

# Hany Farid

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APPOINTMENTS	<b>University of California at Berkeley</b> <i>Professor, School of Information</i> <i>Professor, Electrical Engineering and Computer Science</i>	2019 –
	<b>Dartmouth College, Department of Computer Science</b> <i>Albert Bradley 1915 Third Century Professor</i> <i>Professor</i> <i>William H. Neukom 1964 Distinguished Professor of Computational Science</i> <i>David T. McLaughlin Distinguished Professor of Computer Science</i> <i>Professor</i> <i>Associate Professor</i> <i>Assistant Professor</i>	1999 – 2019 2016 – 2019 2011 – 2016 2008 – 2011 2007 – 2008 2006 – 2007 2004 – 2006 1999 – 2004
	<b>Dartmouth College, Tuck School of Business</b> <i>Adjunct Professor of Business Administration</i>	2016 – 2019
	<b>Dartmouth College, Neukom Institute for Computational Science</b> <i>Director</i>	2008 – 2011
PROFESSIONAL	<b>Office of the Prosecutor, International Criminal Court</b> <i>Technology Advisory Board, Member</i>	2018 – present
	<b>Counter Extremism Project</b> <i>Senior Adviser</i>	2016 – present
	<b>Fourandsix Technologies, Inc.</b> <i>Chief Technology Officer and Co-founder</i>	2011 – present
EDUCATION	<b>Massachusetts Institute of Technology</b> <i>Postdoctoral Fellow, Brain and Cognitive Sciences (adviser: Ted Adelson)</i>	1997 – 1999
	<b>University of Pennsylvania</b> <i>Ph.D., Computer Science (adviser: Eero Simoncelli)</i>	1993 – 1997
	<b>State University of New York at Albany</b> <i>M.S., Computer Science</i>	1990 – 1992
	<b>University of Rochester</b> <i>B.S., Computer Science with Applied Mathematics</i>	1984 – 1988
AWARDS	National Academy of Inventors (NAI), Fellow, 2016 John Simon Guggenheim Fellowship, 2006 Alfred P. Sloan Fellowship, 2002	
FUNDING	DARPA. <i>Photons, Pixels, Photoshop and the Internet</i> , (929K), Co-PI, 2016 National Institute of Justice. <i>Degrade It</i> , (124K), 2016 Microsoft Corp. <i>Combating On-line Extremism</i> , 2016 NVIDIA Corp. <i>How Realistic is Photorealistic?</i> , (Equipment Grant), 2015 National Science Foundation. <i>GridIron</i> (474K), Co-PI, 2012 National Science Foundation. <i>Instrument Development for Biological Research</i> (212K), Co-PI, 2008 National Science Foundation. <i>Digital Imaging Laboratory at Dartmouth</i> (427K), 2007 Department of Homeland Security. <i>Digital Video Forensics</i> (255K), 2007 Howard Hughes Medical Institute. <i>Undergraduate Science Education</i> (1.5M), Co-PI, 2006 United States Air Force. <i>Digital Image Forensics</i> (380K), 2006 National Science Foundation. <i>The Evolution of Mate Choice in Damselflies</i> (535K), Co-PI, 2005 Bureau of Justice Assistance. <i>Digital Image Forensics</i> (125K), 2005 Microsoft Corp. (375K), 2005, 2006, 2007, 2009, 2016 Adobe Systems, Inc. (110K), 2004, 2006, 2008 National Institute of Justice. <i>Digital Tampering and Secrets</i> (690K), 2003 National Institute of Justice. <i>Detecting Digital Tampering</i> (250K), 2000 National Science Foundation. <i>CAREER: Mixing and Separating Digital Images</i> (315K), 2000	

- PUBLICATIONS (IMPACT)  $h$ -index=55; total citations=13,254; i500-index=5; i250-index=15; i100-index=39; i10-index=96.<sup>1</sup>
- PUBLICATIONS (BOOK) H. Farid. Photo Forensics, MIT Press, 2016.
- PUBLICATIONS (JOURNAL) H. Farid. Reining in Online Abuses. *Technology and Innovation*, 19(3):593-599, 2018.
- J. Dressel and H. Farid. The Accuracy, Fairness, and Limits of Predicting Recidivism, *Science Advances*, 4(1):eaao5580, 2018.
- B. Mader, M.S. Banks, and H. Farid. Identifying Computer-Generated Portraits: The Importance of Training and Incentives. *Perception*, 46(9):1062-1076, 2017.
- K. Greenham, P. Lou, J.R. Puzey, G. Kumar, C. Arnevik, H. Farid, J. H. Willis, and C.R McClung. Geographic Variation of Plant Circadian Clock Function in Natural and Agricultural Settings. *Journal of Biological Rhythms*, 32(1):26-34, 2016.
- M.J. Bravo and H. Farid. Observers Change their Target Template Based on Expected Context. *Attention, Perception, & Psychophysics*, 78(3):829-837, 2016.
- O. Holmes, M.S. Banks, and H. Farid. Assessing and Improving the Identification of Computer Generated Portraits. *ACM Transactions on Applied Perception*, 13(2):7:1-7:12, 2016.
- E.A. Cooper and H. Farid. Does the Sun Revolve Around the Earth? A Comparison between the General Public and On-line Survey Respondents in Basic Scientific Knowledge. *Public Understanding of Science*, 25(2):146-153, 2016.
- S. Pittala, E. Whiting, and H. Farid. A 3-D Stability Analysis of Lee Harvey Oswald in the Backyard Photo. *Journal of Digital Forensics, Security and Law*, 10(3):87-98, 2015.
- K. Greenham, P. Lou, S. E. Remsen, H. Farid, and C.R McClung. TRiP: Tracking Rhythms in Plants, an automated leaf movement analysis program for circadian period estimation. *Plant Methods*, 11(33):1-11, 2015.
- E. Kee, J. O'Brien, and H. Farid. Exposing Photo Manipulation from Shading and Shadows. *ACM Transactions on Graphics*, 33(5):165:1-165:21, 2014.
- M. Bravo and H. Farid. Informative Cues Can Slow Search: The cost of matching a specific template. *Perception*, 76(1):32-39, 2014.
- E. Kee, J. O'Brien, and H. Farid. Exposing Photo Manipulation with Inconsistent Shadows. *ACM Transactions on Graphics*, 32(4):28:1-12, 2013 (presented at SIGGRAPH).
- D.T. Bolger, T.A. Morrison, B. Vance, D. Lee, and H. Farid. A Computer-Assisted System for Photographic Mark-Recapture Analysis. *Methods in Ecology and Evolution*, 3(5):813-822, 2012.
- J. O'Brien and H. Farid. Exposing Photo Manipulation with Inconsistent Reflections. *ACM Transactions on Graphics*, 31(1):4:1-4:11, 2012 (presented at SIGGRAPH).
- H. Farid and M.J. Bravo. Perceptual Discrimination of Computer Generated and Photographic Faces. *Digital Investigation*, 8:226-235, 2012.
- M.J. Bravo and H. Farid. Task Demands Determine the Specificity of the Search Template. *Attention, Perception, & Psychophysics*, 74(1):124-131, 2012.

