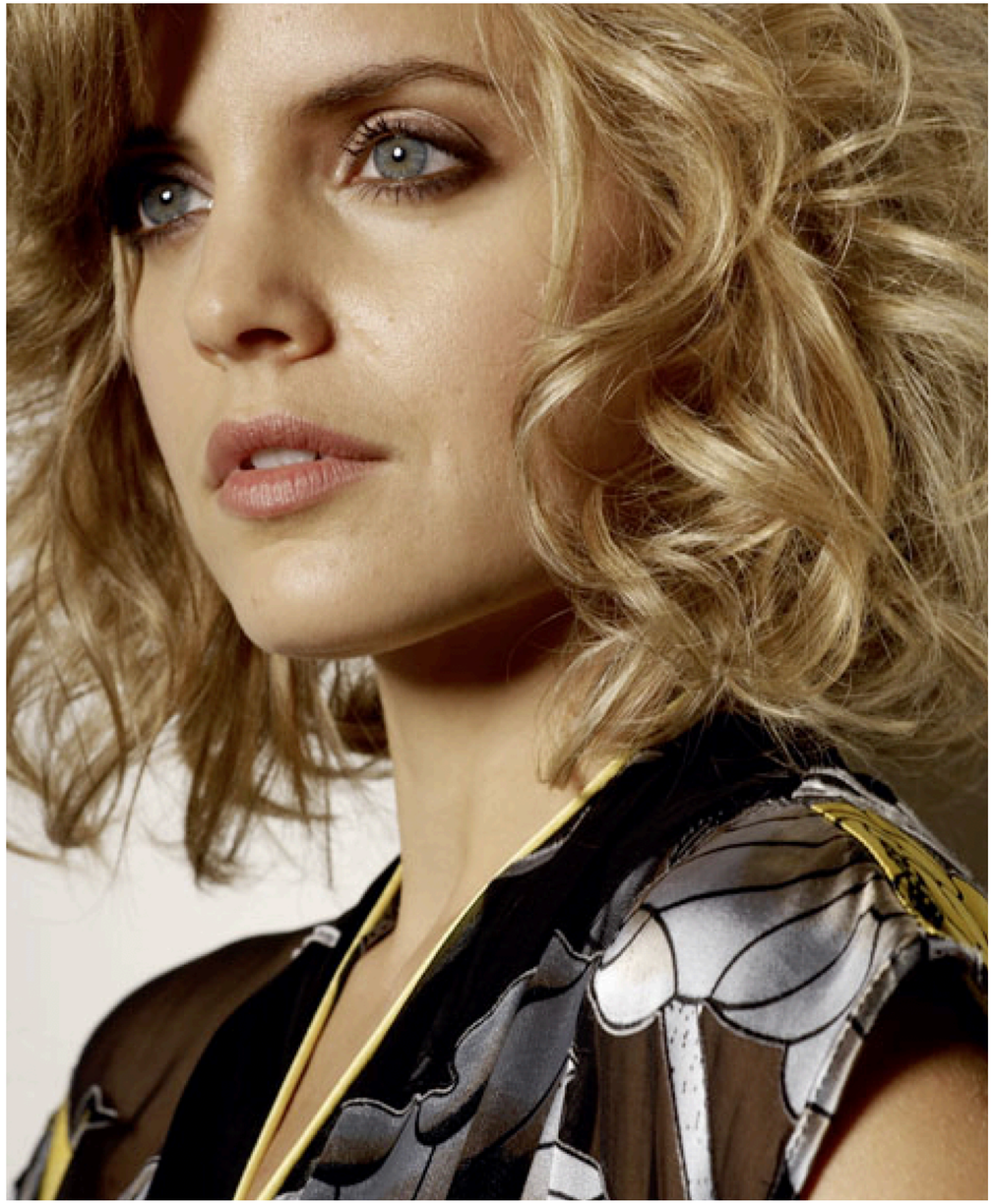


After.

Other photoshop tricks

- **https://lifehacker.com/how-to-use-photoshop-to-pop-pimples-change-facial-expr-5856871**

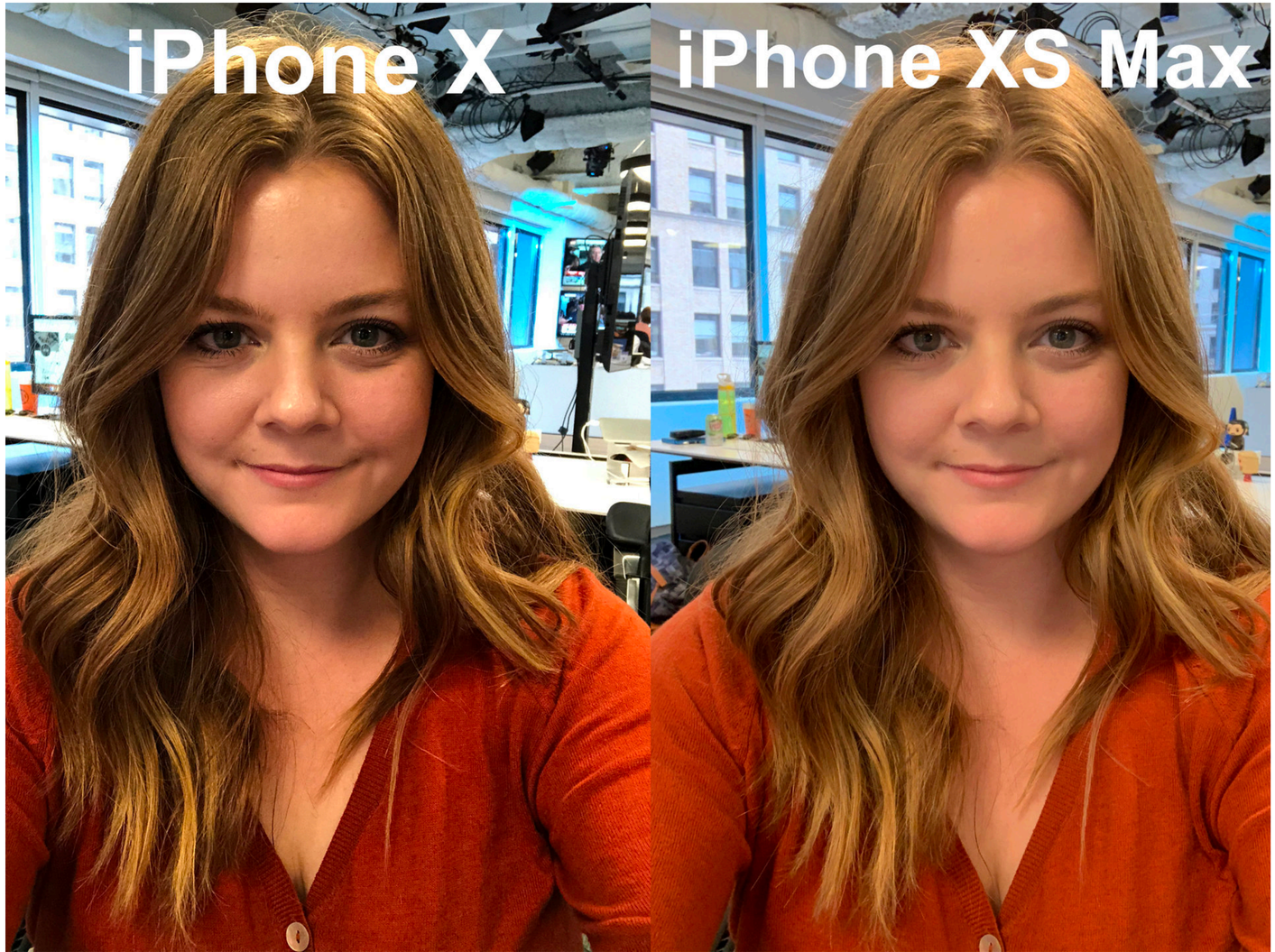
Bilateral filter, surface blur



Where does denoising stop, where does skin retouching start?

iPhoneX beautygate

- https://www.businessinsider.com/beautygate-iphone-xs-camera-appears-to-apply-beauty-mode-to-selfies-2018-9 https://www.imore.com/beautygate

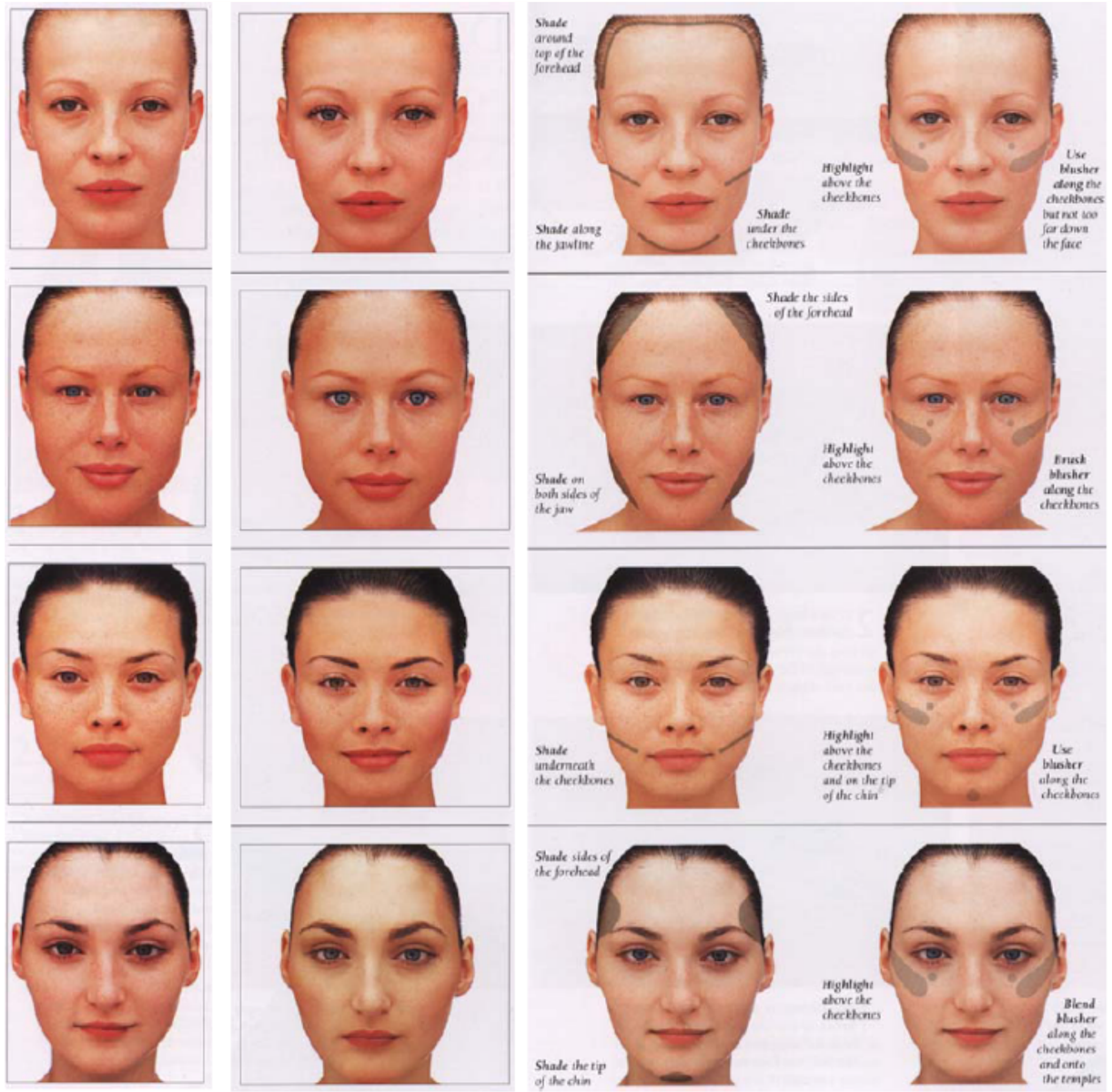


Shading and highlighting

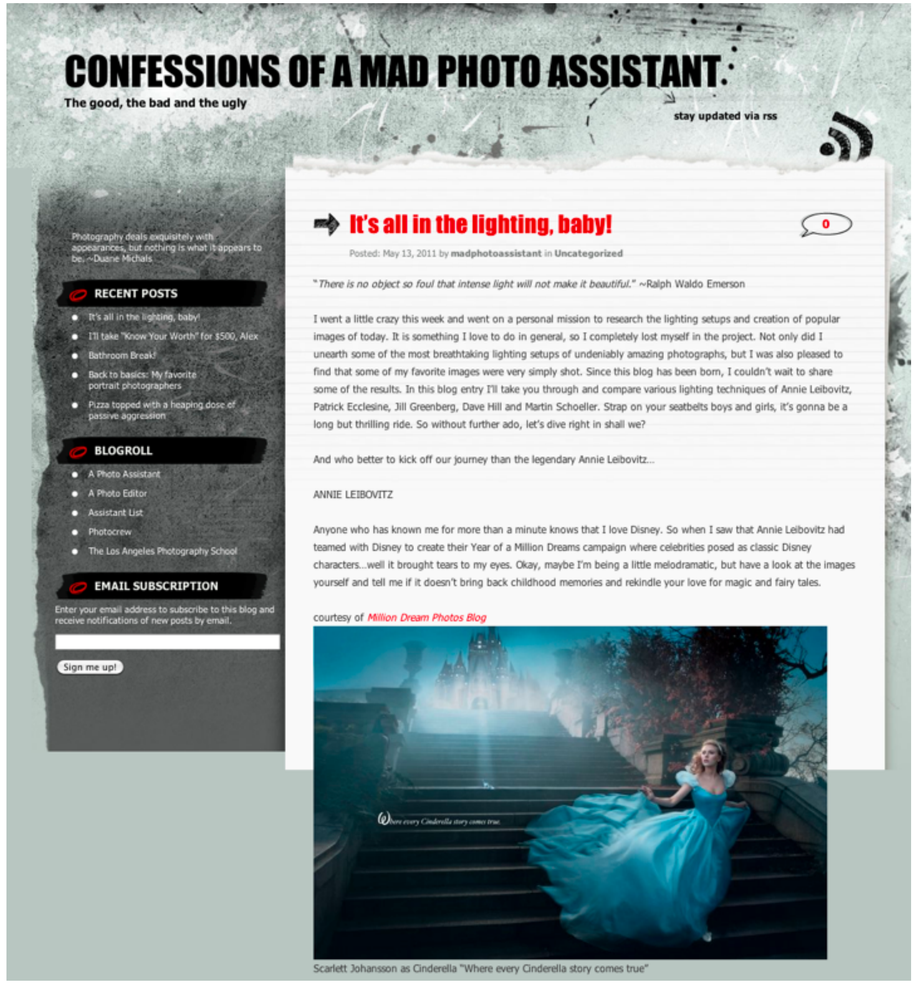
Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-**Make up**-Retouching

Corrective Make Up

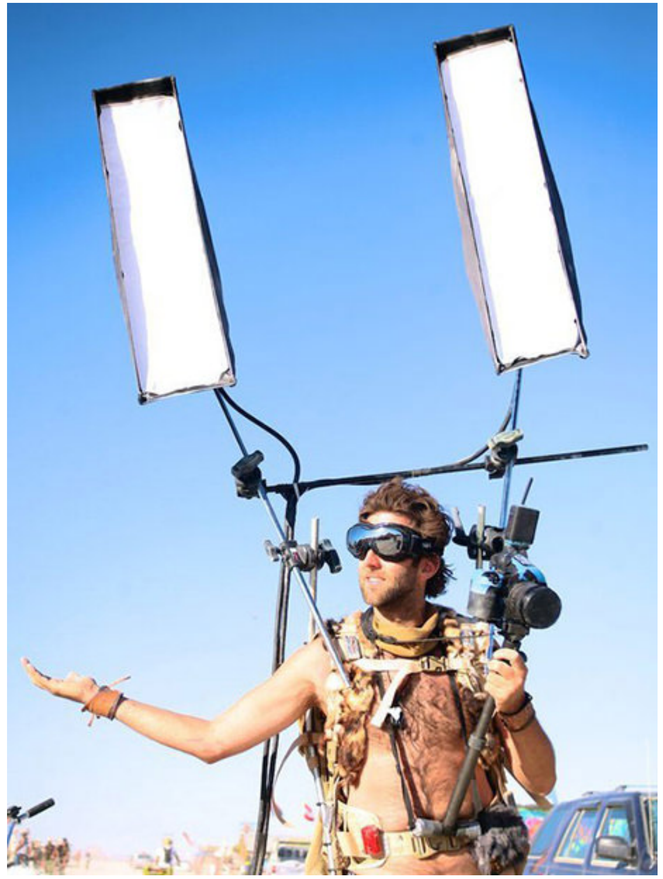
- **Depending on the shape of the face**



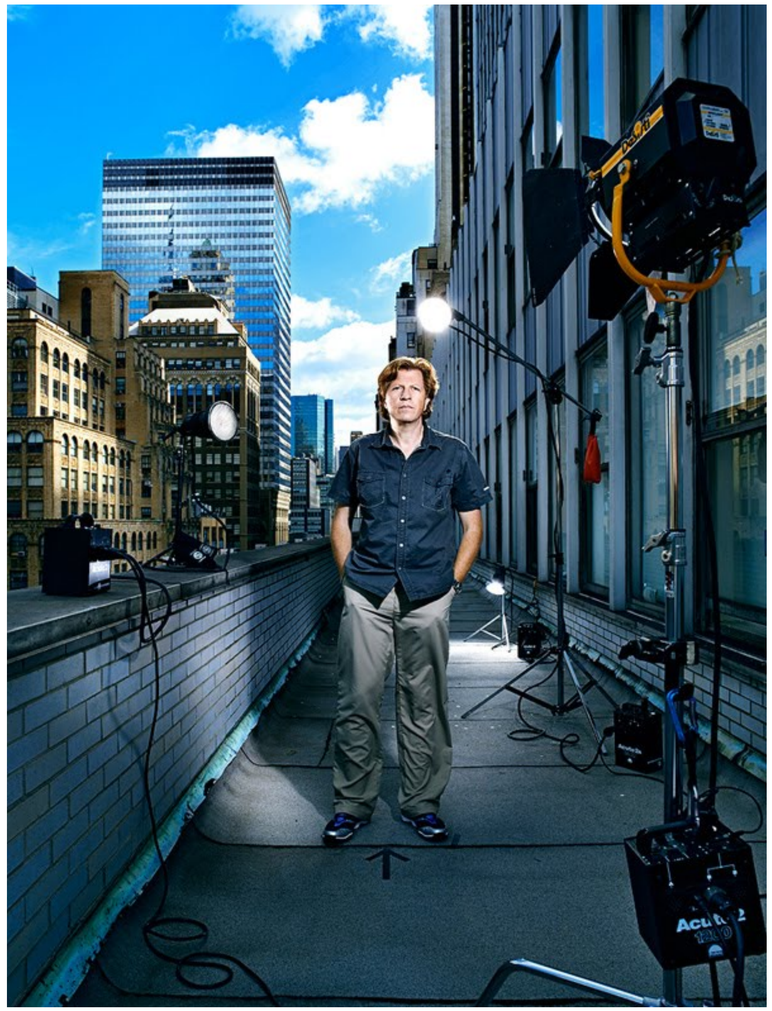
- http://madphotoassistant.wordpress.com/2011/05/13/lighting-title/
-



