JAMES M. COUGHLAN

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EDUCATION

Harvard University. Ph.D. in Physics, 1998 (A.M. conferred in 1993). Thesis under A. L. Yuille on efficient computer vision algorithms for finding deformable shapes.

Harvard College. A.B. in Physics magna cum laude, 1990.

HONORS

National Advisory Eye Council member, National Eye Institute of the National Institutes of Health, Jun 2020 – Nov 2023.

2020 Dr. Arthur I. Karshmer Award for Assistive Technology Research, "Towards Accessible Audio Labeling of 3D Objects." Awarded for best submission to the Science/Research Journal Track of the CSUN 2020 Assistive Technology Conference.

Outstanding Reviewer Award for Computer Vision and Pattern Recognition 2010.

Best Paper Award for "Detecting and Locating Crosswalks using a Camera Phone" in Fourth IEEE Workshop on Embedded Computer Vision, in conjunction with Computer Vision and Pattern Recognition 2008.

Honorable Mention Winner of the 27th Annual Pattern Recognition Society Award for "An A* Perspective on Deterministic Optimization for Deformable Templates." Selected by Editorial Board of *Pattern Recognition*, 2001.

Ruth L. Kirschstein NRSA Fellow, 1998-1999.

White Award for Excellence in Teaching. Harvard Physics Department, 1993.

Phi Beta Kappa. Harvard College, 1989.

PROFESSIONAL EXPERIENCE

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA
Director, Rehabilitation Engineering Research Center on Blindness and Low Vision.
2022-present.

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA
Associate Director, Rehabilitation Engineering Research Center on Blindness and Low Vision.
2016-2022.

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA

Senior Scientist, Rehabilitation Engineering Research Center.
2012-present.

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA
Scientist, Rehabilitation Engineering Research Center.
2008-2011.

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA
Associate Scientist, Rehabilitation Engineering Research Center.
2003-2007.

SMITH-KETTLEWELL INSTITUTE — San Francisco, CA
Post-doctoral Fellow for Dr. Alan Yuille. 1998-2002.

HARVARD UNIVERSITY — Cambridge, MA
Teaching Fellow in Department of Physics. 1991-1994.

CAMBRIDGE RESEARCH LAB/DEC — Cambridge, MA
Research Assistant for Dr. Richard Szeliski. Summer 1993.

HARVARD UNIVERSITY — Cambridge, MA
Research Assistant for Prof.'s Michael Tinkham and Chris Lobb.
Summer 1989.

CERN — Geneva, Switzerland
Research Assistant for Prof. Karl Strauch. Summer 1988.

RESEARCH INTERESTS

Applications of computer vision for blind and visually impaired persons, including guidance at traffic intersections, hazard detection for blind wheelchair users and wayfinding using machine-readable signage. Bayesian probability methods in computer and human vision, particularly the use of graphical models and belief propagation for visual search and segmentation. Psychophysical modeling of visual search, eye movements and integration of foveal and peripheral information.

TEACHING EXPERIENCE

Teaching Fellow, Physics Department, Harvard University. Fall 1991-summer 1994, summer 1996. Served as section leader and lab instructor for the following courses: Physics 15b, Introductory Electromagnetism; Physics 5, Honors Introductory Mechanics and Electromagnetism; Physics 191r, Advanced Laboratory; and Physics S-1ab, Principles of Physics.

JOURNAL PUBLICATIONS

B. Biggs, H. Agbaroji, C. Toth, T. Stockman, J. Coughlan & B. Walker. “Co-Designing Auditory Navigation Solutions for Traveling as a Blind Individual During The COVID-19 Pandemic.” Journal of Blindness Innovation and Research. In press.

J. Hong & J. Coughlan. “VR Training to Facilitate Blind Photography for Navigation.” Journal on Technology and Persons with Disabilities. Vol 11. 2023. NIHMSID: 1933572.

C. Pitcher-Cooper, M. Seth, B. Kao, J. Coughlan & I. Yoon. (2023). You Described, We Archived: A Rich Audio Description Dataset. Journal on Technology and Persons with Disabilities. Vol 11. 2023. NIHMSID: 1933567.

R. Crabb, S. A. Cheraghi & J. Coughlan. "A Lightweight Approach to Localization for Blind and Visually Impaired Travelers." Sensors 23, no. 5: 2701. 2023. https://doi.org/10.3390/s23052701 PMCID: PMC10007266.

B. Biggs, C. Pitcher-Cooper & J. Coughlan. "Getting in Touch with Tactile Map Automated Production: Evaluating Impact and Areas for Improvement." Journal on Technology and Persons with Disabilities. 2022. PMCID: PMC10065749.