<sup>1</sup> $h$ -index = largest number  $h$  such that  $h$  publications have at least  $h$  citations;  $iN$ -index = number of publications with at least  $N$  citations. Citation counts according to GoogleScholar as of June 2018.

- V. Conotter, J. O'Brien, and H. Farid. Exposing Digital Forgeries in Ballistic Motion. *IEEE Transactions on Information Forensics and Security*, 7(1):283-296, 2012.
- E. Kee and H. Farid. A Perceptual Metric for Photo Retouching. *Proceedings of the National Academy of Sciences*, 108(50):19907-19912, 2011.
- E. Kee, M. K. Johnson, and H. Farid. Digital Image Authentication from JPEG Headers. *IEEE Transactions on Information Forensics and Security*, 6(3):1066-1075, 2011.
- H. Farid. The Lee Harvey Oswald Backyard Photos: Real or Fake? *Perception*, 38(11):1731-1734, 2009.
- H. Farid. A Survey of Image Forgery Detection. *IEEE Signal Processing Magazine*, 26(2):16-25, 2009.
- L. Shen, H. Farid and M.A. McPeck. Modeling 3-Dimensional Morphological Structures using Spherical Harmonics. *Evolution*, 63(4):1003-1016, 2009.
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- M.J. Bravo and H. Farid. The Specificity of the Search Template. *Journal of Vision*, 9(1):34, 1-9, 2009.
- M.A. McPeck, L. Shen and H. Farid. The Correlated Evolution of 3-Dimensional Reproductive Structure Between Male and Female Damselies. *Evolution*, 63(1):73-83, 2009.
- M.A. McPeck, L. Shen, J.Z. Torrey and H. Farid. The Tempo and Mode of 3-Dimensional Morphological Evolution in Male Reproductive Structures. *American Naturalist*, 171(5):E158-E178, 2008.
- M.J. Bravo and H. Farid. A Scale Invariant Measure of Image Clutter. *Journal of Vision*, 8(1):1-9, 2008.
- M.K. Johnson and H. Farid. Exposing Digital Forgeries in Complex Lighting Environments. *IEEE Transactions on Information Forensics and Security*, 2(3):450-461, 2007.
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- M.J. Bravo and H. Farid. Object Recognition in Clutter. *Perception & Psychophysics*, 68(6):911-918, 2006.
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- A.C. Popescu and H. Farid. Exposing Digital Forgeries in Color Filter Array Interpolated Images. *IEEE Transactions on Signal Processing*, 53(10):3948-3959, 2005.
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- H. Farid and A.C. Popescu. Blind Removal of Lens Distortions. *Journal of the Optical Society of America*, 18(9):2072-2078, 2001.
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X. Jiang, H. Farid, E. Pistor and R. S. Farid. A New Approach to the Design of Uniquely Folded Thermally Stable Proteins. *Protein Science*, 9:403-416, 2000.

E.H. Adelson and H. Farid. Filtering Reveals Form in Temporally Structured Displays. *Science*, 286:2231, 1999.

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H. Farid and E.P. Simoncelli. Range Estimation by Optical Differentiation. *Journal of the Optical Society of America*, 15(7): 1777-1786, 1998.

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P.S. Shenkin, H. Farid and J.S. Fetrow. Prediction and Evaluation of Side-chain Conformations for Protein Backbone Structures. *Proteins: Structure, Function and Genetics*, 26:323-352, 1996.

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H. Farid. How to Detect Faked Photos. *American Scientist*, March-April, 2017.

H. Farid. Seeing Is Not Believing. *IEEE Spectrum*, 46(8):44-48, 2009.

H. Farid. Digital Image Forensics. *Scientific American*, 298(6):66-71, 2008.

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H. Farid. Is Seeing Believing. *New Scientist*, 179(2411):38-41, 2003.

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(BOOK CHAPTERS)

H. Farid. Photo Fakery and Forensics. In *Advances in Computers*, Volume 77, Academic Press, 2009

H. Farid. Digital Doctoring: can we trust photographs? In *Deception: From Ancient Empires to Internet Dating*, Stanford University Press, 2009.