- **http://www.petapixel.com/2011/09/05/human-light-suit-a-one-man-band-style-mobile-photo-studio/**
-



- **http://strobist.blogspot.com/2010/05/brad-trent-on-fake-reality-of-portraits.html**



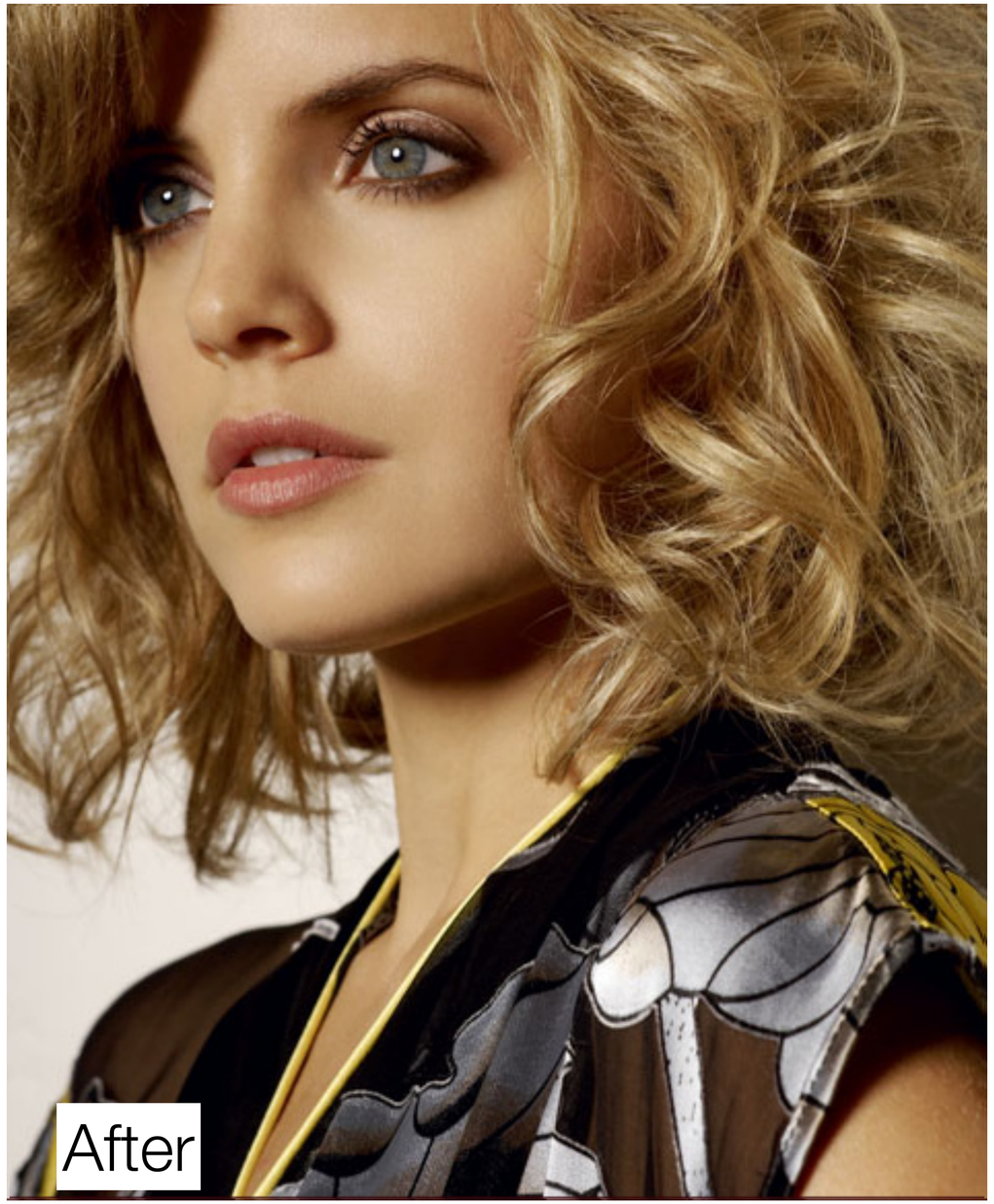
Lighting & nose

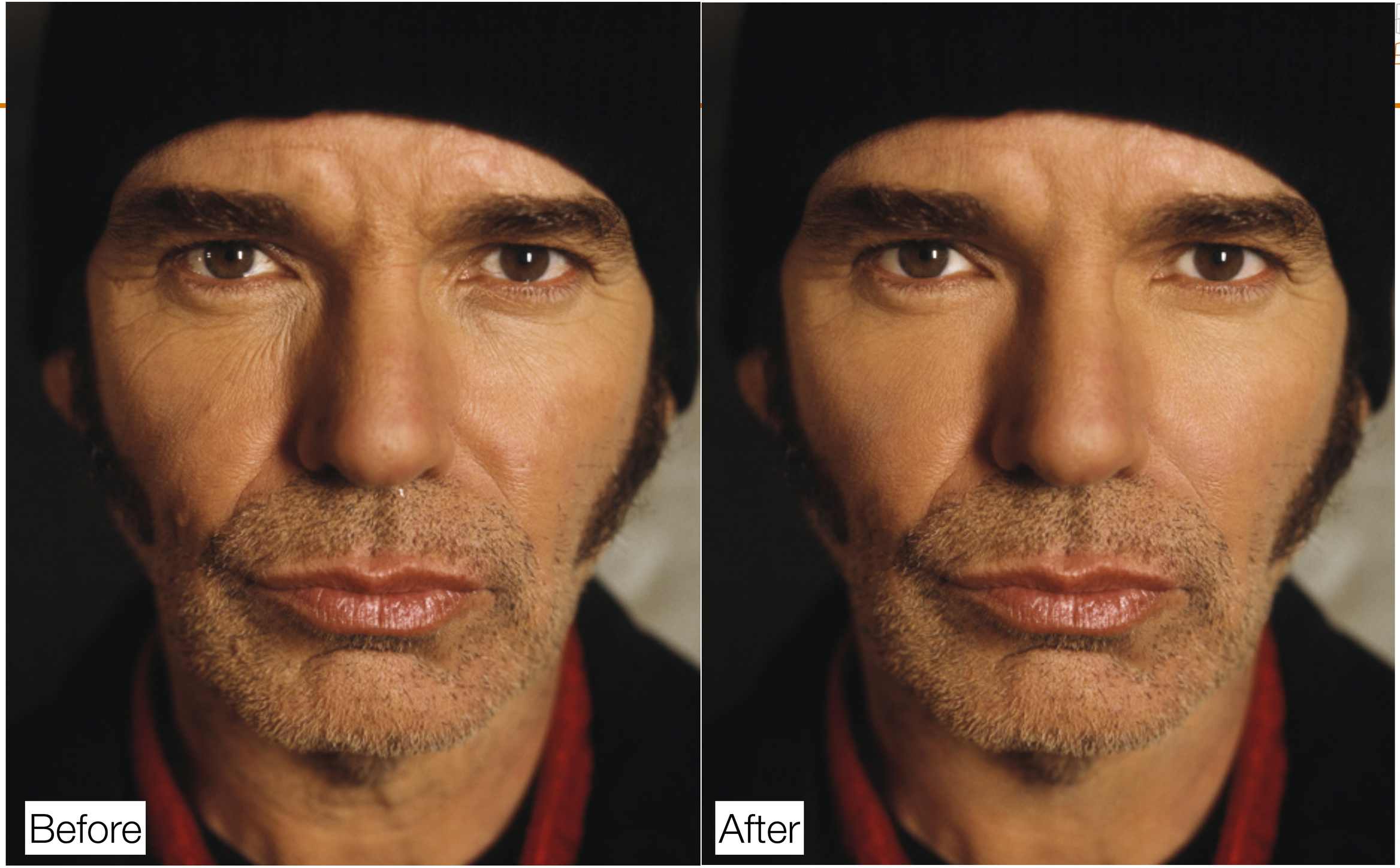
Butterfly lighting can reduce the apparent size of the subject's nose.