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W. Fan, S. Agarwal, and H. Farid. Rebroadcast Attacks: Defenses, Reattacks, and Redefenses. *European Signal Processing Conference*, Rome, Italy, 2018 (in press).

S. Agarwal, W. Fan, and H. Farid. A Diverse Large-Scale Dataset for Evaluating Rebroadcast Attacks. *IEEE International Conference on Acoustics, Speech and Signal Processing*, Calgary, Alberta, Canada, 2018.

S. Agarwal and H. Farid. Photo Forensics from JPEG Dimples. *IEEE Workshop on Image Forensics and Security*, Rennes, France, 2017.

S. Agarwal, D. Tran, L. Torresani, and H. Farid. Deciphering Severely Degraded License Plates. *SPIE Symposium on Electronic Imaging*, San Francisco, CA 2017.

T. Carvalho, H. Farid, and E. Kee. Exposing Photo Manipulation From User-Guided 3-D Lighting Analysis. *SPIE Symposium on Electronic Imaging*, San Francisco, CA, 2015.

V. Conotter, E. Bodnari, G. Boato, and H. Farid. Physiologically-based Detection of Computer Generated Faces in Video. *International Conference on Image Processing*, Paris, France, 2014.

M. Kirchner, P. Winkler and H. Farid. Impeding Forgers at Photo Inception. *SPIE Symposium on*

*Electronic Imaging*, San Francisco, CA, 2013.

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V. Conotter, G. Boato and H. Farid. Detecting Photo Manipulation on Signs and Billboards. *International Conference on Image Processing*, Hong Kong, 2010.

H. Malik and H. Farid. Audio Forensics from Acoustic Reverberation. *International Conference on Acoustics, Speech, and Signal Processing*, Dallas, TX, 2010.

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H. Farid and M.J. Bravo. Image Forensic Analyses that Elude the Human Visual System. *SPIE Symposium on Electronic Imaging*, San Jose, CA, 2010.

W. Wang and H. Farid. Exposing Digital Forgeries in Video by Detecting Double Quantization. *ACM Multimedia and Security Workshop*, Princeton, NJ, 2009.

E. Kee and H. Farid. Printer Profiling for Forensics and Ballistics. *ACM Multimedia and Security Workshop*, Oxford, UK, 2008.

W. Wang and H. Farid. Detecting Re-Projected Video. *10th International Workshop on Information Hiding*, Santa Barbara, CA, 2008.

M.K. Johnson and H. Farid. Detecting Photographic Composites of People. *6th International Workshop on Digital Watermarking*, Guangzhou, China, 2007.

W. Wang and H. Farid. Exposing Digital Forgeries in Video by Detecting Duplication. *ACM Multimedia and Security Workshop*, Dallas, TX, 2007.

M.K. Johnson and H. Farid. Exposing Digital Forgeries Through Specular Highlights on the Eye. *9th International Workshop on Information Hiding*, Saint Malo, France, 2007.

H. Farid. Exposing Digital Forgeries in Scientific Images. *ACM Multimedia and Security Workshop*, Geneva, Switzerland, 2006.

W. Wang and H. Farid. Exposing Digital Forgeries in Video by Detecting Double MPEG Compression. *ACM Multimedia and Security Workshop*, Geneva, Switzerland, 2006.

M.K. Johnson and H. Farid. Exposing Digital Forgeries Through Chromatic Aberration. *ACM Multimedia and Security Workshop*, Geneva, Switzerland, 2006.

M.K. Johnson and H. Farid. Exposing Digital Forgeries by Detecting Inconsistencies in Lighting. *ACM Multimedia and Security Workshop*, New York, NY, 2005.

S. Lyu, D. Rockmore, and H. Farid. Wavelet Analysis for Authentication. *Art + Math = X*, Boulder, CO, 2005.

J.E. Dobson, J.B. Woodward, S.A. Schwarz, J.C. Marchesini, H. Farid, and S.W. Smith. The Dartmouth Green Grid. *Workshop on High Performance Computing in Academia (in conjunction with International Conference on Computational Science)*, Atlanta, GA, 2005.

M.K. Johnson, S. Lyu and H. Farid. Steganalysis in Recorded Speech. *SPIE Symposium on Electronic Imaging*, San Jose, CA, 2005.

A.C. Popescu and H. Farid. Statistical Tools for Digital Forensics. *6th International Workshop on Information Hiding*, Toronto, CA, 2004.

- S. Lyu and H. Farid. Steganalysis Using Color Wavelet Statistics and One-Class Support Vector Machines. *SPIE Symposium on Electronic Imaging*, San Jose, CA, 2004.
- H. Sun, H. Farid, K. Rick, A. Hartov, D.W. Roberts, and K.D. Paulsen. Estimating Cortical Surface Motion Using Stereopsis for Brain Deformation Models. *Medical Image Computing & Computer Assisted Intervention (MICCAI)*, Montreal, Canada, 2003.
- J. Ford, H. Farid, F. Makedon, L.A. Flashman, T.W. McAllister, V. Megalooikonomou, and A.J. Saykin. Patient Classification of fMRI Activation Maps. *Medical Image Computing & Computer Assisted Intervention (MICCAI)*, Montreal, Canada, 2003.
- S. Periaswamy and H. Farid. Elastic Registration with Partial Data. *Second International Workshop on Biomedical Image Registration*, Philadelphia, PA, 2003.
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- S. Lyu and H. Farid. Detecting Hidden Messages Using Higher-Order Statistics and Support Vector Machines. *5th International Workshop on Information Hiding*, Noordwijkerhout, The Netherlands, 2002.
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ality and Telepresence for 21st Century Remote Medical Consultation. *Second Carolina Conference in Biomedical Engineering*, 1994.

PUBLICATIONS  
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ABSTRACT)

S. Nightingale, K. Wade, H. Farid, and D. Watson. Can Shadows and Reflections Help in the Detection of Photo Forgeries? *Society for Applied Research in Memory and Cognition*, Sydney, Australia, 2017.

D. Finnegan, G. Hamilton, L. Stearns, A. LeWinter, H. Farid, and H. Renedo. Tidewater Glacier Velocities from Repeat Ground-Based Terrestrial LiDAR Scanning; Helheim Glacier, Southeast Greenland. *Transactions of the American Geophysical Union*, San Francisco, CA, 2014.

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M.J. Bravo and H. Farid. Diagnostic Features are Prominent in Object Representations. *Vision Sciences*, Naples, FL, 2011.

D.T. Bolger, T. Morrison, B. Vance and H. Farid. Development and Application of a Computer-Assisted System for Photographic Mark-Recapture Analysis. *Ecological Society of America*, Pittsburgh, PA, 2010.

D.T. Bolger, T. Morrison, B. Vance and H. Farid. A New Software Application for Photographic Mark Recapture Analysis. *Society for Conservation Biology*, Edmonton Alberta, Canada, 2010.

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M.J. Bravo and H. Farid. Training Determines the Target Representation for Search. *Vision Sciences*, Naples, FL, 2009.

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- M.J. Bravo and H. Farid. Segmentation in Clutter. *Vision Sciences*, Sarasota, FL, 2002.
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H. Farid. Discrete-Time Fractional Differentiation from Integer Derivatives. TR2004-528, Department of Computer Science, Dartmouth College, December 2004.

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A.C. Popescu and H. Farid. Exposing Digital Forgeries by Detecting Duplicated Image Regions. TR2004-515, Department of Computer Science, Dartmouth College, September 2004.

S. Lyu, D. Rockmore, and H. Farid. Digital Art Forensics. TR2003-466, Department of Computer Science, Dartmouth College, June 2003.

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Would a Global Cyber Ethics Commission Help 'counter the lies' of Tech?, *Deutsche Welle*, 3.27.18

Pattern of 'denial and inaction' in Tech Firms' Response to Misuse, *The Straits Times*, 3.27.18

Is Hate in America Fueling Fake News, *CNN*, 3.21.18

Expert Warns of "Terrifying" Potential of Digitally-Altered Video, *CBS Morning Show*, 3.12.18

Combating Extremism Online, *The Open Mind, PBS*, 3.3.18

'Deep fakes': How to know what's true in the fake-Obama video era, *ABC News (Australia)*, 3.3.18

Are Computers Better than People at Predicting Crime?, *Science News*, 2.20.18

Do Predictive Algorithms Have A Place In Public Policy?, *Science Friday*, 1.19.18

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Theres an Algorithm to Fight Online Extremism, *Science Friday*, 1.27.17

Tech Companies Announce Plan to Identify Extremist Content, *NPR, All Things Considered*, 12.6.16

Blocking Terrorist Propaganda, *NHPR, Word of Mouth*, 8.30.16

How The War on Child Porn is Helping us Fight ISIS Propaganda, *Huffington Post*, 7.8.16

Software Looks to Stop The Spread of Extremist Videos, *VPR's Morning Edition*, 7.5.16

Using New Technologies To Fight ISIS Online, *NPR, Here & Now*, 6.23.16

Halting the Hate, *The Economist*, 6.23.16

New Technology Fights Online Extremism, *Morning Joe*, 6.23.16

A Tool to Delete Beheading Videos Before They Even Appear Online, *The Atlantic*, 6.22.16

New Tool to Take Down Terrorism Images Online Spurs Debate, *Washington Post*, 6.21.16

How Tech Can be Used to Track Terrorists, *Risk & Reward*, 12.12.15

Why Anti-Terror Technology Has Its Limits, *NPR, Weekend Edition*, 12.12.15

Was Controversial Lee Harvey Oswald Photo Faked?, *BBC Radio*, 10.21.15

Verdict is in on Whether Lee Harvey Oswald Photo is a Fake, *USA Today*, 10.20.15