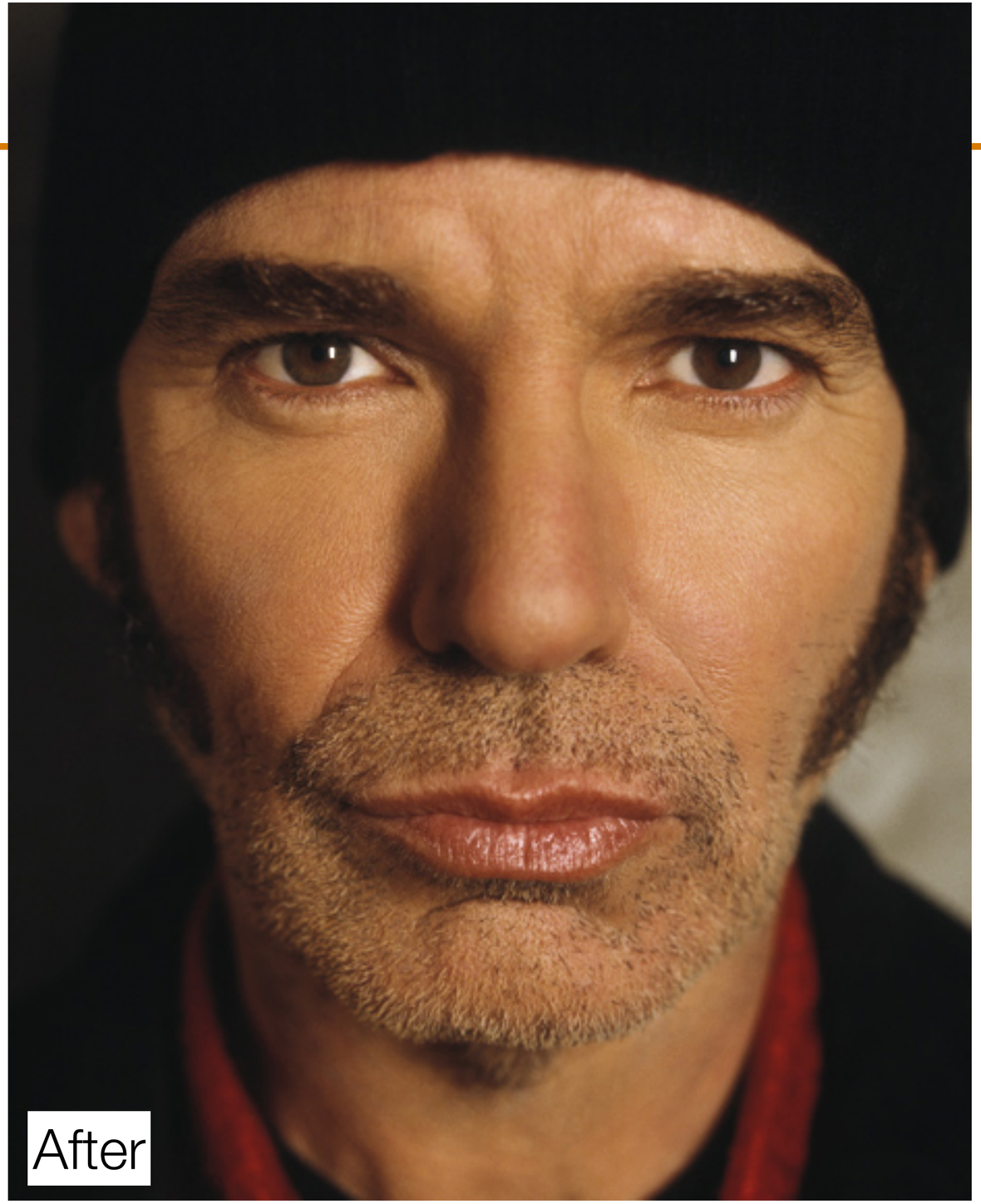
From Corrective Lighting and Posing

Retouching from http://www.fluideffect.com/

Hardcore Photoshop for portrait




Before
After


After

Highlight removal, skin smoothing

Highlight removal, skin smoothing

Skin smoothing, highlight removal

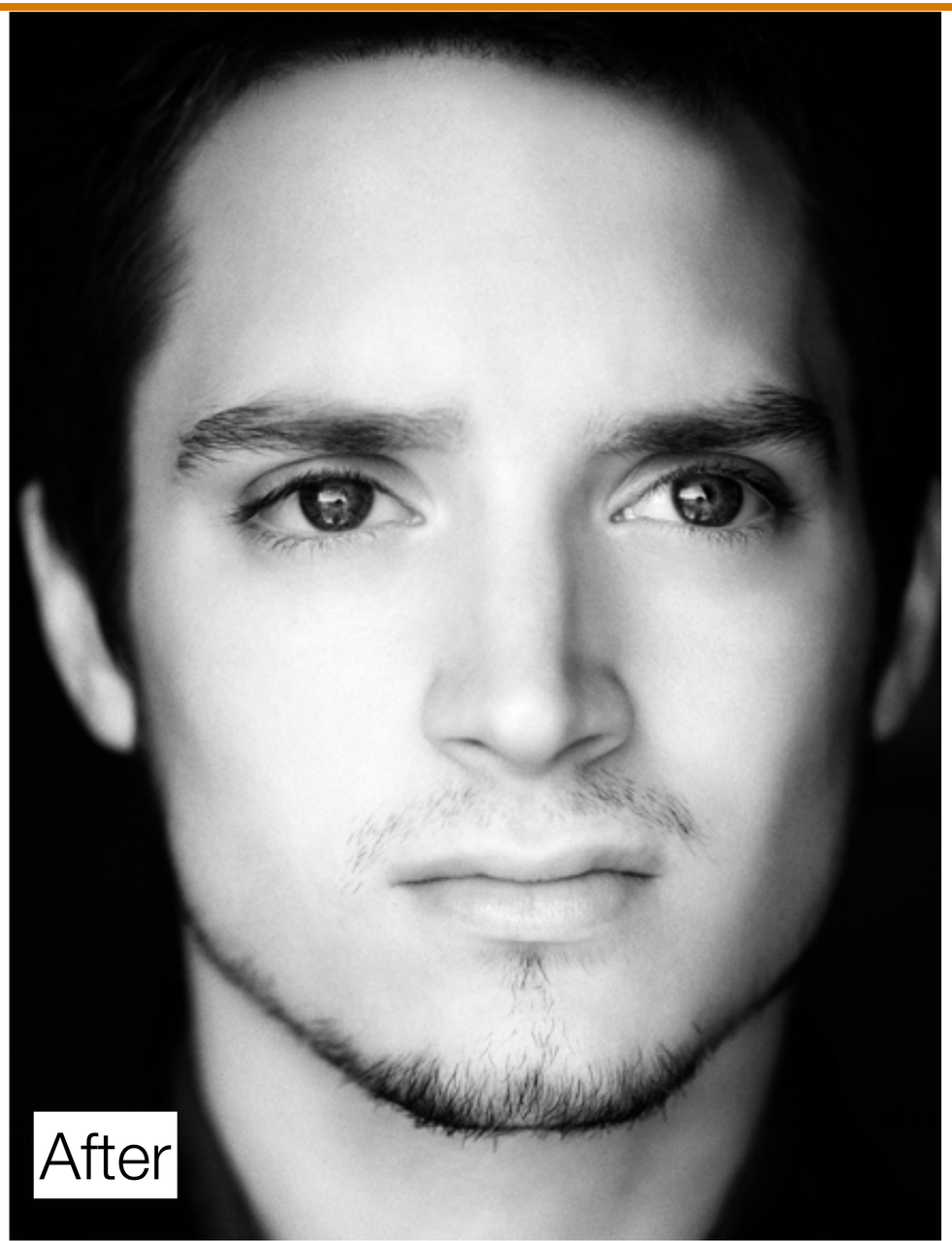
Skin smoothing, highlight removal

Notice the width of the hips

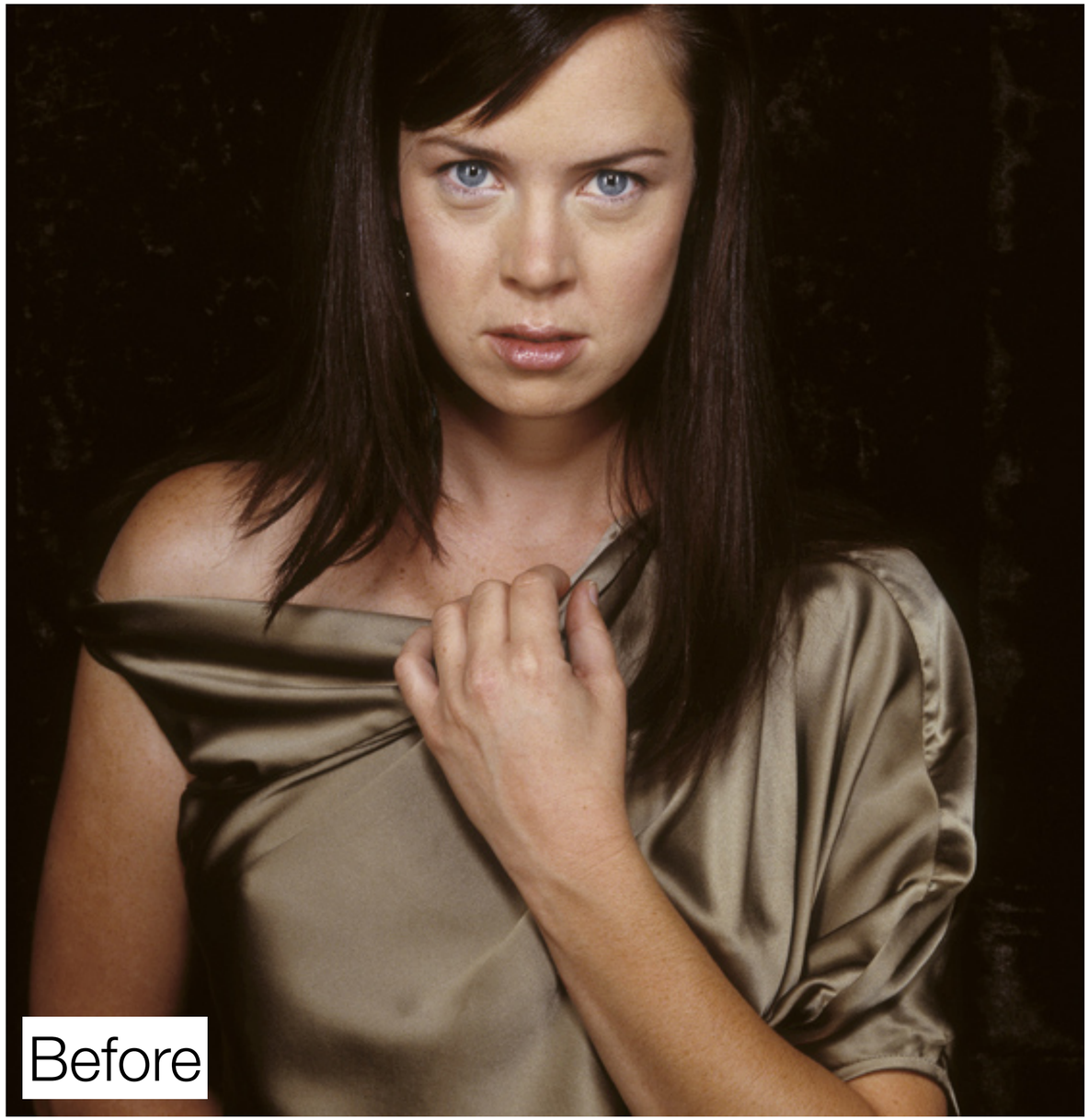
Notice the width of the hips

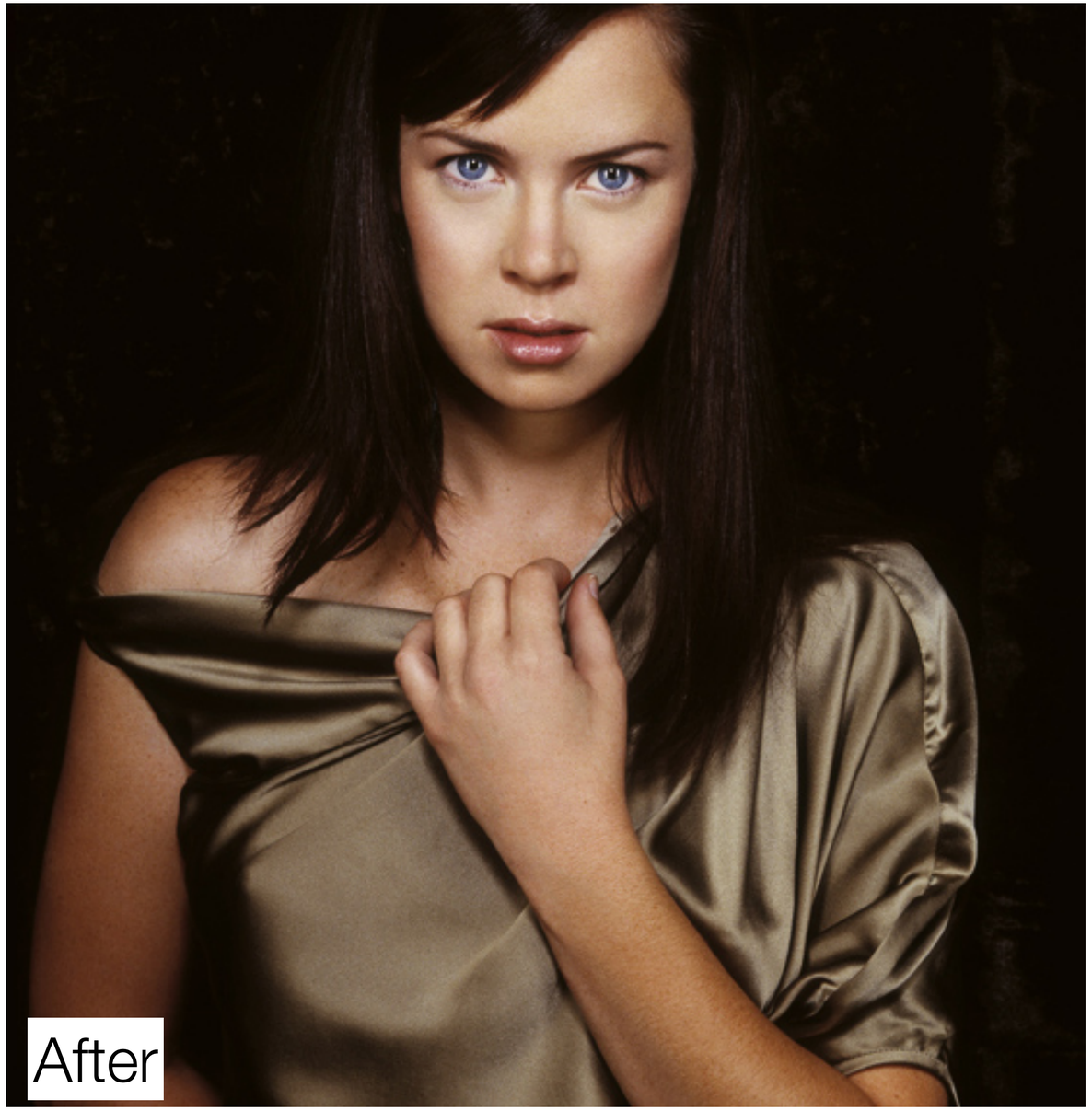
Hair, facial hair, skin

Hair, facial hair, skin

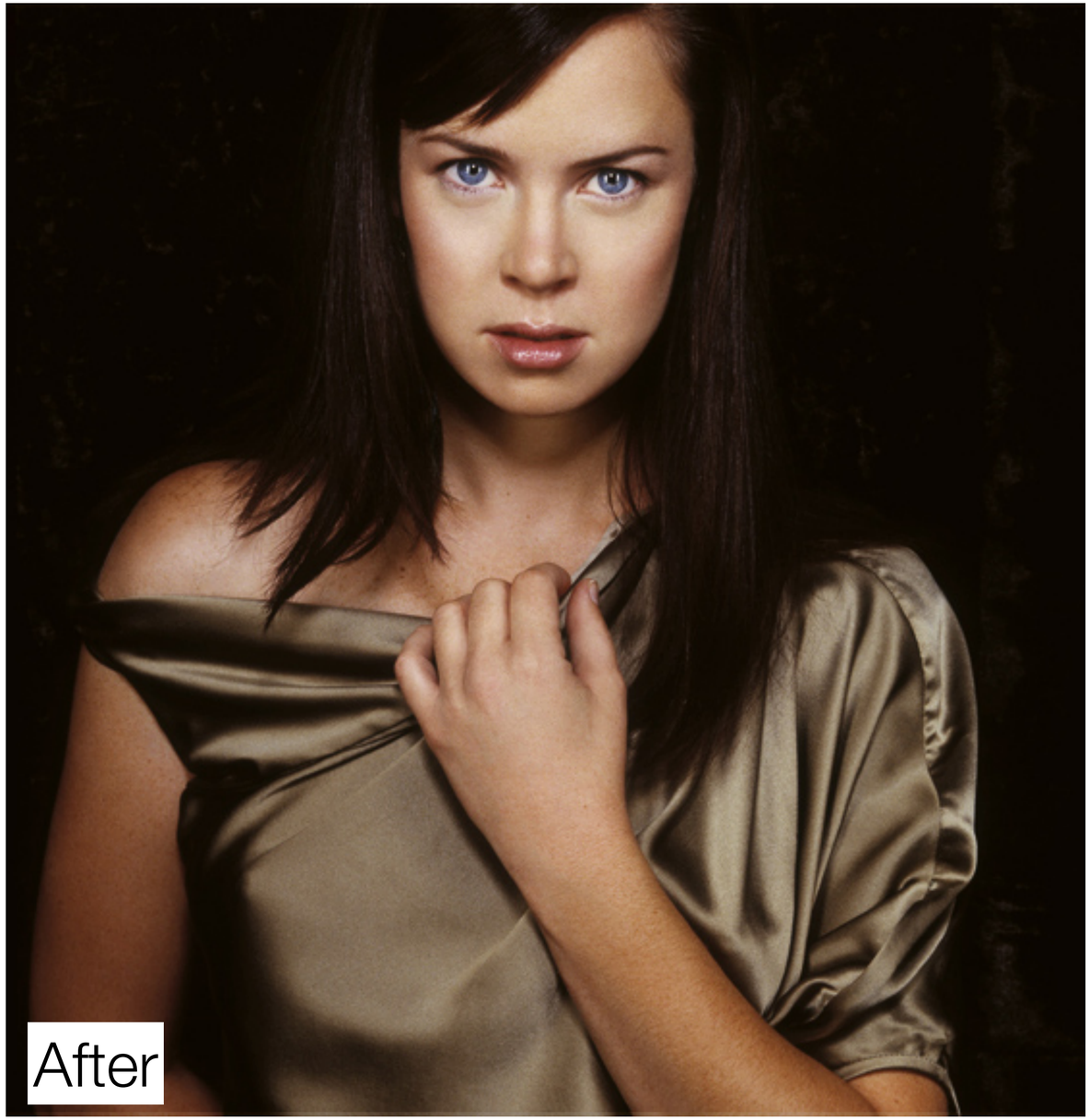


Eyes, skin



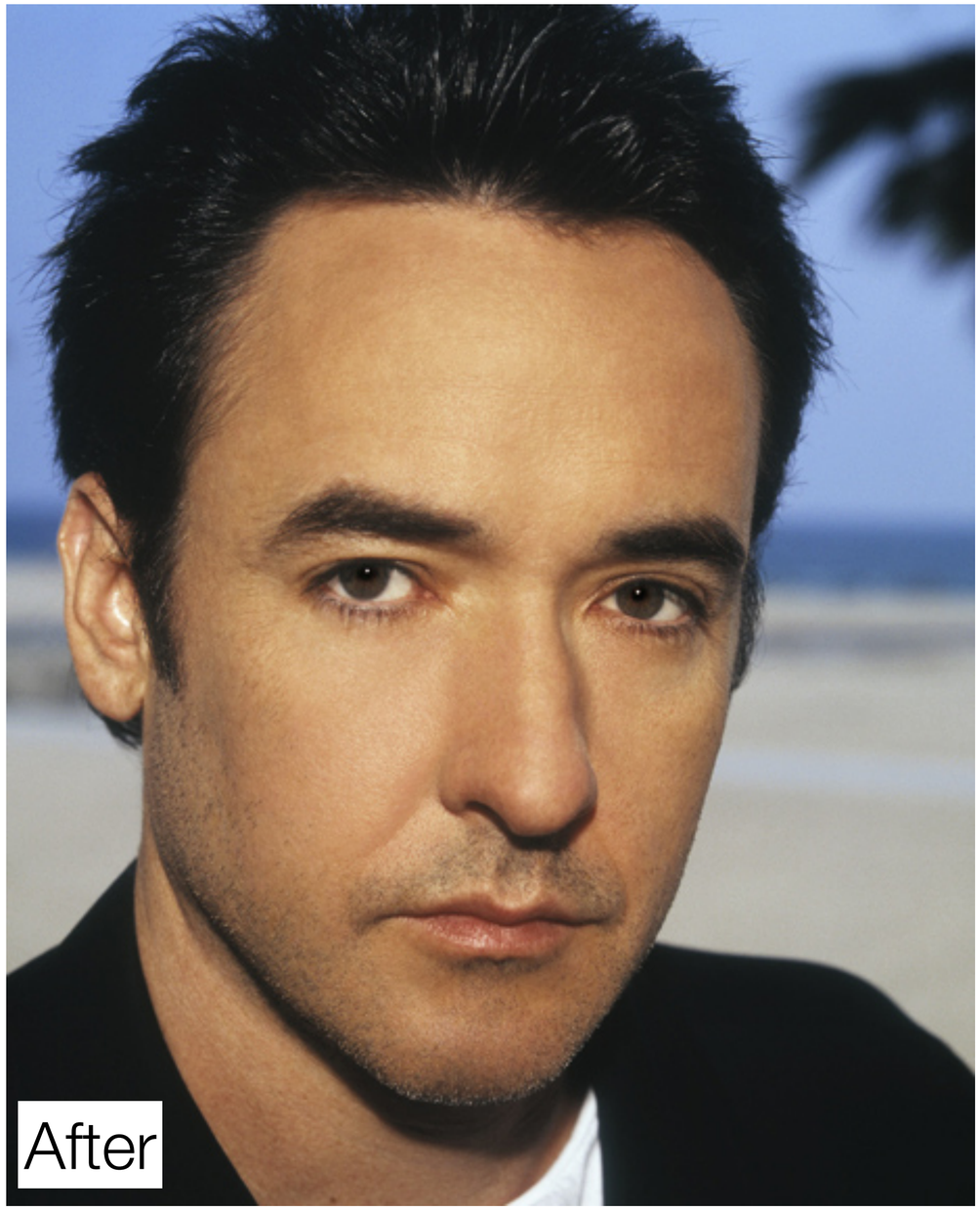


Eyes, skin

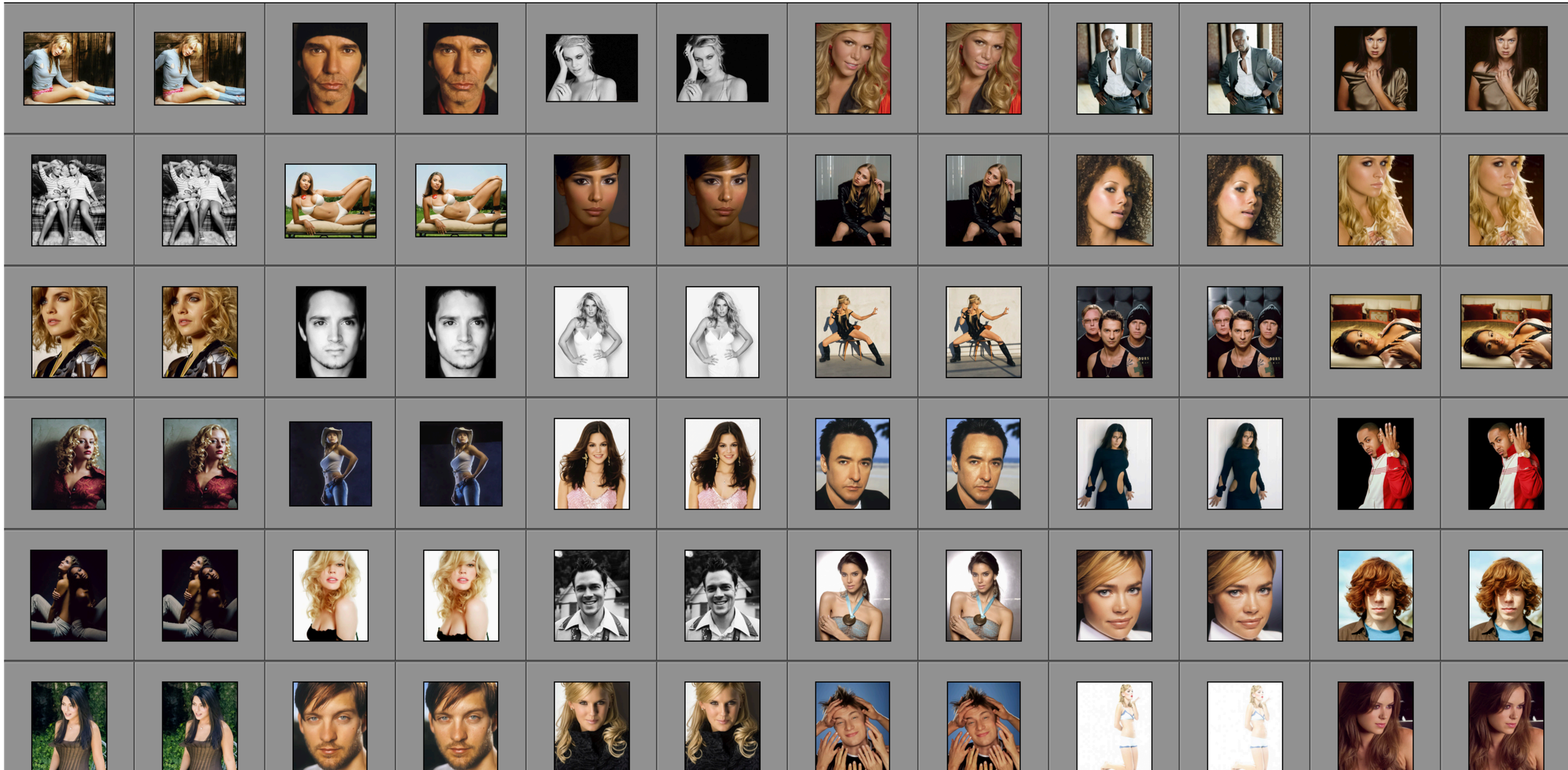


Highlight, wrinkles

Highlight, wrinkles



More before/after at the end of the slide deck



Celebrities

- **Most of the retouching in the previous slides fixes problems that would probably not occur with models because makeup or better lighting would be used**
- **But photographers are on a lot of time pressure with celebrities and often need to resort to post-processing**
- **(which doesn't make it better or worse than make up, it just explains why one is used rather than the other)**

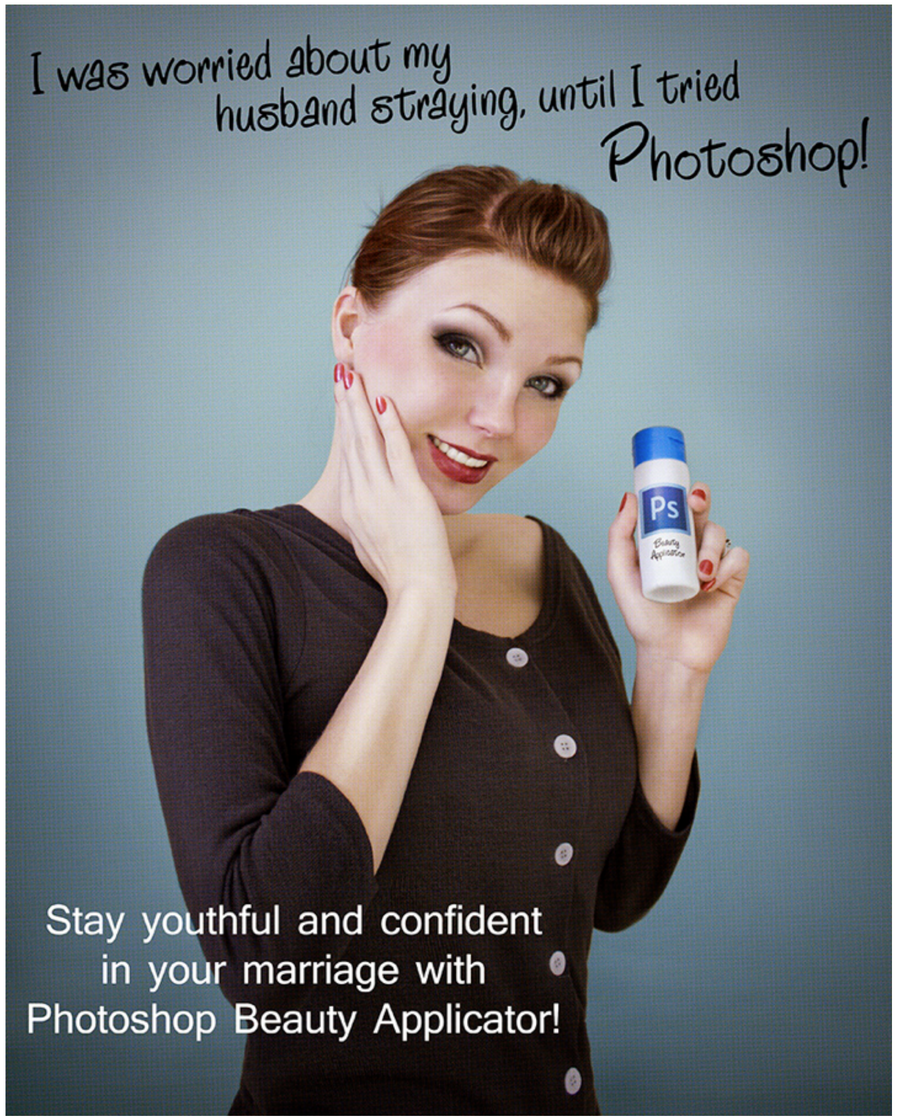
- **Also, somehow, fluid effect only shows the after versions now. http://www.fluideffect.com/**

Fake fake

- https://www.usatoday.com/story/life/people/2015/03/02/cindy-crawford-photo-marie-claire-fake/24249045/
- Left photo is fake, not actual original

Anna Hill pokes fun at Photoshop

- **http://nebulaedecay.com/digi/**



Anna Hill pokes fun at Photoshop

- **http://nebulaedecay.com/digi/**

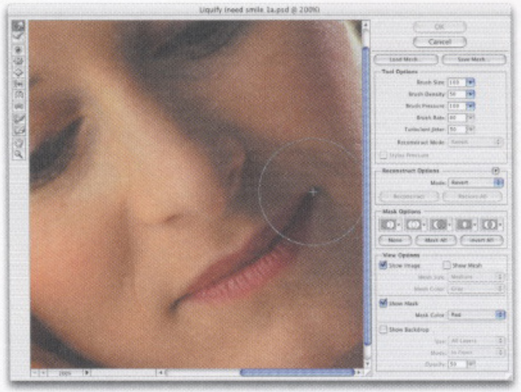
Anna Hill pokes fun at Photoshop

- **http://nebulaedecay.com/digi/**

- **http://petapixel.com/2013/12/19/south-park-takes-photoshop-season-finale-episode/**

figure 9.47

figure 9.48



Step Three:

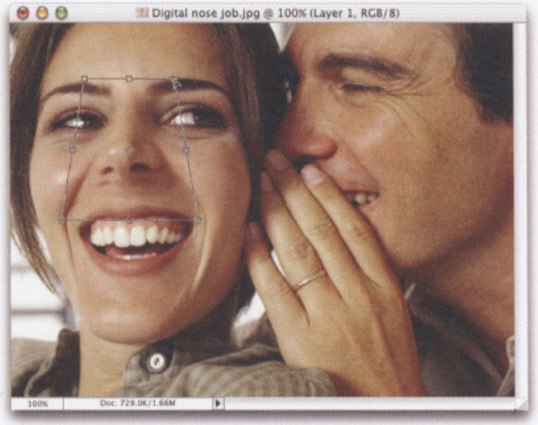
Press the Left/Right Bracket keys on your keyboard to adjust the brush size until it's about the size of the person's cheek. Place the brush near the corner of the mouth (as shown here), click and "tug" slightly up. This tugging of the cheek makes the corner of the mouth turn up, creating a smile.

Step Four:

Repeat the "tug" on the opposite side of the mouth, using the already tugged side as a visual guide as to how far to tug. Be careful not to tug too far, or you'll turn your subject into the Joker from *Batman Returns*. Click OK in Liquify to apply the change, and the retouch is applied to your photo (as shown).

Before.

After.

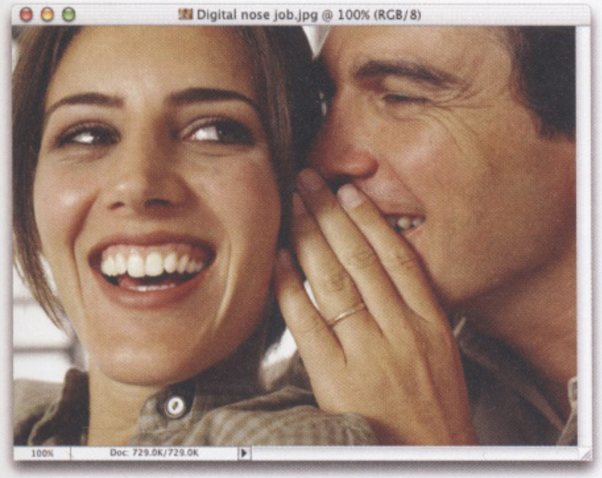


Step Four:

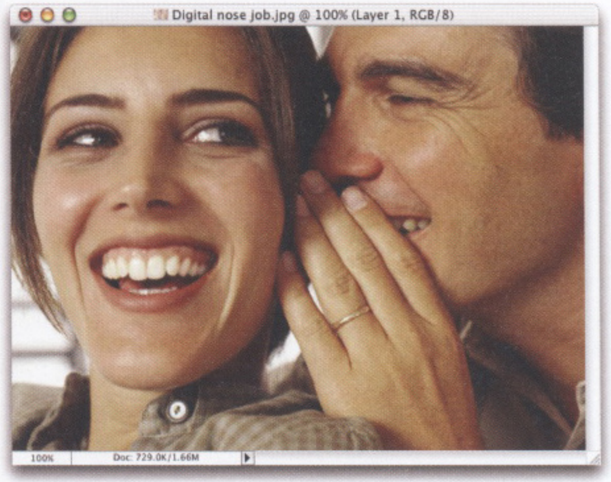
Press Command-T (PC: Control-T) to bring up the Free Transform bounding box. Hold Shift-Option-Command (PC: Shift-Alt-Control); then, grab the upper-right corner point of the bounding box and drag inward to add a perspective effect to the nose. Doing this gives the person a pug nose, but you fix that in the next step.

Step Five:

To get rid of the "pug-nose" effect, release all the keys, then grab the top-center point (as shown) and drag straight downward to make the nose look natural again, but now it's smaller. When the new size looks about right, press Return (PC: Enter) to lock in your changes. If any of the old nose peeks out from behind the new nose, click on the Background layer and use the Clone Stamp tool to clone away those areas: Sample an area next to the nose, and then paint (clone) right over it. Below, see the difference our 30-second retouch made in the image.



Before.



After.

Hardcore Photoshop for portrait

figure 9.35

figure 9.36

© Eric Kuaimoku

figure 9.37

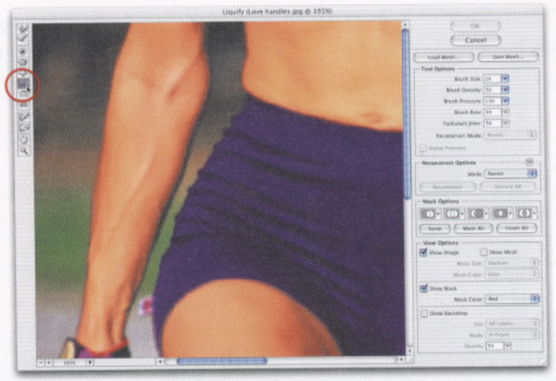
Selecting the entire left side of the image avoids potential artifacts.

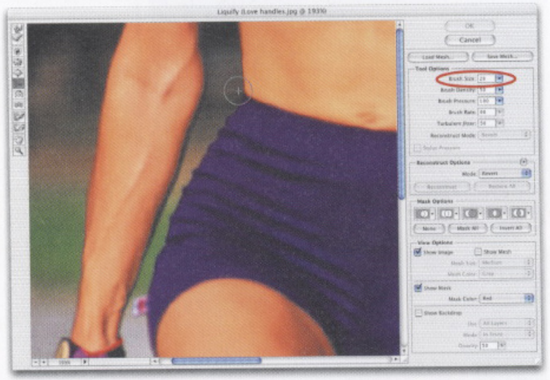
figure 9.38

Dragging a Free Transform handle to narrow the selected area.

figure 9.39

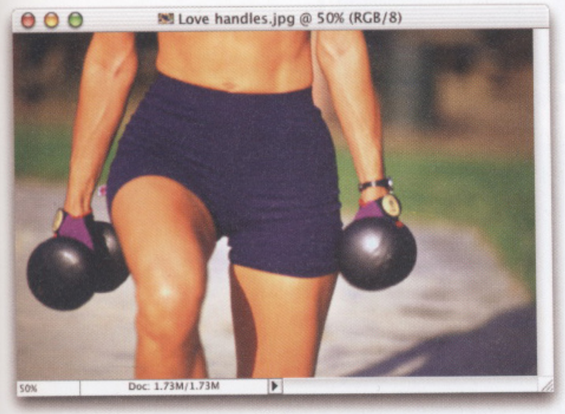
The Liquify filter's Warp tool pushes pixels forward as you drag.



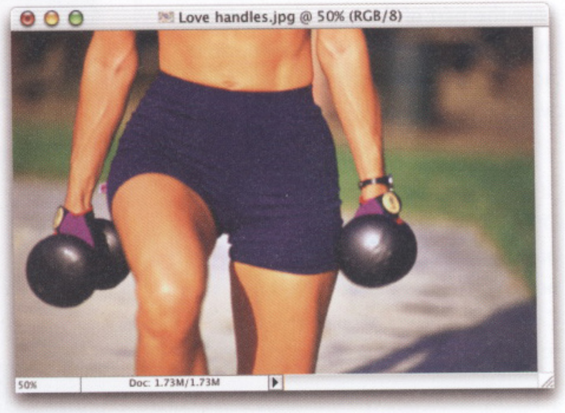


Step Three:
Get the Push Left tool from the Toolbar (as shown here). It was called the Shift Pixels tool in Photoshop 6 and 7, but Adobe realized that you were getting used to the name, so they changed it, just to keep you off balance.

Step Four:
Choose a relatively small brush size (like the one shown here) using the Brush Size field near the top-right of the Liquify dialog. With it, paint a downward stroke starting just above and outside the love handle and continuing downward. The pixels shifts back in toward the body, removing the love handle as you paint. (Note: If you need to remove love handles on the left side of the body, paint upward rather than downward. Why? That's just the way it works.) When you click OK, the love handle repair is complete.



Before.



After.

See also http://www.youtube.com/watch?v=hsiQptl_Y9E

Touch-up: stretc

Funny examples

- Google “photoshop fail”
- https://www.boredpanda.com/worst-photoshop-fails/?utm_source=google&utm_medium=organic&utm_campaign=organic
- https://www.boredpanda.com/worst-photoshop-mistakes/?utm_source=google&utm_medium=organic&utm_campaign=organic
-

PHOTO RETOUCHERS GET
CONFUSED
WHEN THEY'RE HUNGRY
®/TM trademarks ©Mars, Incorporated 2016
SNICKERS

Yearbook

- https://www.nbcnews.com/news/us-news/altered-yearbook-photos-utah-high-school-spark-controversy-n118496
-

Not just body

seventeen magazine's BODY PEACE TREATY

We vow to...

- Help make your life amazing! You have ***big dreams*** and we want you to achieve every single one of them!
- Never change girls' body or face shapes. (Never have, never will.)
- Celebrate ***every kind of beauty*** in our pages. Without a range of body types, skin tones, heights, and hair textures, the magazine—and the world—would be boring!
- Always feature real girls and models who are healthy. Regardless of clothing size, being healthy is about honoring your natural shape.
- Be totally up-front about what goes into our photo shoots. You can go ***behind the scenes*** on our Tumblr (***seventeen.tumblr.com***) and see the whole shebang!
- Help you make the ***best choices*** for your body—food that fuels you, exercise that energizes you—so you can feel your absolute best each day.
- Give you the confidence to walk into any room and ***own it.*** Say bye-bye to those nagging insecurities that you're not good enough or pretty enough—they're holding you back from being awesome in the world!
- ***Listen carefully to you.*** If something in the magazine confuses you or makes you feel bad, we want hear about it. You can e-mail us anytime at ***mail@seventeen.com*** or reach out to me directly at ***ann@seventeen.com***.

XOXO
-A.

what really changes!

Here's a peek at the minor tweaks we made to a fashion picture of Magdalena, 21. A few messy details—cleaned up. Her gorgeous smile—totally authentic!

@ANNSHOKET Tweet me anytime!

ANN: PERRY HAGOPIAN. FASHION: STEPHANIE MCNIEL.

Samsung beauty face

Data-Driven Enhancement of Facial Attractiveness

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Tel-Aviv University

Daniel Cohen-Or
Tel-Aviv University

Gideon Dror
Academic College of Tel-Aviv-Yaffo

Dani Lischinski
The Hebrew University

Abstract

When human raters are presented with a collection of shapes and asked to rank them according to their aesthetic appeal, the results often indicate that there is a statistical consensus among the raters. Yet it might be difficult to define a succinct set of rules that capture the aesthetic preferences of the raters. In this work, we explore a data-driven approach to aesthetic enhancement of such shapes. Specifically, we focus on the challenging problem of enhancing the aesthetic appeal (or the *attractiveness*) of human faces in frontal photographs (portraits), while maintaining close similarity with the original.

The key component in our approach is an automatic facial attractiveness engine trained on datasets of faces with accompanying facial attractiveness ratings collected from groups of human raters. Given a new face, we extract a set of distances between a variety of facial feature locations, which define a point in a high-dimensional "face space". We then search the face space for a nearby point with a higher predicted attractiveness rating. Once such a point is found, the corresponding facial distances are embedded in the plane and serve as a target to define a 2D warp field which maps the original facial features to their adjusted locations. The effectiveness of our technique was experimentally validated by independent rating experiments, which indicate that it is indeed capable of increasing the facial attractiveness of most portraits that we have experimented with.

Keywords: facial attractiveness, machine learning, optimization, warping

Figure 1: Input facial images (left) and the adjusted images generated by our method (right). The changes are subtle, yet their impact is significant.

1 Introduction

Pressures both for and against retouching

- From models/actors
- From Editors
- Public

zendaya
56.1m followers

View Profile

View More on Instagram

855,158 likes

zendaya

Had a new shoot come out today and was shocked when I found my 19 year old hips and torso quite manipulated. These are the things that make women self conscious, that create the unrealistic ideals of beauty that we have. Anyone who knows who I am knows I stand for honest and pure self love. So I took it upon myself to release the real pic (right side) and I love it😍 😘 Thank you @modelistemagazine for pulling down the images and fixing this retouch issue.

view all 23,677 comments

Add a comment...

- Lady Gaga spoke out against her Glamour cover photo because she felt her “skin looked too perfect” and her “hair looked too soft.”
- https://www.pixelz.com/blog/photoshop-models-laws/
- See also Beyonce H&M

KeiraKnightley

Public pressure

- Ralph Lauren publicly apologized

Some countries are banning excessive photoshop

- **http://www.petapixel.com/2011/07/27/julia-roberts-makeup-ads-banned-in-uk-for-too-much-photoshop/**

- https://petapixel.com/2017/09/26/getty-images-bans-photos-containing-photoshopped-weight/

Fredo's take

- **Retouching for beauty is older than photography and photo retouching started almost as soon as photography was invented**
- **For beauty standards, good discussions and reactions have been trigerred by the wide availability of digital retouching but the problem is far from resolved**
- **It unfortunately goes well beyond digital tools**

Bias and inclusion in computational photography and AI

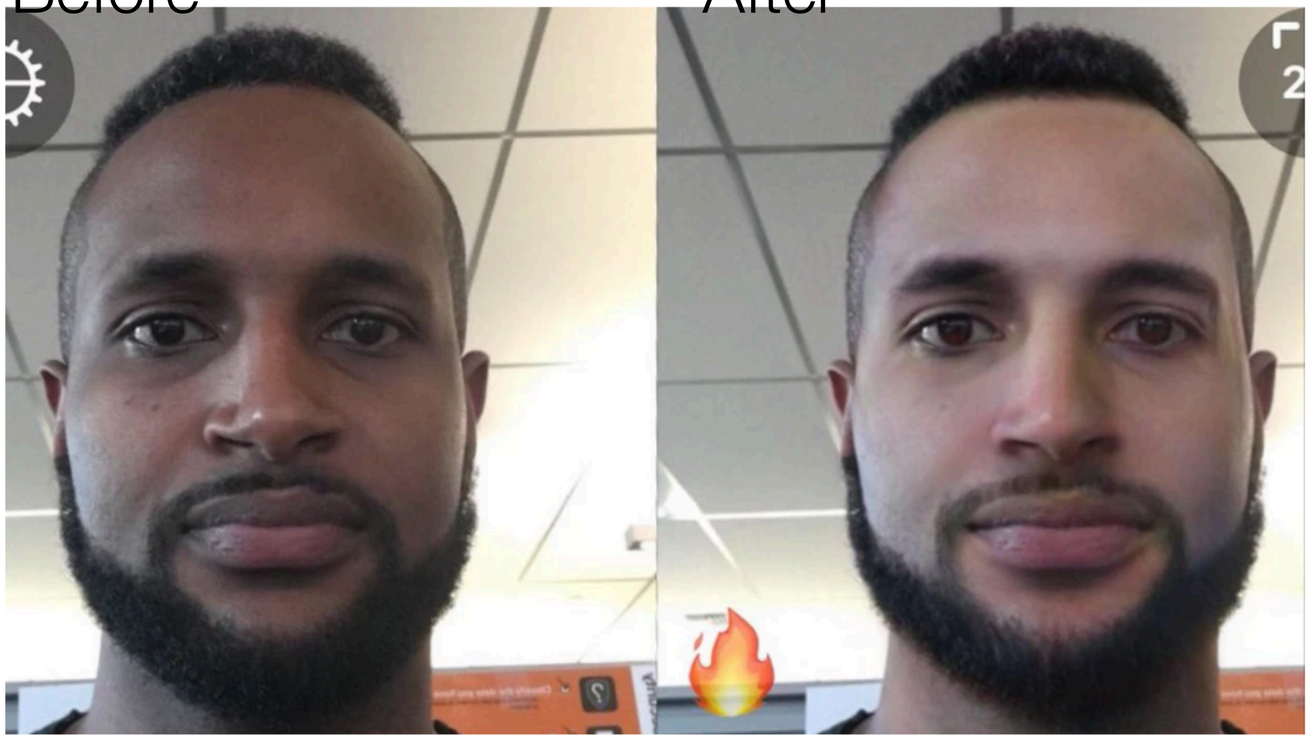
Fredo Durand
MIT EECS & CSAIL

Fairness, whiteness

- https://www.vice.com/en_us/article/qkqwxp/that-viral-faceapp-is-making-everyone-look-whiter?fbclid=IwAR152sG0Gb2aYWC-V6zOD_XXuAEN_VnkGcOLjk7ktkNIJT36Fh-MYxVQS3A

Before

After

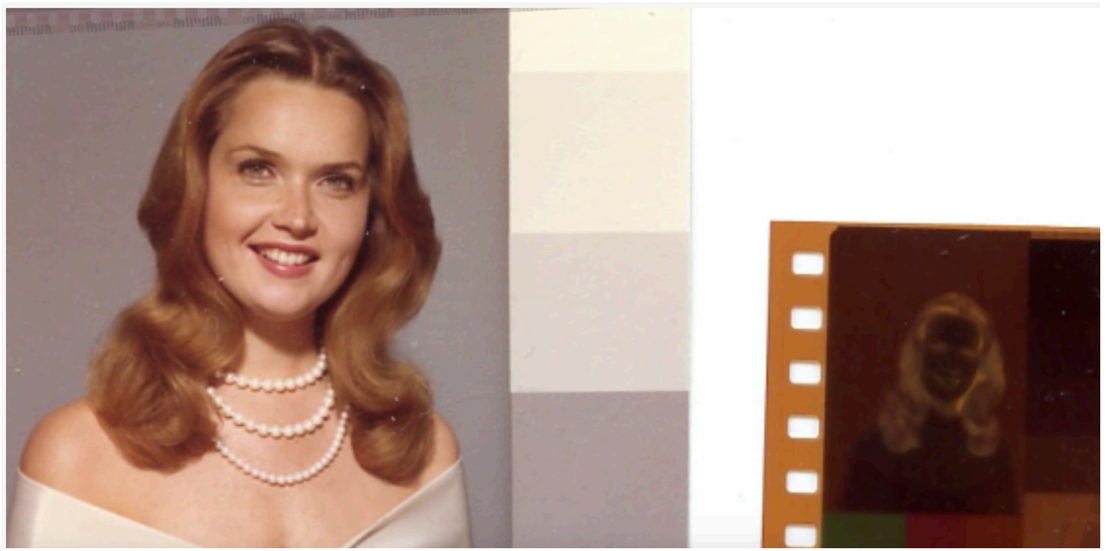


- Do developpers believe whiter is better ? Or just a case of auto-exposure only calibrated for white skin. Not great in either case

- https://petapixel.com/2022/02/16/nfl-players-viral-photo-shows-need-for-googles-skin-tone-camera-tech/
- https://blog.photoshelter.com/2022/02/the-moral-imperative-to-photograph-race-accurately-and-authentically/
-

An old problem

- https://petapixel.com/2015/09/19/heres-a-look-at-how-color-film-was-originally-biased-toward-white-people/
- https://www.youtube.com/watch?v=d16LNHIEJzs
- https://www.theguardian.com/artanddesign/2013/jan/25/racism-colour-photography-exhibition
- https://create.adobe.com/2017/11/28/_10_tips_for_photographing_darker_skin_tones.html



- https://blog.google/products/pixel/image-equity-real-tone-pixel-6-photos/
- https://skintone.google
- https://www.blog.google/products/search/monk-skin-tone-scale/

Image equity: Making image tools more fair for everyone

As part of Google's Product Inclusion efforts, our teams are building more equitable camera and imaging products for people of color.