Fake Photos on *All Sides with Ann Fisher*, 8.27.13

Software That Exposes Faked Photos, *New York Times*, 8.19.13

Crowdsourcing the Boston Marathon Investigation, *NPR, Here & Now*, 4.18.13

The Gaussian Blurred Line Of Photoshop In Advertising, *NPR, Colin McEnroe Show*, 1.16.13  
 Photo Retouching and Body Image, *CNN*, 8.12.12  
 From North Korea, an Altered Procession, *New York Times*, 12.28.11  
 Photo Retouching on *BBC World Service*, 12.20.11  
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 Exposing Digitally Doctored Photos in *Boston Globe*, 12.5.11  
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 They Aren't That Thin - Digital Retouching Gets Graded in *NPR, The Two-Way*, 11.30.11  
 Computer Model Spots Image Fraud in *Scientific American*, 11.29.11  
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 Hany Farid vs. Photoshop, *Business Week*, 12.20.10  
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 Can You Believe Your Eyes the Digital World?, *BBC News*, 8.2.10  
 The Technology Behind Spying, *NPR, All Things Considered*, 7.1.10  
 Child Porn Too Big For Law Enforcement?, *The Christian Science Monitor*, 6.13.10  
 How to Spot a Doctored Photo, *Wired*, 5.5.10  
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 Dartmouth Scientist Says Oswald Rifle Photo Real, *Vermont Public Radio*, 11.24.09  
 Is That Picture Real?, *NH Chronicle*, 11.23.09  
 Can You Believe Your Eyes?, *New York Times, Upfront*, 11.23.09  
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 Faked Photographs: Look, and Then Look Again *New York Times*, 8.23.09  
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 The Digital Detective, *San Jose Mercury News*, 12.14.08  
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 In A Photoshop Age, Can You Believe Your Eyes?, *NPR, Talk of the Nation*, 7.23.08  
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 Profile: Hany Farid, *NOVA, Science Now*, 6.25.08  
 Tampered Photos, *PRI, The World*, 6.3.08  
 Journals Find Fakery in Many Images, *Chronicle of Higher Education*, 5.29.08  
 Digital Detectives, *NHPR, Word of Mouth*, 5.15.08  
 Identifying Manipulated Images, *MIT Technology Review*, 3.16.08  
 Researchers Look to Spot Photo Hoaxes, *The Associated Press*, 2.25.08  
 Photo Tech Complicates Child-Porn Cases, *The Associated Press*, 2.25.08  
 An End to Picture Perfect Frauds, *Discovery Channel Magazine*, 2.1.08  
 How Can You Tell if a Picture is Real?, *The Today Show*, 12.21.07  
 Digital Forensics, *BBC, Night Waves*, 10.17.07  
 Proving That Seeing Shouldn't Always Be Believing, *New York Times*, 10.2.07  
 Digital Detectives Discern Photoshop Fakery, *The Christian Science Monitor*, 8.29.07  
 Distorted Picture, *American Journalism Review*, 7.30.07  
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 Great Shots That Never Happened, *Washington Post*, 4.15.07  
 Computing Photographic Forgeries, *Science News*, 3.17.07  
 Adobe Tackles Photo Forgeries, *Wired*, 3.8.07  
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 Science Fights the Fakes, *MSNBC*, 2.20.07  
 Surveillance: Video Evidence, *Newsweek International*, 1.15.07  
 Detecting Video Forgeries, *MIT Technology Review*, 11.29.06  
 Seeing is Believing?, *CBS News Sunday Morning*, 10.29.06  
 Digital Photo Manipulation, *BBC Digital Planet*, 9.4.06  
 Keeping It Real, *The Economist*, 8.17.06  
 Digital Art Authentication, *NPR, 1370 Connection*, 8.11.06

A Digital Life, *CNN*, 2.2.06  
 Should Journals Police Scientific Fraud?, *Nature News*, 2.2.06  
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 It May Look Authentic; Here's How to Tell It Isn't, *New York Times*, 1.24.06  
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 Can Photos be Trusted, *Popular Science*, 9.1.05  
 Spotting a Digital Hoax, *The Discovery Channel*, 3.16.05  
 In The Photoshop Era, It's Harder To Trust Your Eyes, *USA Today*, 2.2.05  
 Seeing is No Longer Believing, *The Christian Science Monitor*, 2.2.05  
 Professors Who Are Changing the World, *New Hampshire Magazine*, 2.1.05  
 Photoshop Sleuths, *MIT Technology Review*, 1.17.05  
 Art Forgeries (with John Myatt), *BBC World Service*, 12.15.04  
 Digital Forensics, *NHPR, Front Porch*, 12.14.04  
 Debunking Photoshop Fakery, *New York Times (Year in Ideas)*, 12.12.04  
 Is It Real or Is It Photoshopped, *Discover Magazine*, 9.27.04  
 Doctored Digital Images, *NPR, Future Tense*, 7.27.04  
 A New Flavor of Digital Truth Serum, *New York Times*, 7.22.04  
 Is Seeing Believing, *BBC News*, 9.8.03  
 History Undercover with Arthur Kent: Cyberterrorism, *The History Channel*, 7.26.03  
 Mapping with Math, *BBC News*, 12.3.02  
 Digital Tours of Murals, *The Chronicle of Higher Education*, 7.9.02  
 Hidden Messages, *WCAX TV News*, 10.19.01  
 Statistics Sniff Out Secrets appearing in *Technology Research News*, 9.26.01

#### INVITED TALKS

Data, AI, & You, *TEDx AmoskeagMillyard*, 6.18  
 Reining in Online Abuses, *Plymouth State University*, 3.18  
 Photo Forensics, *University of Pennsylvania*, 12.17  
 Reining in Online Abuses, *Building Alliances - Preventing Terror*, Brussels Belgium, 10.17  
 Reining in Online Abuses, *SUNY Albany, Massry Lecture*, 9.17  
 Photo Forensics, *University of California, Berkeley*, 9.17  
 Reining in Online Abuses, *University of California, Berkeley*, 9.17  
 Photographs, Hoaxes, and Conspiracies, *Gordon Conference: Visualization in Science*, 7.17  
 Photo Forensics from JPEG Coding Artifacts, *Media Forensics Workshop at CVPR (keynote)*, 7.17  
 Digital Video Forensics, *The Federal Judiciary Center*, 6.17  
 Reining in Online Abuses, *Williams College*, 5.17  
 Photo Forensics, *Williams College*, 5.17  
 Digital Image Forensics, *Office of Research Integrity*, 4.17  
 Digital Forensics: From Social Media to Social Impact, *National Academy of Inventors*, 4.17  
 Reining in Online Abuses, *Council of Engineering Systems Universities*, 3.17  
 Photo Forensics, *International Center of Photography*, 12.16  
 Photo Forensics, *Columbia University*, 12.16  
 Combating On-line Extremism, *United Nations*, 11.16  
 Photo Forensics from Lighting and Shadows, *Duke University*, 3.16  
 How Realistic is Photorealistic?, *Duke University*, 3.16  
 Photo Forensics, *Middlebury College*, 10.15  
 Photo Forensics and Verification, *TechRaking at MIT*, 9.15  
 Photo Forensics, *University of Wisconsin, Madison*, 4.15  
 Photo Forensics from Shadows & Shading, *SPIE Media Security, and Forensics (keynote)*, 1.14  
 Photo Forensics, *University of Oregon*, 1.14  
 Photo Forensics, *University of California, Riverside*, 1.14  
 Photo Forensics, *University of Delaware*, 9.13  
 Photo Forensics, *International Conference on Computational Photography (keynote)*, 4.13  
 Image Manipulation in News, *Computation + Journalism Symposium*, 2.13  
 Digital Forensics, *The World Bank*, 6.12  
 Photo Retouching, *Information Hiding (keynote)*, 5.12  
 Photo Forensics, *Stanford University*, 1.12  
 Ethics and Forensics in the Age of Photoshop Photojournalism, *MIT*, 4.11  
 Photo Forensics, *National Geographic*, 1.11  
 Photo Forensics: Lighting and Shadows, *Harvard University*, 9.10  
 Photo Forensics, *Applied Perception in Graphics & Visualization (keynote)*, 7.10  
 Limitations of Visually-Based Image Forensics, *Massachusetts Institute of Technology*, 4.10  
 Photo Forensics, *Massachusetts Institute of Technology*, 4.10