Oct 19, 2021 · 3 min read

Florian Koenigsberger
Google Image Equity Lead

Share

Bias in AI

- https://www.nytimes.com/2019/11/19/technology/artificial-intelligence-bias.html
- https://www.nytimes.com/2019/11/15/technology/algorithmic-ai-bias.html

Particularly egregious for use in the criminal system

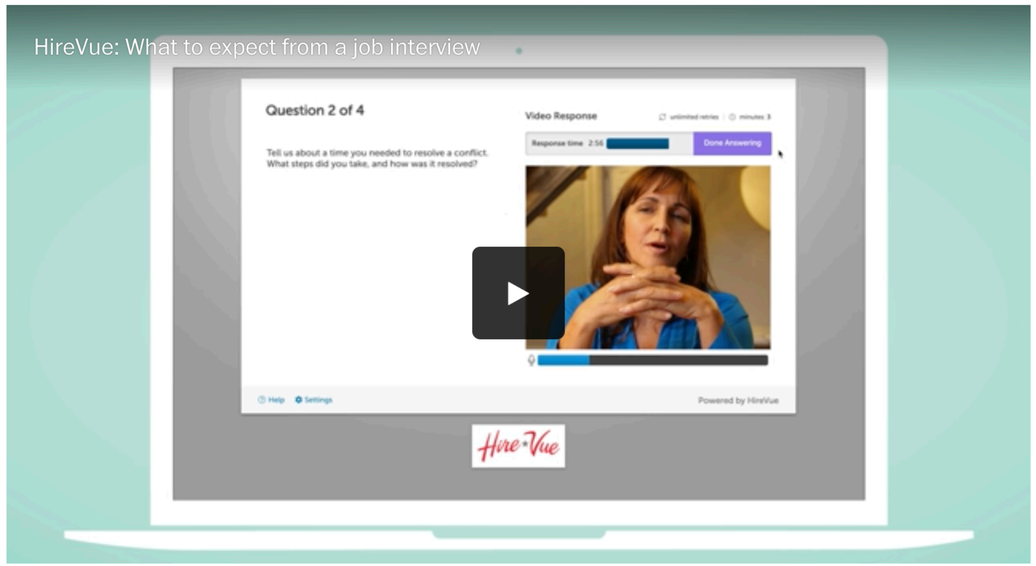
- Not imaging but really important
- https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing
- https://www.propublica.org/article/bias-in-criminal-risk-scores-is-mathematically-inevitable-researchers-say

Also bad for hiring

- https://www.washingtonpost.com/technology/2019/10/22/ai-hiring-face-scanning-algorithm-increasingly-decides-whether-you-deserve-job/

A face-scanning algorithm increasingly decides whether you deserve the job

HireVue claims it uses artificial intelligence to decide who's best for a job. Outside experts call it 'profoundly disturbing.'



Fredo’s take

- Racial, gender and other biases can come from malicious intent or from ignoring people outside a dominant group
- Racial biases in the rendering of skin tones has long been a challenge in photography
- Make sure algorithms work well for everyone
- The problem is especially problematic when algorithms are used for major decisions (job hires, legal outcome, pedestrian avoidance)

Ethics of computational photography

Fredo Durand
MIT EECS & CSAIL

Main ethical issues

- Fake news, propaganda
- Fake beauty
- Fake porn
- Fairness

Other issues

- Photoshop as an excuse
- Sexting & Revenge porn
  - in general too easy to take/search pictures that we will regret
- Censorship and free speech
  - Should objectionable content be (automatically) removed by publishers?
- Selective editing and captioning
- Mass surveillance, bodycams, face recognition
- Bad law enforcement (image) forensics

Context matters

- Law
- Photojournalism
- Science
- Ads
- Fine art
- NSFW

What to do? As a citizen? As a photographer? As a programmer?

- Social norms not to do it
- Detection tools
- Refuse to develop tools
- Refuse to believe photos, educate
- Laws forbidding retouching or deep fake

To develop/release or not to

- OpenAI decided not to release their text model https://openai.com/blog/better-language-models/?fbclid=IwAR3tMwho8XGUrPwGZJXqR5Gwdd2WViO5PzPQ8AquSmqsFeKkO21h2tlA_rE but then they did
- We can also imagine the application of these models for malicious purposes, including the following (or other applications we can't yet anticipate):
- Generate misleading news articles
- Impersonate others online
- Automate the production of abusive or faked content to post on social media
- Automate the production of spam/phishing content
- These findings, combined with earlier results on synthetic imagery, audio, and video, imply that technologies are reducing the cost of generating fake content and waging disinformation campaigns. The public at large will need to become more skeptical of text they find online, just as the "deep fakes" phenomenon calls for more skepticism about images[3]
- Politicians may want to consider introducing penalties for the misuse of such systems, as some have proposed for deep fakes.
- .
- Also some have questioned whether deep fake code should have been released

REDUCING MALICIOUS USE OF SYNTHETIC MEDIA RESEARCH: CONSIDERATIONS AND POTENTIAL RELEASE PRACTICES FOR MACHINE LEARNING

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University of Cambridge
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- https://arxiv.org/pdf/1907.11274.pdf

The aim of this paper is to facilitate nuanced discussion around research norms and practices to mitigate the harmful impacts of advances in machine learning (ML). We focus particularly on the use of ML to create "synthetic media" (e.g. to generate or manipulate audio, video, images, and text), and the question of what publication and release processes around such research might look like, though many of the considerations discussed will apply to ML research more broadly. We are not arguing for any specific approach on when or how research should be distributed, but instead try to lay out some useful tools, analogies, and options for thinking about these issues.

We begin with some background on the idea that ML research might be misused in harmful ways, and why advances in synthetic media, in particular, are raising concerns. We then outline in more detail some of the different paths to harm from ML research, before reviewing research risk mitigation strategies in other fields and identifying components that seem most worth emulating in the ML and synthetic media research communities. Next, we outline some important dimensions of disagreement on these issues which risk polarizing conversations.

Finally, we conclude with recommendations, suggesting that the machine learning community might benefit from: working with subject matter experts to increase understanding of the risk landscape and possible mitigation strategies; building a community and norms around understanding the impacts of ML research, e.g. through regular workshops at major conferences; and establishing institutions and systems to support release practices that would otherwise be onerous and error-prone.

- https://aiforsocialgood.github.io/neurips2019/accepted/track2/pdfs/18_aisg_neurips2019.pdf

The tension between openness and prudence in responsible AI research

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Leverhulme Centre for the Future of Intelligence
University of Cambridge

Aviv Ovadya
The Thoughtful Technology Project

Abstract

This paper explores the tension between openness and prudence in AI research, evident in two core principles of the Montréal Declaration for Responsible AI. While the AI community has strong norms around open sharing of research, concerns about the potential harms arising from misuse of research are growing, prompting some to consider whether the field of AI needs to reconsider publication norms. We discuss how different beliefs and values can lead to differing perspectives on how the AI community should manage this tension, and explore implications for what responsible publication norms in AI research might look like in practice.

- Making deepfake tools doesn’t have to be irresponsible. Here’s how.

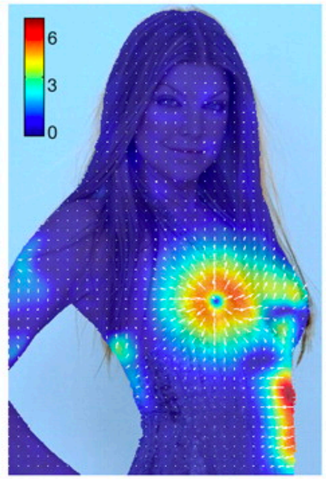
- https://www.technologyreview.com/s/614912/ethical-deepfake-tools-a-manifesto/

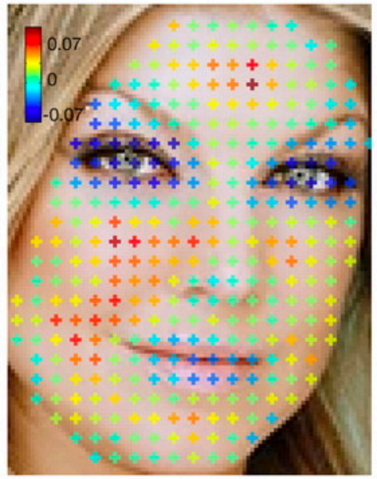
Some issues are subtle and face programmers/camera makers

- Denoising vs skin retouching
- White balance vs whitening
- Exposure vs whitewashing
- Excessive Tone mapping
- Wide angle distortion correction vs. beautification

A perceptual metric for photo retouching

- https://www.pnas.org/content/108/50/19907
- Eric Kee and Hany Farid
- Spatial and color manipulation





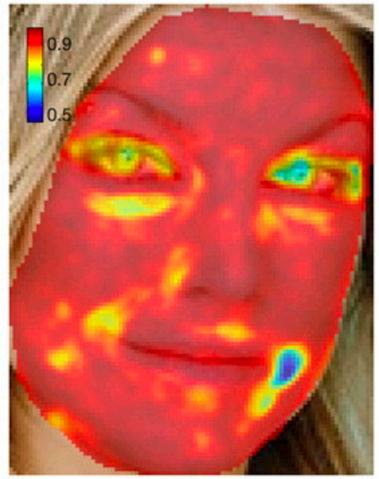
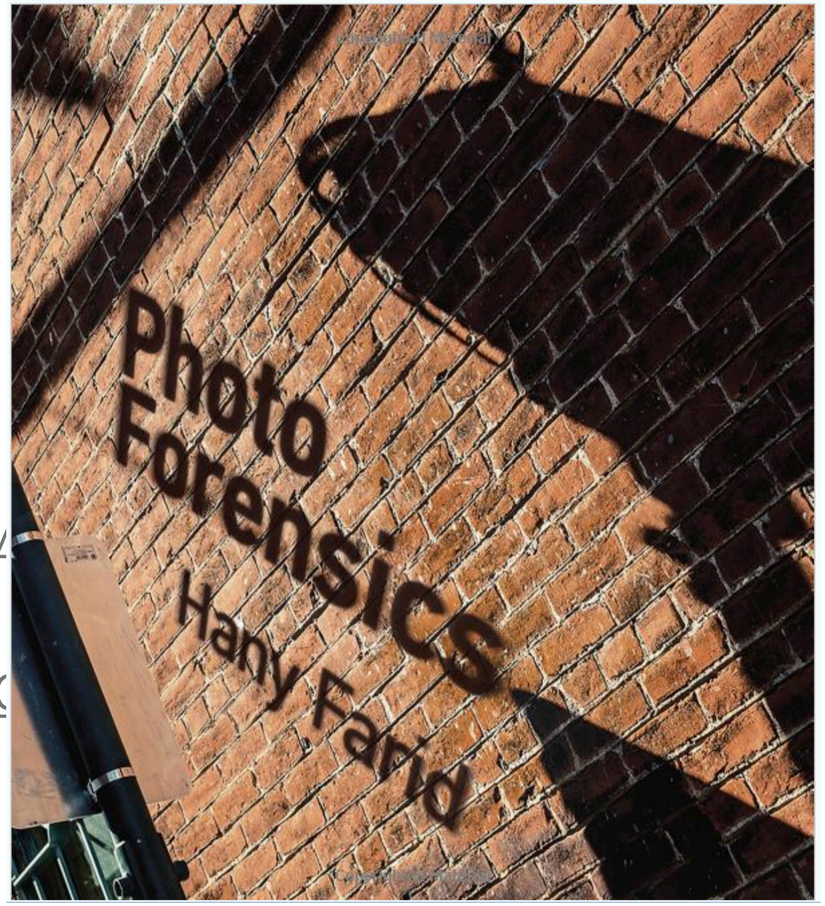


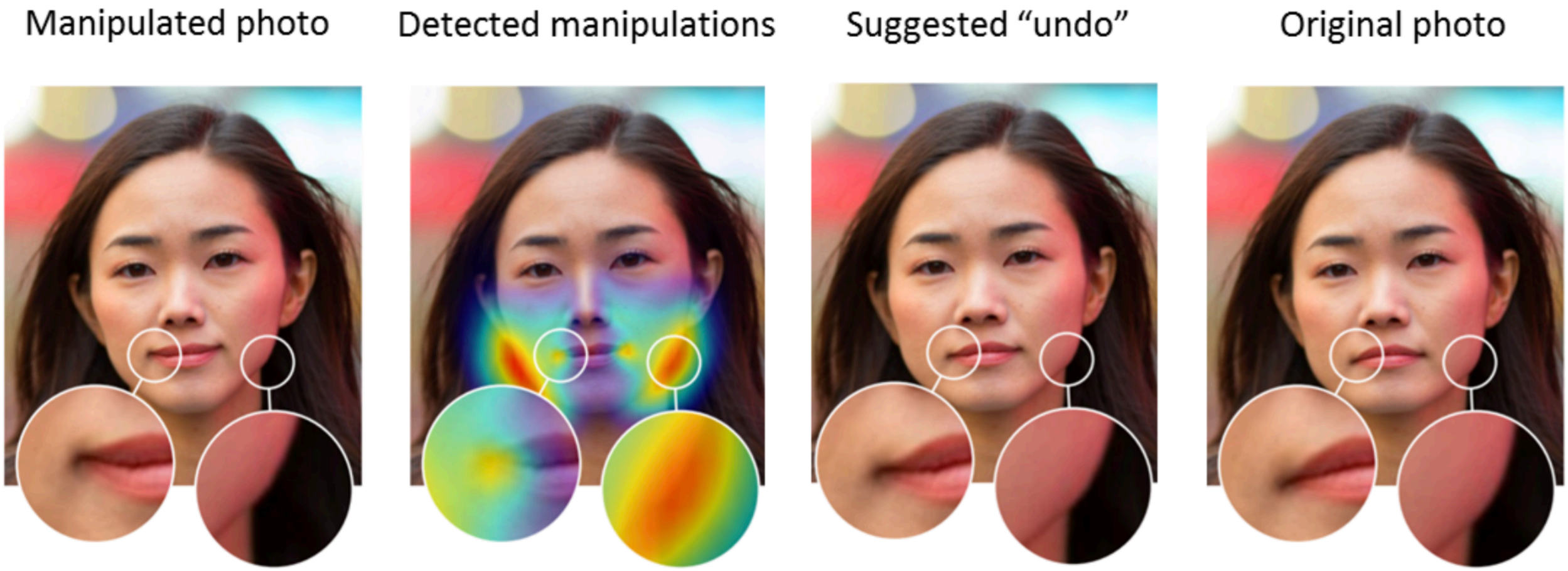
Photo forensics

- https://farid.berkeley.edu/
- Detect alterations
  - e.g. clone brush, inconsistent lighting, inconsistent noise
- http://users.umiacs.umd.edu/~sirius/CVPR_MF_Web/
- https://www.cnn.com/2019/04/26/tech/ai-deepfake-c
  index.html?



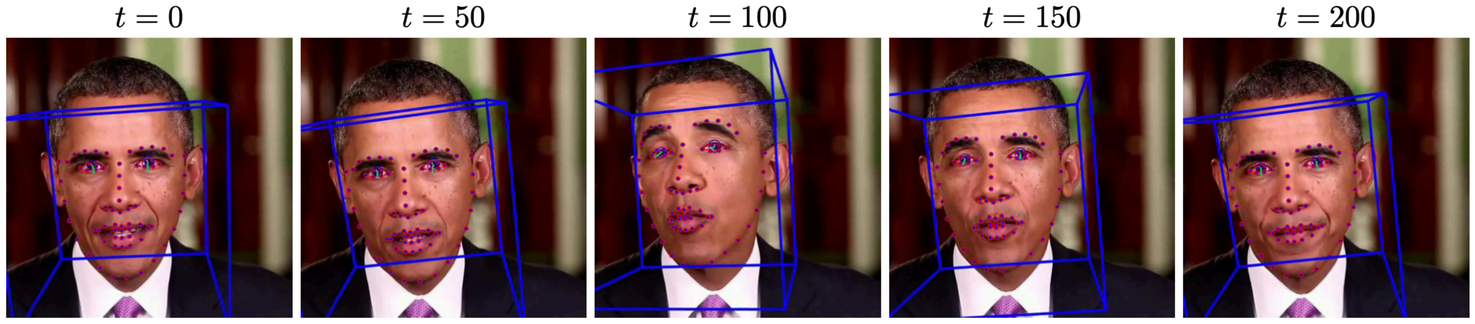
Liquify detection

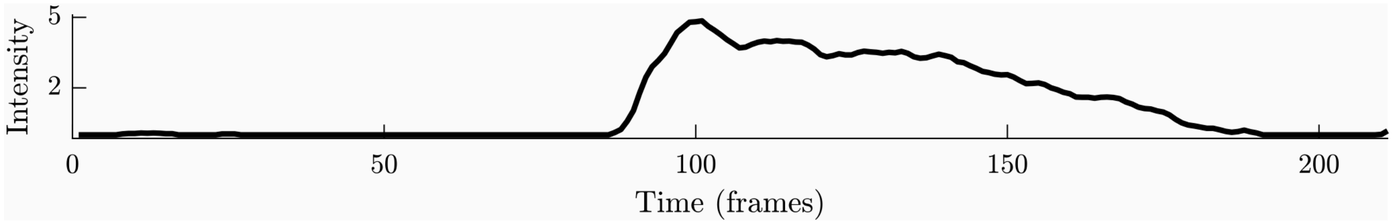
- https://peterwang512.github.io/FALdetector/ by Richard Zhang et al.



Detecting Deep fakes

- https://ai.facebook.com/blog/deepfake-detection-challenge/
- https://ai.googleblog.com/2019/09/contributing-data-to-deepfake-detection.html
- http://www.hao-li.com/publications/papers/cvpr2019workshopsPWLADF.pdf





“Watermarking”

- Can we tag and certify photos?
- Attach the history of edits?

Law

- https://www.pixelz.com/blog/photoshop-models-laws/
- US: FTC and truth in advertising
- Photoshop Law in Israel which requires models to be 18.5 BMI and for advertisers to label retouched images
- France, a law that went into effect in October of 2017 requires a "photographie retouchée" label on photos that have been digitally altered to make a model's silhouette narrower or wider; it also requires an every other year health exam for models, to medically certify they are healthy enough to work.

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- https://www.theverge.com/2019/3/5/18251736/deepfake-propaganda-misinformation-troll-video-hoax?fbclid=IwAR1p-jXNkOXg3WQF42JQgTXIbEYvIFMC975yHyjnPwsgDV7d8EKOn36bs4I
- https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3213954&fbclid=IwAR2r4haS35bazEjuXMe65chiGvLA2JJ52CYUfvia3w7AIYI2wXCPBcbCqNc
- https://www.manrepeller.com/2018/08/the-ethics-of-photoshop-and-retouching.html
- http://www.bbc.com/future/story/20170629-the-hidden-signs-that-can-reveal-if-a-photo-is-fake
- https://www.nytimes.com/2012/07/21/arts/magazine-editors-and-photographers-on-retouching-photos.html
- https://www.pixelz.com/blog/photoshop-models-laws/
- https://lens.blogs.nytimes.com/2015/02/17/world-press-photo-manipulation-ethics-of-digital-photojournalism/
- https://www.digitalethics.org/essays/faking-photos-ethics-photo-manipulation
- https://petapixel.com/2017/04/03/the-ethics-of-photojournalism/
- https://streetbounty.com/the-three-dimensions-of-photojournalism/
- http://web.mit.edu/drb/Public/PhotoThesis/
- https://www.popphoto.com/american-photo/processing-news-retouching-photojournalism#page-7
- https://medium.com/vantage/7-with-vii-ethics-in-photojournalism-7773d03a0aa4
- http://photo-journalisme.org/en/ethics/
- http://www.mediahelpingmedia.org/training-resources/editorial-ethics/527-editorial-ethics-for-photojournalists
- https://en.wikipedia.org/wiki/On_Photography
- http://www.errolmorris.com/media/general/Seeingexcerpt.pdf?fbclid=IwAR22xwfO8aEJtpCwbRuR3OiA3BBGf8-O5Y4N6TARv_Hr8qRp6RorgkSLiqI
- http://www.jamesoberg.com/vanishing_cosmonauts_with_photos.pdf?fbclid=IwAR3f_xHFPb20XHuKDCV--Cb9y49uvJmQaxRBQHAtDK47gwBsvEajigOH9EU
- https://petapixel.com/2019/05/16/this-microbiologist-can-spot-your-fake-images/
- https://www.nytimes.com/2019/04/25/lens/sarah-lewis-racial-bias-photography.html
- https://en.wikipedia.org/wiki/Potter_Box
- https://petapixel.com/2019/05/11/are-you-an-ethical-photographer/
- https://www.vox.com/the-highlight/2019/5/22/18273284/ai-algorithmic-bill-of-rights-accountability-transparency-consent-bias

Lesson plans, student activities to discuss ethics and photography

- http://people.vcu.edu/~ogiere/genderartmedia/lesson4.html
- https://www.commonsense.org/education/lesson/retouching-reality-9-12
- http://www.artsandjustice.org/photoshop-ethics-body-image/
- http://people.vcu.edu/~ogiere/genderartmedia/lesson4.html
- https://www.schooljournalism.org/photo-editing-and-photo-ethics/

Acknowledgments

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- Bryan Russell
- Marc Levoy
- Hao Li
- Francois Sillion
- Chris Bregler
- Abe Davis
- Neva Durand
- Alyosha Efros

OTHER ISSUES

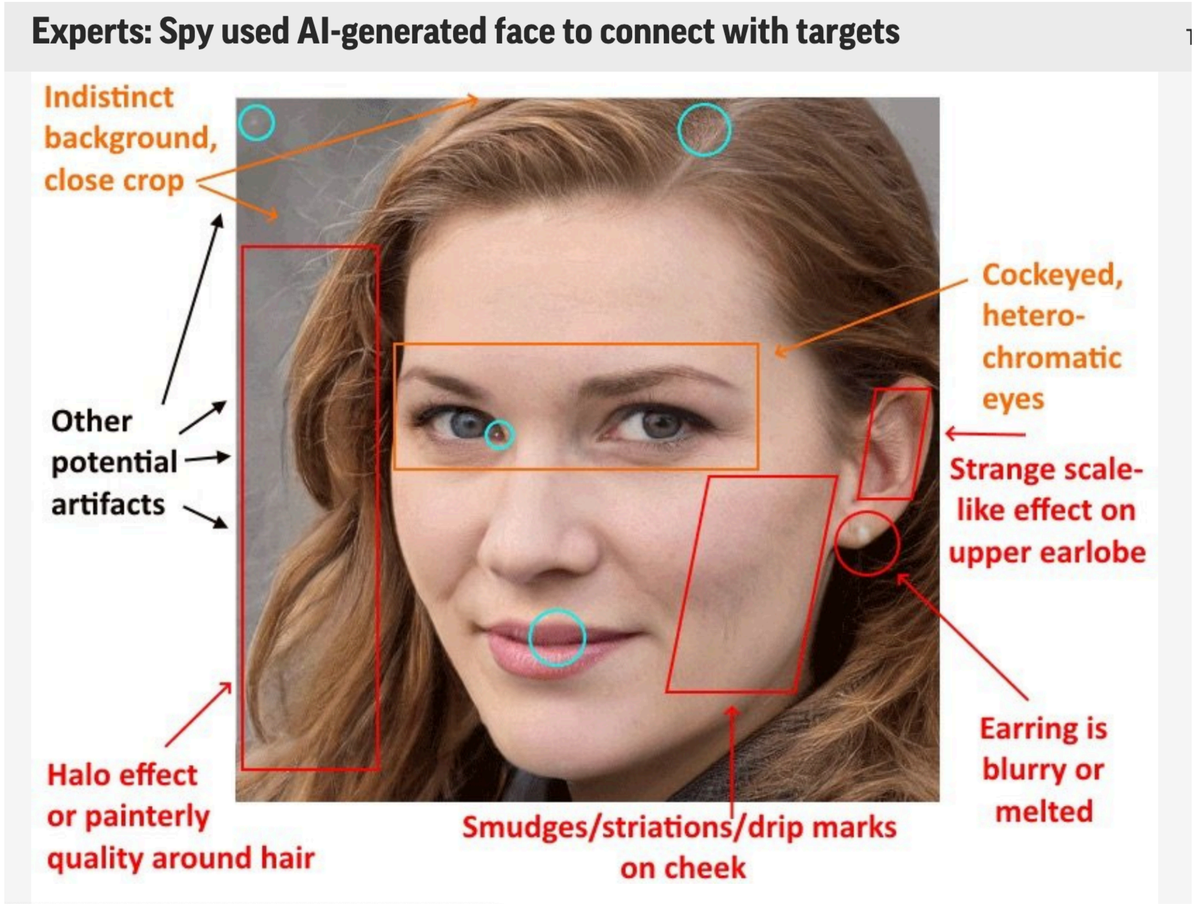
Fredo Durand
MIT EECS & CSAIL

Making images out of nothing

- https://github.com/tkarras/progressive_growing_of_gans
- https://www.youtube.com/watch?v=G06dEcZ-QTg&feature=youtu.be
- https://generated.photos/

Fake identities

- https://apnews.com/bc2f19097a4c4fffaa00de6770b8a60d?fbclid=IwAR1GMuBk92VVdQqHq477ICcpI4bNpbmktYfXb1EdzsOLa-eQOZeM8ICfnaM



Law

- **Under the “pictorial testimony” theory, photographic evidence is admissible when a sponsoring witness can testify that it is a fair and accurate representation of the subject matter.**

- Currently, the admissibility of photographic evidence is based on two different theories. Under the “pictorial testimony” theory, photographic evidence is admissible when a sponsoring witness can testify that it is a fair and accurate representation of the subject matter. It is important to note, this theory is based on the personal observation(s) of the witness. Under the “silent witness” theory, photographic evidence is admissible if the process used to produce the photograph is accurate and reputable. This theory speaks for itself, hence the “silent witness” designation.

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- These two theories represent a departure from earlier requirements, which required authenticating testimony from the photographer and/or an expert witness regarding the reliability of the recording process. Notwithstanding the ease with which photographs or videos may now be introduced into evidence, a trial judge may still require expert testimony. For example, when a defense seeks to minimize the injury to the plaintiff’s person by showing minor injury to the vehicle via photographs, expert testimony may be required. Thus, before photographic evidence is used at trial, the trial attorney must consider the purpose of the photographic evidence and the need for expert testimony.

- https://www.lexology.com/library/detail.aspx?g=8451aeb6-b353-47af-920d-badbdba86906

Images and the Law

- http://illinoisjltp.com/journal/wp-content/uploads/2013/10/Parry2.pdf
- https://via.library.depaul.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=3747&context=law-review
- https://www.popsci.com/recidivism-algorithm-random-bias
- https://www.sciencefriday.com/segments/do-predictive-algorithms-have-a-place-in-public-policy/
-

College admissions

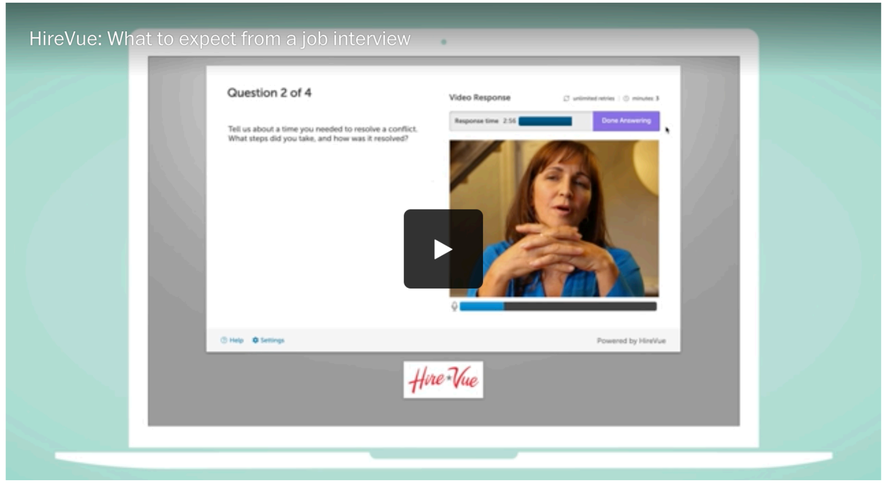
Not a real fake

- https://www.washingtonpost.com/technology/2019/10/22/ai-hiring-face-scanning-algorithm-increasingly-decides-whether-you-deserve-job/

- https://www.vox.com/recode/2019/12/12/20993665/artificial-intelligence-ai-job-screen

A face-scanning algorithm increasingly decides whether you deserve the job

HireVue claims it uses artificial intelligence to decide who's best for a job. Outside experts call it 'profoundly disturbing.'



Emotion recognition

- https://www.technologyreview.com/f/614932/emotion-recognition-technology-should-be-banned-says-ai-research-institute/?utm_campaign=site_visitor.unpaid.engagement&utm_medium=tr_social&utm_source=Facebook#Echobox=1576246957

- https://fstoppers.com/news/north-face-caught-gaming-wikipedia-after-they-bragged-about-it-378165

Law enforcement

- https://www.theverge.com/2019/5/16/18627548/nypd-facial-recognition-altered-faces-privacy

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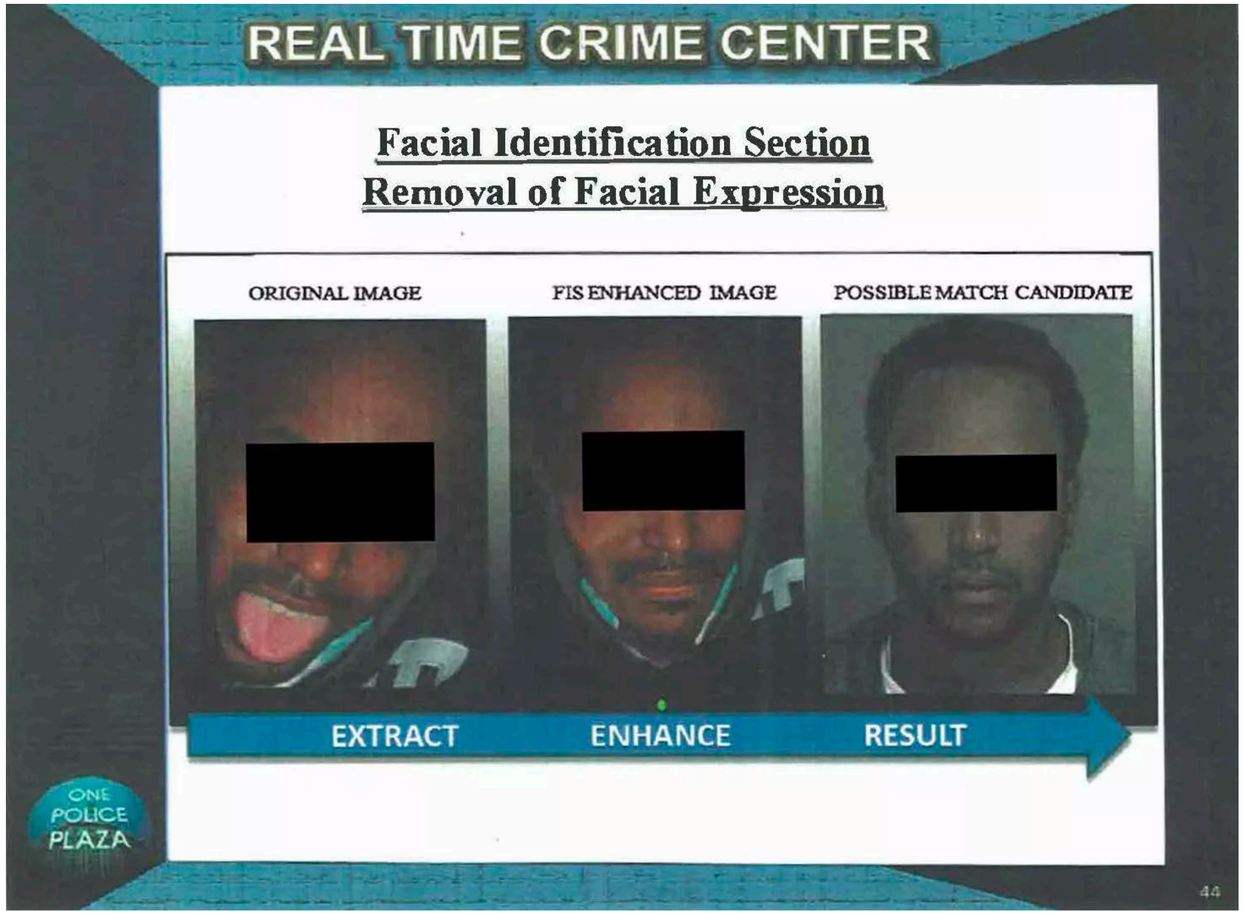

AI to detect sexual orientation

- https://www.economist.com/science-and-technology/2017/09/09/advances-in-ai-are-used-to-spot-signs-of-sexuality?fsrc=scn/fb/te/bl/ed/advancesinaiareusedtospotsignsofsexualityfacialtechnology&fbclid=IwAR1HpCd8cS7RucPb5Xb6-H2TQ0OEvqBJxTSkMwEIOZHkA81LAg0MM08YrCI

Free speech, hate speech, online radicalization

- https://www.neweurope.eu/article/internet-companies-complicit-promoting-hateful-harmful-content/
- https://thehill.com/blogs/pundits-blog/technology/350118-internet-companies-right-to-close-neo-nazi-sites-but-terror
- https://thehill.com/blogs/congress-blog/technology/439306-tech-companies-must-act-to-stop-horrific-exploitation-of-their

- Same visuals, different commentary (town?) visions of light? Other dvd?
- Tabloid, same photo series, different conclusions about couple