Digital Image Forensics, *Yale University*, 4.10  
 Digital Image Forensics, *IDGA Biometrics for National Security and Defense*, 3.10  
 Visually-Based Image Forensics, *IDGA Biometrics for National Security and Defense*, 3.10  
 Photo Forensics, *Smith-Kettlewell Eye Research Institute*, 2.10  
 Digital Image Forensics, *Adobe Inc.*, 1.10  
 Digital Image Forensics, *University of Rochester*, 11.09  
 On the Limitations of Visually-Based Image Forensics, *University of Rochester*, 11.09  
 Photo Forensics, *Brown University*, 10.09  
 Digital Forensics, *Biometrics: Theory, Applications and Systems (keynote)*, 9.09  
 Digital Tampering and Forensics, *University of California, San Diego*, 4.09  
 Image Forensics, *University of California, Berkeley*, 3.09  
 Estimating and Modeling Complex Lighting Environments, *University of Pennsylvania*, 10.08  
 Digital Tampering and Forensics, *National Institute of Standards*, 10.08  
 Digital Tampering and Forensics, *University of Massachusetts, Amherst*, 10.08  
 Digital Image Forensics, *American Society of Clinical Radiologists*, 9.08  
 Digital Tampering and Forensics, *SUNY Albany*, 9.08  
 Digital Tampering and Forensics, *Electronic Imaging Symposium (plenary talk)*, 1.08  
 Digital Image Forensics, *The National Academies*, 1.08  
 Digital Image Forensics, *IBM Almaden*, 11.07  
 Digital Image Forensics, *University of California, Berkeley*, 11.07  
 A Digital Technique for Art Authentication, *Harvard University Art Museum*, 10.07  
 Digital Image Forensics, *Google*, 4.07  
 Digital Image Forensics, *Foveon Inc.*, 4.07  
 Exposing Digital Forgeries from Inconsistencies in Lighting, *Carnegie Mellon University*, 3.07  
 Digital Forensics, *American Association for the Advancement of Science*, 2.07  
 Digital Image Forensics, *The Associated Press*, 2.07  
 Exposing Digital Forgeries from Inconsistencies in Lighting, *University of Pennsylvania*, 2.07  
 Digital Tampering in the Media, Politics and Law, *University of Pennsylvania*, 2.07  
 Digital Image Forensics, *Central Intelligence Agency*, 12.06  
 From Photons to Pixels to Photoshop, *Project Safe Childhood Conference*, 12.06  
 Digital Image Forensics, *Stanford University*, 10.06  
 From Photons to Pixels to Photoshop, *Crimes Against Children Conference*, 8.06  
 Digital Image Forensics, *Microsoft Corp.*, 6.06  
 A Digital Technique for Art Authentication, *Rochester Memorial Art Gallery*, 5.06  
 Digital Image Forensics, *Eastman Kodak*, 5.06  
 Digital Image Forensics, *Google*, 5.06  
 Digital Image Forensics, *University of California, Davis*, 5.06  
 Digital Image Forensics, *National Academy of Sciences*, 5.06  
 A Digital Technique for Art Authentication, *San Diego Museum of Art*, 3.06  
 A Picture is Worth a Thousand Lies, *Dartmouth College*, 2.06  
 Digital Image Forensics, *Ricoh Innovations*, 11.05  
 Energy vs. Synchrony in Perceptual Grouping, *University of California, San Diego*, 11.05  
 From Photons to Pixels to Photoshop, *Delaware Department of Justice*, 9.05  
 From Photons to Pixels to Photoshop, *High Tech. Crime Investigation Assoc.*, 8.05  
 Digital Image Forensics, *National Association of Attorneys General*, 6.05  
 How Realistic is Photorealistic?, *University of California, Santa Cruz*, 6.05  
 Digital Image Forensics, *University of California, Berkeley*, 5.05  
 Digital Image Forensics, *University of California, Santa Cruz*, 5.05  
 Digital Image Forensics, *National Association of Attorneys General*, 5.05  
 Digital Image Forensics, *Adobe Systems*, 4.05  
 Digital Image Forensics, *Office of Research Integrity*, 1.05  
 Digital Image Forensics, *University of New Hampshire*, 12.04  
 Digital Image Forensics, *New Hampshire Cyber Crime Network*, 12.04  
 Digital Image Forensics, *Leslie Center for the Humanities, Dartmouth College*, 11.04  
 Reconstructing Ancient Egyptian Tombs, *Society for Imaging Science and Tech.*, 10.04  
 Digital Image Forensics, *Adobe Systems*, 10.04  
 Digital Image Forensics, *National Association of Attorneys General*, 9.04  
 Digital Image Forensics, *University of Pennsylvania*, 7.04  
 How Realistic is Photorealistic?, *University of Illinois*, 4.04  
 Universal Steganalysis, *Central Intelligence Agency*, 2.04  
 How Realistic is Photorealistic?, *The Salk Institute*, 1.04  
 Grouping by Temporal Synchrony?, *The Salk Institute*, 1.04  
 How Realistic is Photorealistic?, *Stevens Institute of Technology*, 12.03