- https://generated.photos/
- https://www.technologyreview.com/s/614446/deepfake-technology-detection-disinformation-harassment-revenge-porn-law/?utm_campaign=site_visitor.unpaid.engagement&utm_medium=tr_social&utm_source=LinkedIn#Echobox=1570026603
- https://deeptracelabs.com/about/
- https://www.nytimes.com/interactive/2019/10/11/technology/flickr-facial-recognition.html?action=click&module=Top%20Stories&pgtype=Homepage
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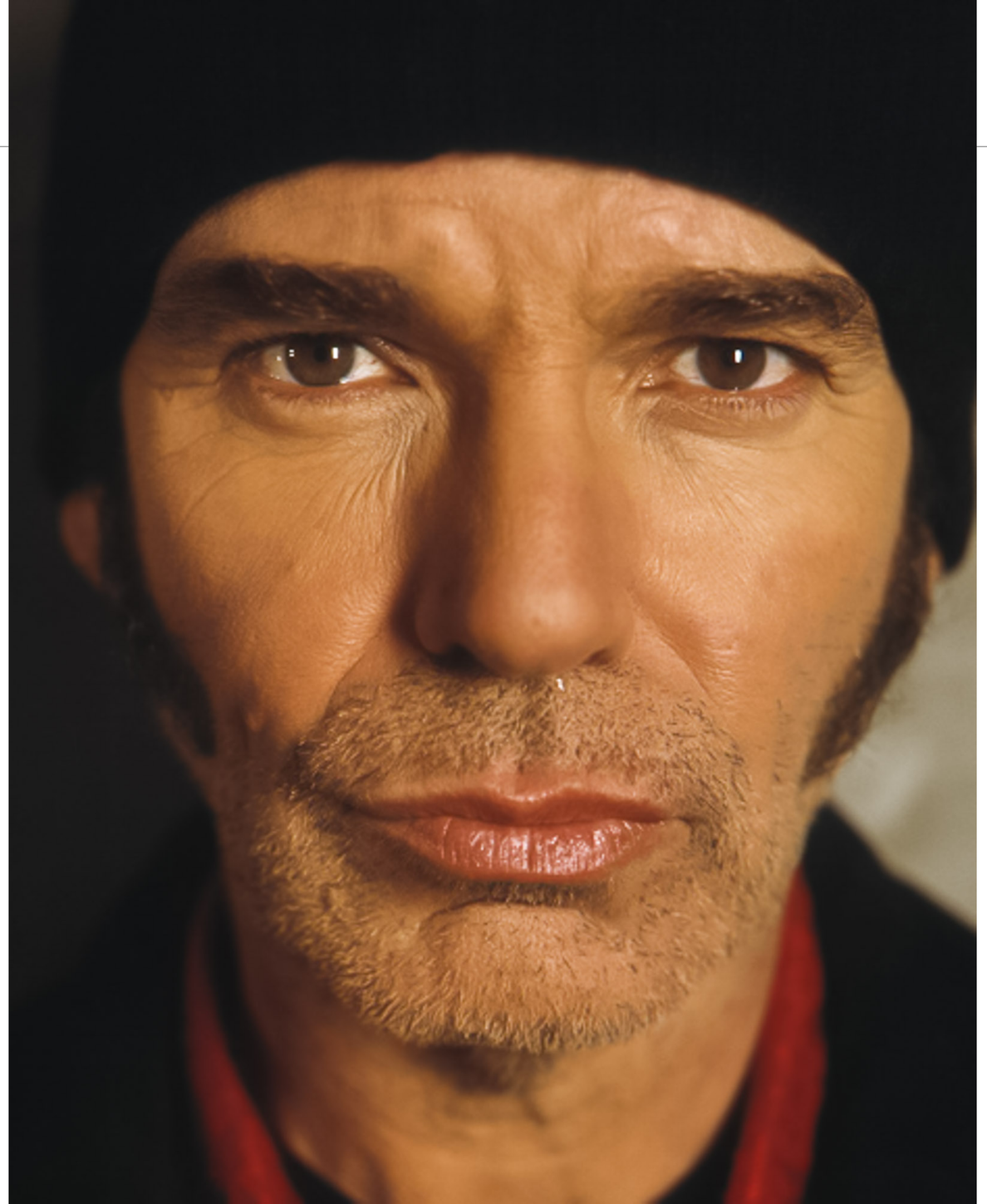
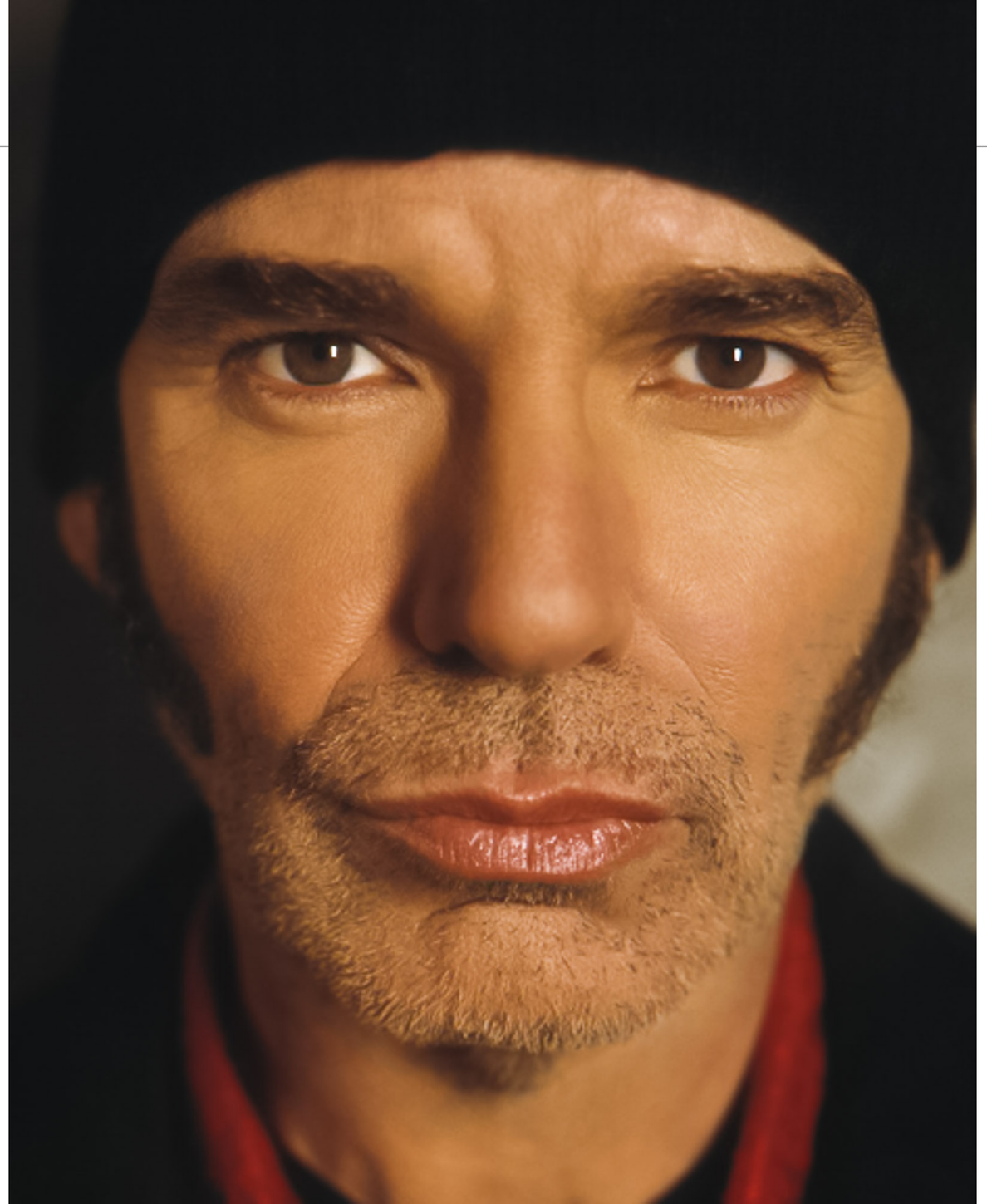
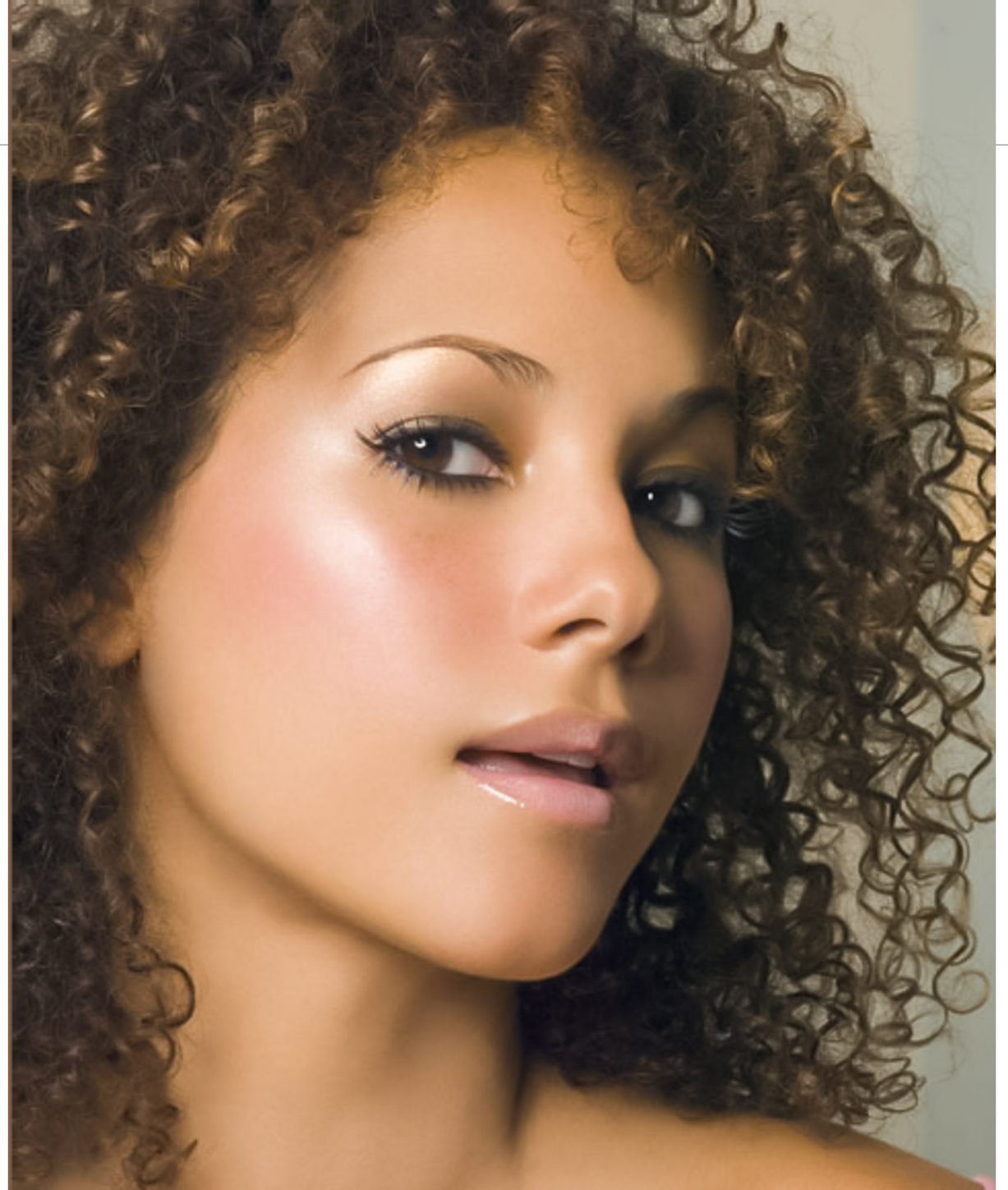
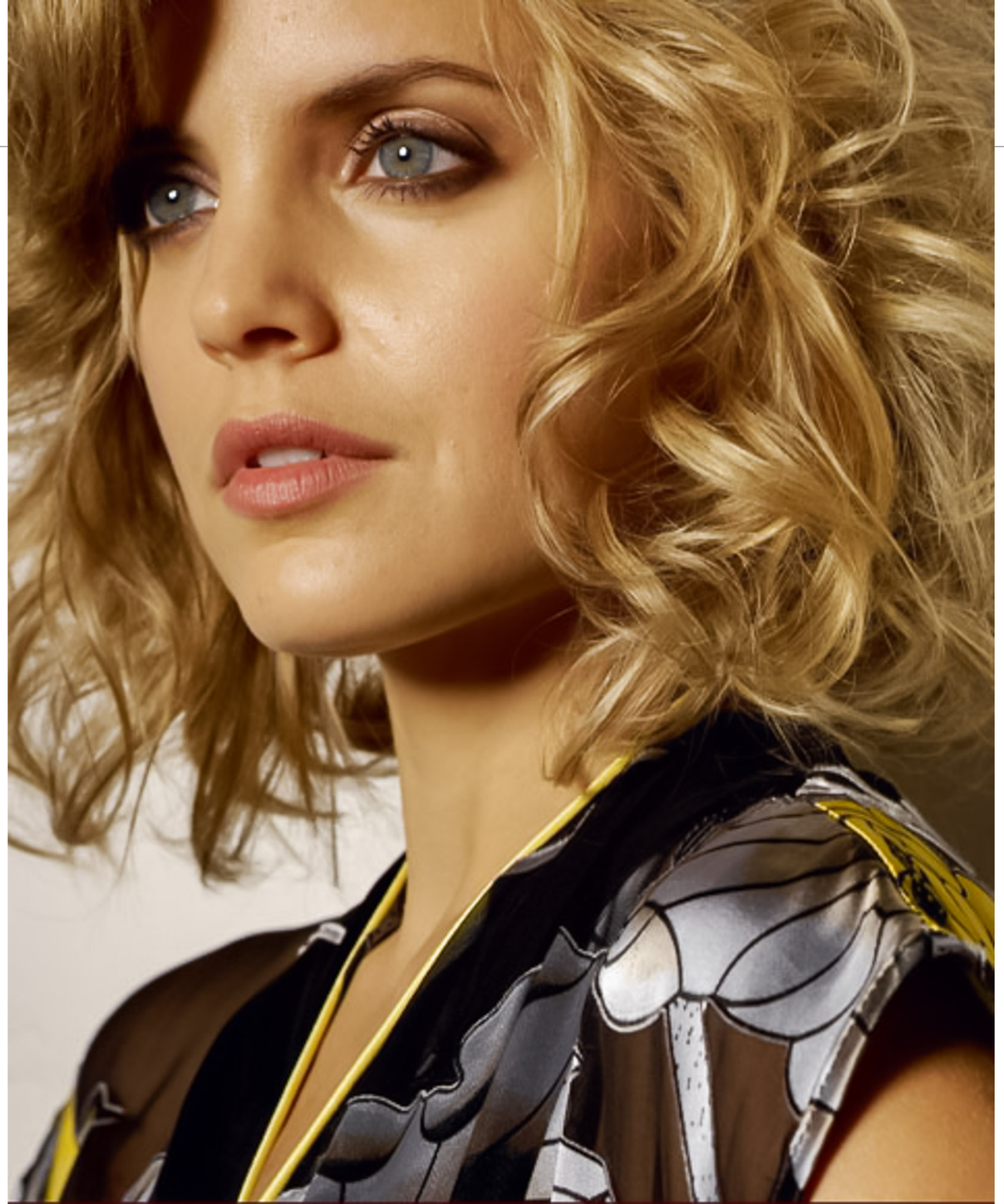
More BEFORE/AFTER Photoshop (from fluideffect)