How Realistic is Photorealistic?, *Massachusetts Institute of Technology*, 11.03  
 How Realistic is Photorealistic?, *Harvard University*, 11.03  
 How Realistic is Photorealistic?, *University of Chicago*, 11.03  
 How Realistic is Photorealistic?, *University of Maryland*, 11.03  
 Grouping by Temporal Synchrony?, *University of Chicago*, 10.03  
 Mixing and Unmixing Digital Images, *Harvard University*, 10.02  
 Temporal Synchrony in Perceptual Grouping?, *University of Rochester*, 9.02  
 Mixing and Unmixing Digital Images, *New York University*, 4.02  
 Mixing and Unmixing Digital Images, *University of Pennsylvania*, 3.02  
 Digital Tampering, *Washington University, St. Louis*, 1.02  
 Digital Secrets, *Boston University*, 12.01  
 Grouping by Temporal Synchrony, *Harvard University*, 11.01  
 Blind Removal of Image Non-Linearities, *Columbia University*, 11.01  
 Blind Removal of Image Non-Linearities, *Massachusetts Institute of Technology*, 10.01  
 Grouping by Temporal Synchrony, *New York University*, 10.01  
 Grouping by Temporal Synchrony, *Massachusetts Institute of Technology*, 3.01  
 Grouping by Temporal Synchrony, *University of Pennsylvania*, 3.01  
 Grouping by Temporal Synchrony, *Boston University*, 2.01  
 Blind Removal of Image Non-Linearities, *University of Pennsylvania*, 3.00  
 Digital Image Separation, *George Mason University*, 3.00  
 Grouping in Temporally Synchronous Displays, *Dartmouth College*, 12.99  
 Separating Digital Images, *Brooklyn Polytechnic University*, 3.99  
 Separating Digital Images, *Dartmouth College*, 3.99  
 ICA for Separating Images, *Massachusetts Institute of Technology*, 2.99  
 Separating Images, *University of Pennsylvania*, 10.98  
 Monocular Stereo, *Polaroid Inc*, 7.98  
 Digital Image Enhancement, *Williams College*, 4.98  
 Monocular Stereo, *Massachusetts Institute of Technology*, 3.98  
 Range Estimation by Optical Differentiation, *University of California, Berkeley*, 3.97  
 A Differential Optical Range Camera, *Sensar Inc.*, 11.96  
 Direct Differential Range Estimation, *Columbia University*, 5.96  
 Steerable Filters for Low-level Image Processing, *SUNY Albany*, 11.95  
 3-D Scene Reconstruction for Telepresence, *UNC, Chapel Hill*, 6.94

PROFESSIONAL  
ACTIVITIES

IEEE Fellow, 2018  
Phi Beta Kappa (honorary), 2017

ASSOCIATE  
EDITOR

IEEE Transactions on Information Forensics and Security, 2005-2008

PROGRAM  
COMMITTEE

Workshop on Image Forensics, CVPR, 2017  
 IEEE Workshop on Image Forensics (WIFS), 2017  
 International Conference on Computational Photography, 2012-2015  
 Information Hiding, 2010  
 Media Security and Forensics (Electronic Imaging), 2009-2011  
 Technical Advisory Board for Berkman's Internet Safety Task Force, 2008  
 Vision of the Unseen (CVPR Workshop), 2008  
 Statistical Learning in Computer Vision (ECCV Workshop), 2004  
 American Association for Artificial Intelligence (Vision/Perception), 2004  
 Statistical Analysis in Computer Vision (CVPR Workshop), 2003

REVIEWER

NSF review panel (SBIR/STTR Phase I), 2018  
 NSF review panel (RI Small), 2013  
 NSF review panel (ITR Medium), 2003  
 NSF review panel (CAREER: RHA/CV), 2000, 2002, 2003  
 NSF review panel (RHA/CV), 2000  
 American Association for Artificial Intelligence (AAAI), Computer Analysis of Images and Patterns (CAIP), Computer Vision and Pattern Recognition (CVPR), Electronics Letters, European Conference on Computer Vision (ECCV), IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Signal Processing, IEEE Transactions on Information Security and Forensics, Information Hiding, International Conference on Computer Vision (ICCV), International Journal of

Computer Vision, International Journal of Imaging Systems and Technology, Journal of Cognitive Neuroscience, Journal of the Optical Society of America, Journal of Visual Communication and Image Representation, Medical Physics, Perception, Proceedings of the Royal Society: Biological Sciences, SIGGRAPH, Vision and Applications, Vision Research