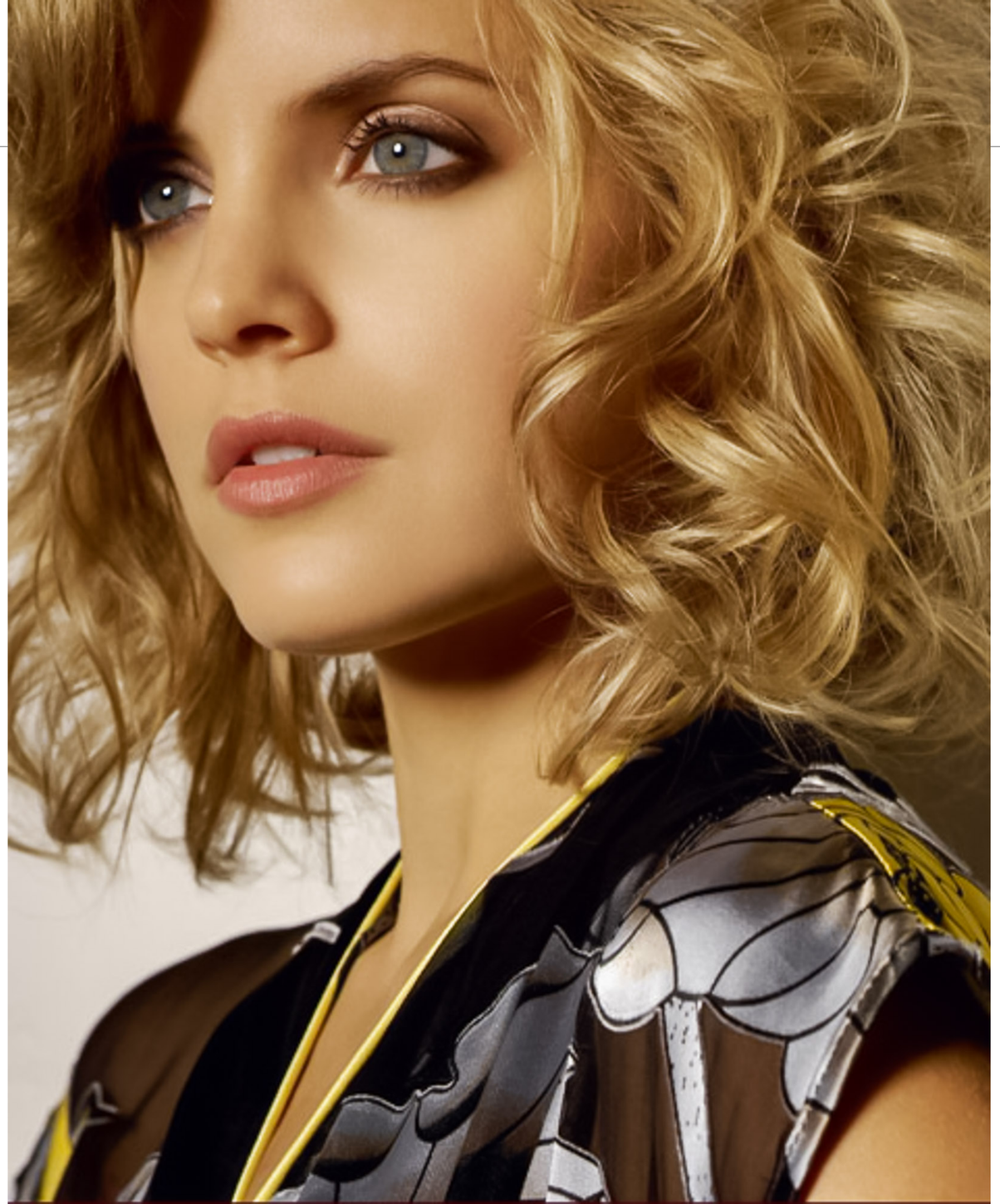
Fredo Durand
MIT EECS & CSAIL

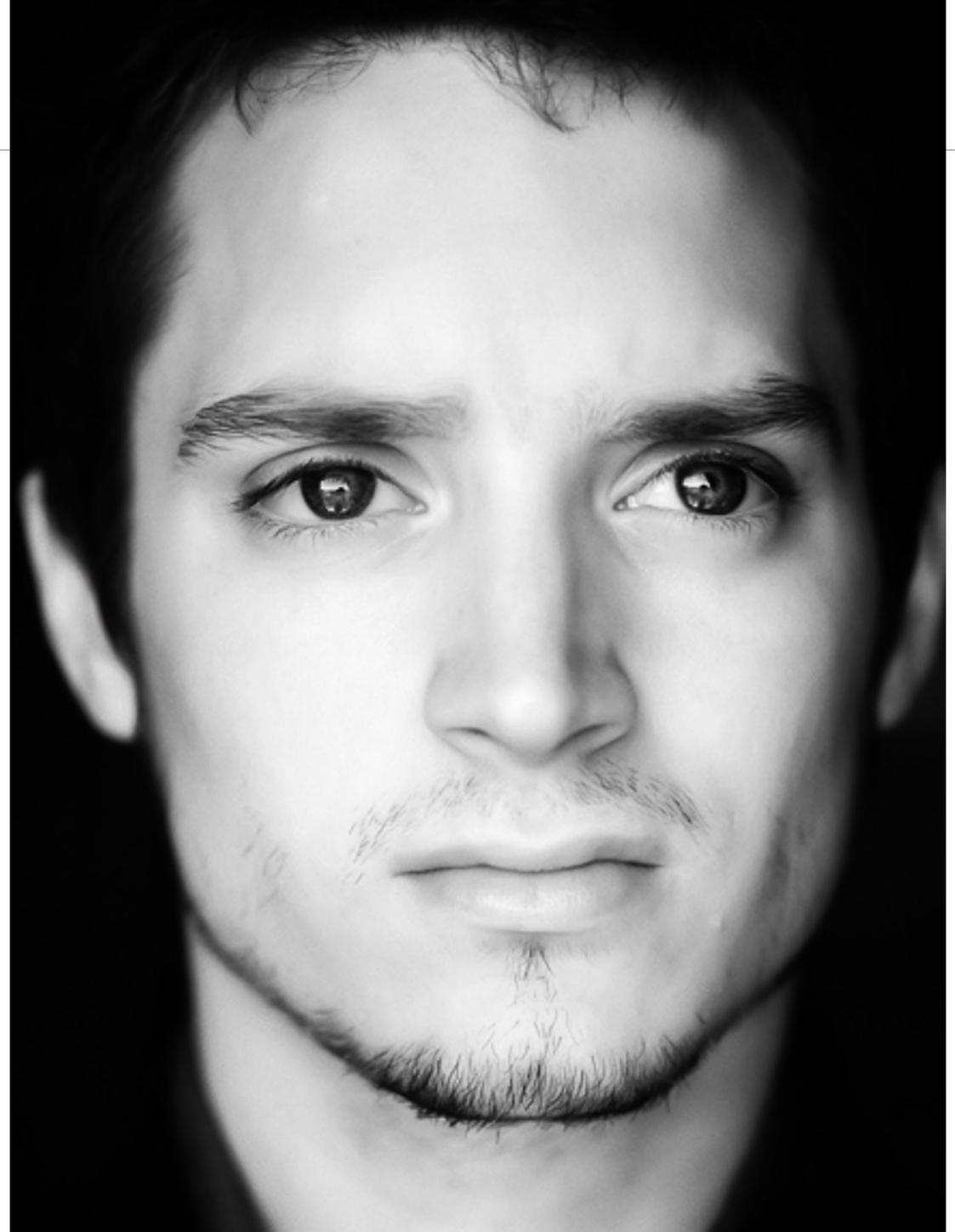


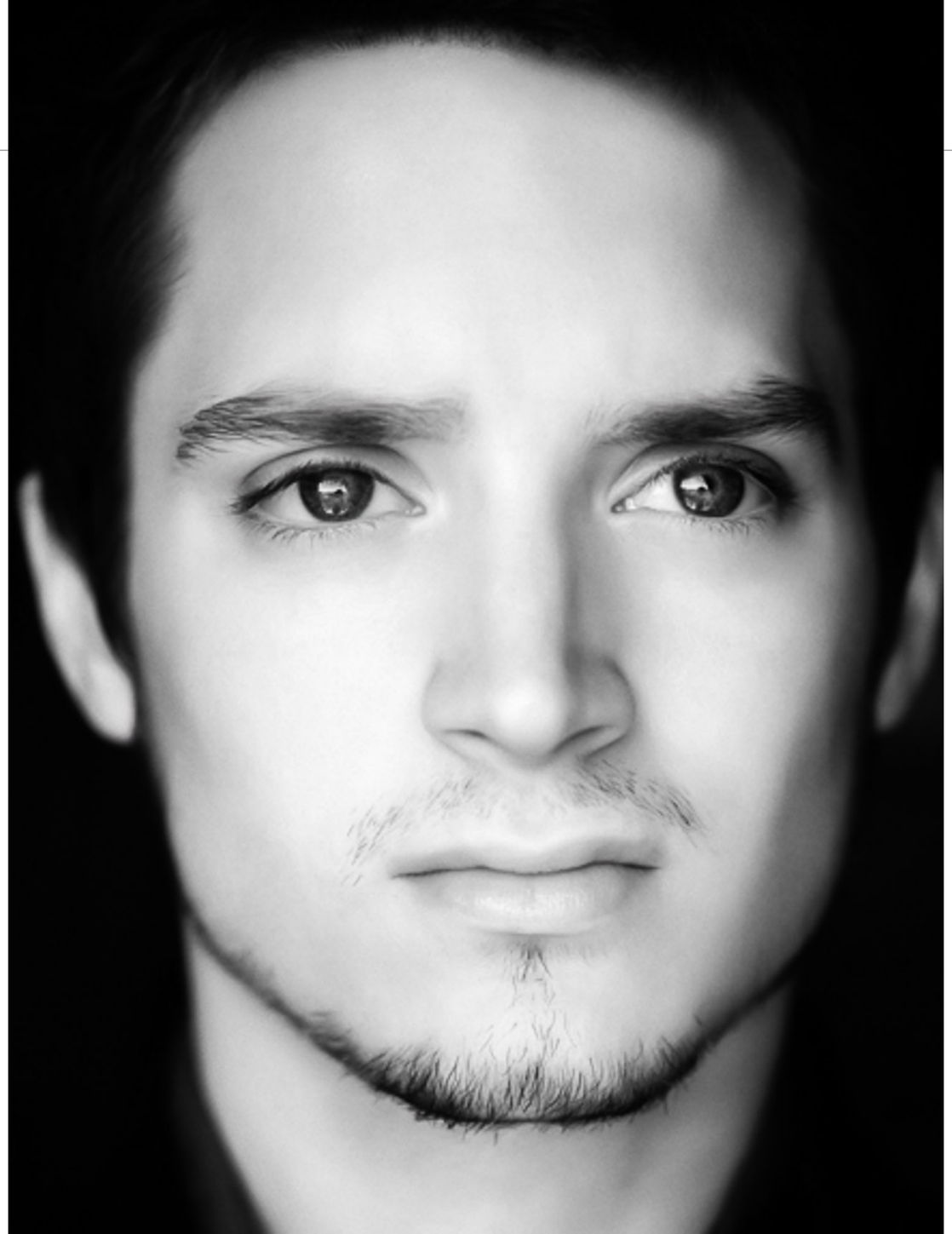












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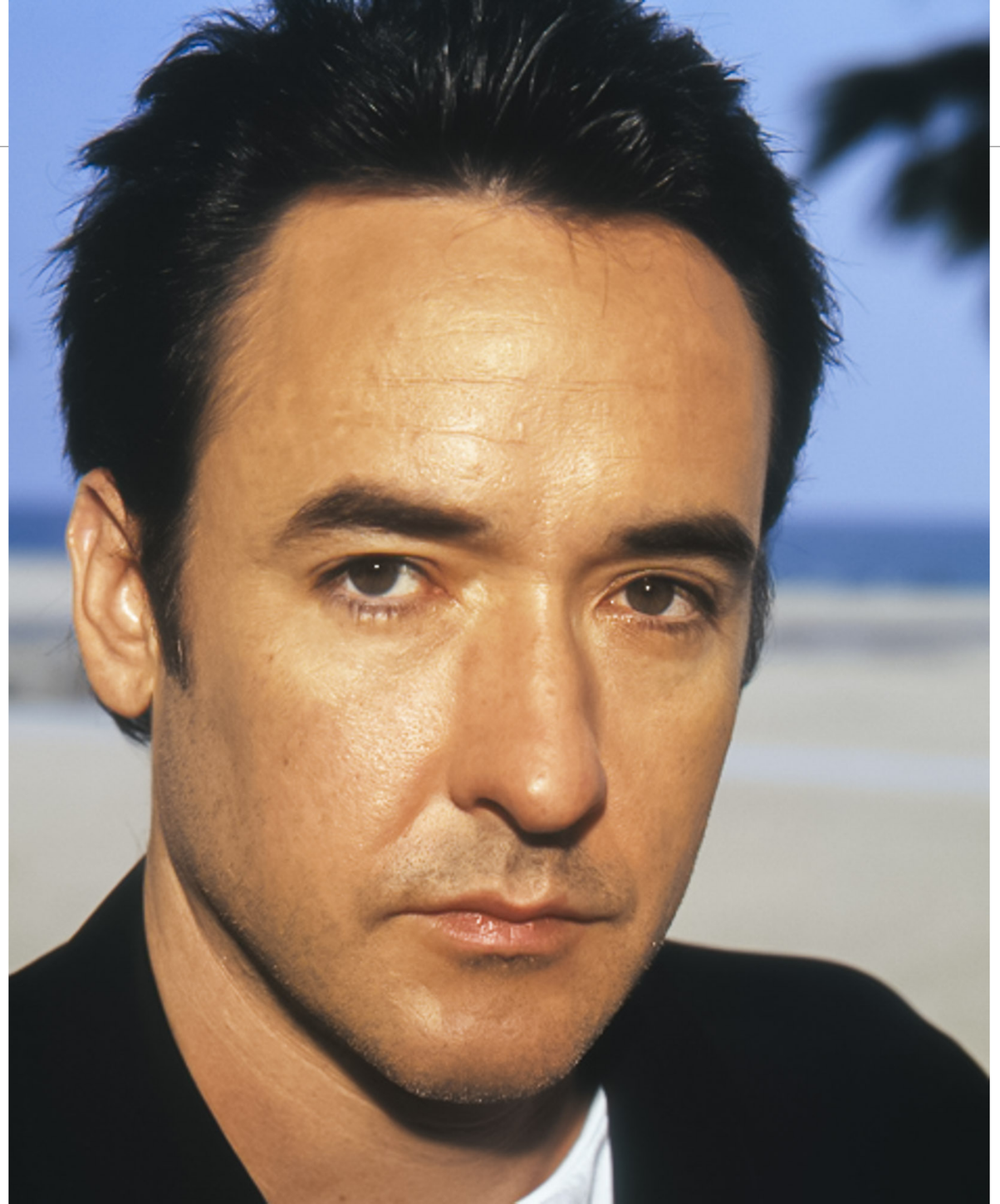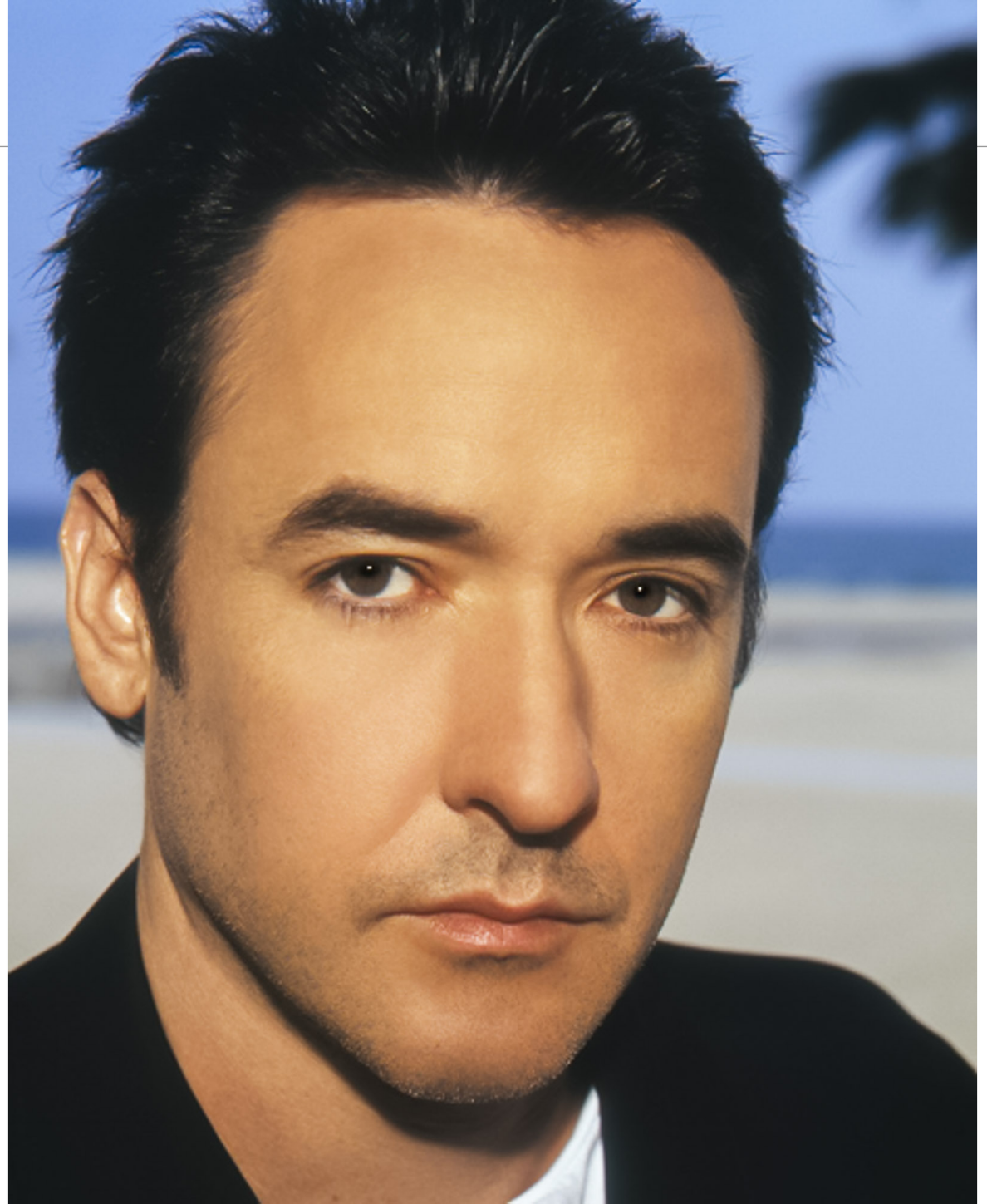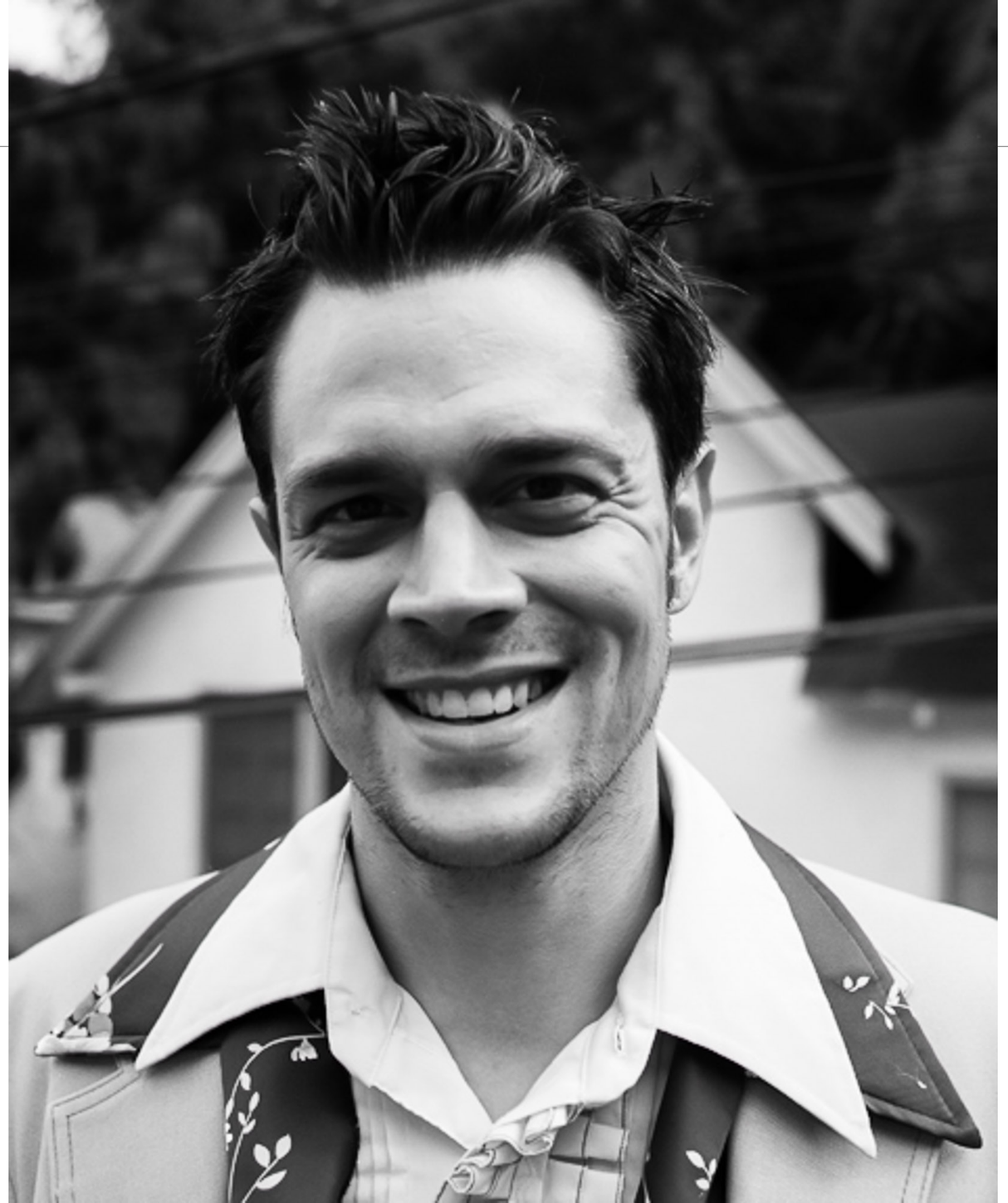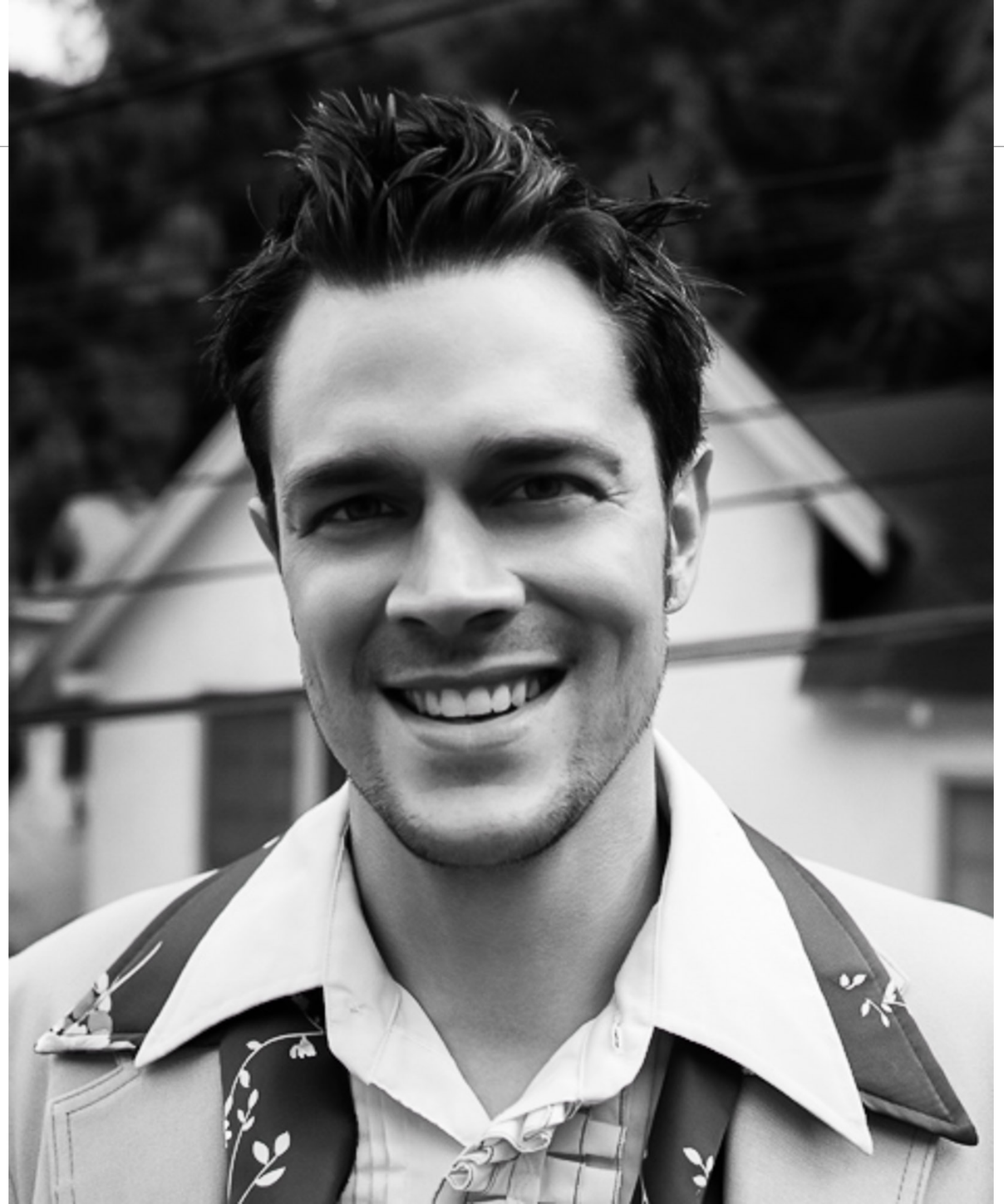
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