## STUDENTS

Shruti Agarwal, Ph.D. adviser  
Tiago Carvalho (2014), visiting Ph.D. student (UNICAMP, Brazil)  
Emma Chiu '19, research adviser  
Valentina Conotter (2011), Ph.D. co-adviser (University of Trento)  
Julia Dressel '17, senior thesis adviser  
Wei Fan, postdoctoral fellow  
Olivia Holmes '15, senior thesis adviser  
Daniel Hopkins '10, research adviser  
Kimo Johnson (2007), Ph.D. adviser  
Eric Kee (2013), Ph.D. adviser  
Jethro Rothe-Kushel '03, research adviser  
Benedikt Lorch (2018), visiting M.S. student (University of Erlangen)  
Siwei Lyu (2005), Ph.D. adviser  
Brandon Mader '16, research adviser  
David Martin '00, senior thesis adviser  
Kiley McEvoy '06, research adviser  
Joseph Pechter '04, senior thesis adviser  
William Pechter '04, senior thesis adviser  
Senthil Periaswamy (2003), Ph.D. adviser  
Coralie Phanord '16, research adviser  
Andrew Pierce '02, research adviser  
Alin Popescu (2005), Ph.D. adviser  
Nelson Rosa '06, research adviser  
Katherine Sherwin '01, research adviser  
Priyanka Singh, postdoctoral fellow  
Hai Sun (2004), Ph.D. co-adviser  
Sydni Topper '18, research adviser  
Joshua Wang '15, thesis adviser  
Weihong Wang (2009), Ph.D. adviser  
Angela Zhu '17, research adviser

## TEACHING

Foundations of Applied Computer Science, Spring 2018  
Data Structures and Analytics, Tuck School of Business, Spring 2017  
Fundamentals of Web Programming, Tuck School of Business, Spring 2017  
Introduction to Programming and Computation, CS 1, Fall 2016  
Fundamentals of Web Programming, Tuck School of Business, Spring 2016  
Numerical and Computational Tools for Applied Science, CS 70/170, Spring 2016  
Introduction to Programming and Computation, CS 1, Fall 2015  
Numerical and Computational Tools for Applied Science, CS 70/170, Spring 2015  
Introduction to Programming and Computation, CS 1, Fall 2014  
Introduction to Programming and Computation, CS 1, Spring 2014  
Introduction to Programming and Computation, CS 1, Spring 2013  
Digital Image Forensics, CS 89/189, Spring 2013  
Digital Forensics, University of Trento, Italy, Spring 2011  
Numerical and Computational Tools for Applied Science, CS 36/136, Summer 2008  
Concepts in Computing, CS 4, Summer 2008  
Numerical and Computational Tools for Applied Science, CS 36/136, Summer 2007  
Concepts in Computing, CS 4, Summer 2007  
Concepts in Computing, CS 4, Winter 2006  
Numerical Methods in Computer Vision, CS 88/188, Fall 2004  
Concepts in Computing, CS 4, Summer 2003  
Concepts in Computing, CS 4, Summer 2002  
Data Structures and Programming, CS 15, Winter 2002  
Data Structures and Programming, CS 15, Fall 2001  
Numerical Linear Algebra, CS106, Spring 2001  
Data Structures and Programming, CS 15, Winter 2001  
Data Structures and Programming, CS 15, Fall 2000



Fundamentals of Image Processing, CS 88/188, Spring 2000  
Programming Languages, CS 68, Winter 2000  
Data Structures and Programming, CS 15, Fall 1999

COLLEGE Department Chair, 2015-2018  
COMMITTEES Committee Advisory to the President (tenure & promotions), 2016-2018  
Department Associate Chair, 2004-2009  
Ph.D. Advisor, 2004-2006  
Steering Committee, Neuroscience Major, 2004-2008  
Director Search, Neukom Institute for Computational Science, 2005  
HHMI Undergraduate Biological Sciences Education Proposal, 2005  
Green Grid Computing, 2004-2005  
Computer Science Building Expansion, 2003-2005  
Faculty Search, Thayer School of Engineering, 2004  
Department Web Master, 1999-2004  
Faculty Recruiting, 2003, 2010-2011  
Ph.D. Admissions 2001-2003, 2010, 2012  
Associate Director Search, ISTS, 2002  
M.D./Ph.D. Admissions, 2001

TESTIMONY European Parliament Special Committee on Terrorism, 4.24.18  
Singapore Select Committee on Deliberate Online Falsehoods, 3.27.18  
United States Senate Judiciary, 9.3.17 (topic: on-line extremism)  
United Nations Counter-Terrorism Committee Executive Directorate, 11.30.16

EXPERT WITNESS Salenger v. Inergy, 2017  
TESTIMONY United States of America v. Sweeney, 2016  
Adobe v. Everyscape, Boston, Massachusetts, 2015  
Hargett v. Frost, Indianapolis, Indiana, 2014 (deposition)  
Ceglia v. Zuckerberg, 2012, (deposition)  
United States of America v. Paul Burdulis, Worcester, Massachusetts, 2012  
Garza, et al. v. Allied Chemical Corporation, et al., Hidalgo County, Texas, 2009  
Operation Algebra, Edinburgh, Scotland, 2009  
Pack v. Ross, et al, Nashville, Tennessee, 2009  
State of New Hampshire. v. Katherine Johnson, 2009  
DesertMicro v. Piersall, Jacksonville, Florida, 2007  
State of Florida v. Michael Quattrocchi, 2007  
State of Maine v. Melvin Logan, 2007  
United States of America v. San Diego Gas & Electric Company, et al., 2007  
State of Ohio v. David Harrison, 2006  
State of New Hampshire v. John Lacroix, 2005  
Graphic Security Systems v. Nautilus Security, 2005  
State of Ohio v. Mark A. Heilman, 2004