S. A. Cheraghi, G. Fusco & J. Coughlan. "Real-Time Sign Detection for Accessible Indoor Navigation." Journal on Technology and Persons with Disabilities. Vol. 9. 2021. PMCID: PMC8331194.

J. Coughlan, H. Shen & B. Biggs. "Towards Accessible Audio Labeling of 3D Objects." Journal on Technology and Persons with Disabilities. Vol. 8. 2020. PMCID: PMC7425180. *Winner of the 2020 Dr. Arthur I. Karshmer Award for Assistive Technology Research.*

D. Ahmetovic, R. Manduchi, J. Coughlan & S. Mascetti. (2017). "Mind your crossings: Mining GIS imagery for crosswalk localization." ACM Transactions on Accessible Computing. 2017. PMCID: PMC5531764.

E. Tekin, D. Vásquez and J. Coughlan. "S-K Smartphone Barcode Reader for the Blind." Journal on Technology and Persons with Disabilities. Vol, 1, 2013. PMCID: PMC4288446.

J. Coughlan and H. Shen. "Crosswatch: a System for Providing Guidance to Visually Impaired Travelers at Traffic Intersections." Journal of Assistive Technologies (JAT). Vol. 7, Issue 2, pp. 131-142. 2013. PMCID: PMC3864896.

R. Manduchi and J. Coughlan. "(Computer) Vision without Sight." Invited paper in Communications of the ACM, (55) 1, pp. 96-104. Jan. 2012. PMCID: PMC3398697.

J. Coughlan and R. Manduchi. "Functional Assessment of a Camera Phone-Based Wayfinding System Operated by Blind and Visually Impaired Users." International Journal on Artificial Intelligence Tools. Vol. 18, No. 3, pp. 379–397. 2009. PMCID: PMC2786081.

H. Shen, J. Coughlan and V. Ivanchenko. "Figure-Ground Segmentation Using Factor Graphs." Special Issue of Image and Vision Computing. 2009. PMCID: PMC2755638.

H. Shen, K.Y. Chan, J. Coughlan and J. Brabyn. "A Mobile Phone System to Find Crosswalks for Visually Impaired Pedestrians." Technology and Disability, Vol. 20, Number 3, pp. 217-224. 2008. PMCID: PMC2856957.

J. Coughlan and R. Manduchi. "Color Targets: Fiducials to Help Visually Impaired People Find Their Way by Camera Phone." EURASIP Journal on Image and Video Processing, special issue on Image and Video Processing for Disability. Vol. 2007, Article ID 96357, 13 pages, 2007. doi:10.1155/2007/96357.

J. Coughlan and H. Shen. "Dynamic Quantization for Belief Propagation in Sparse Spaces." Computer Vision and Image Understanding (CVIU) Special issue on Generative-Model Based Vision. Volume 106, Issue 1, pp. 47-58. April 2007.

L. Renninger, P. Verghese and J. Coughlan. "Where to look next? Eye movements reduce local uncertainty." Journal of Vision. Volume 7, Number 3, Article 6, pp. 1-17. 2007.

A.L. Yuille, J. Coughlan and S. Konishi. "The Generic Viewpoint Assumption and Planar Bias." IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI). Vol. 25, No. 6, pp. 775-778. June 2003.

J. Coughlan and A.L. Yuille. "Manhattan World: Orientation and Outlier Detection by Bayesian Inference." Neural Computation. Vol. 15, No. 5, pp. 1063-88. May 2003.

A.L. Yuille, J. Coughlan and S. Konishi. "The KGBR Viewpoint-Lighting Ambiguity." Journal of the Optical Society of America A. Vol. 20, Issue 1, pp. 24-31. January 2003.

J. Coughlan and A.L. Yuille. "Algorithms from Statistical Physics for Generative Models of Images." Image and Vision Computing (IVC) Special issue on Generative-Model Based Vision. Vol. 21/1, pp.29 - 36. 2003.

S. Konishi, A.L. Yuille and J. Coughlan. "A Statistical Approach to Multi-Scale Edge Detection." Image and Vision Computing (IVC) Special issue on Generative-Model Based Vision. Vol. 21/1, pp.37 - 48. 2003.

S. Konishi, A.L. Yuille, J. Coughlan and S.C. Zhu. "Statistical Edge Detection: Learning and Evaluating Edge Cues." IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Vol. 25, No. 1, pp. 57-74. January 2003.

J. Coughlan and A.L. Yuille. "Bayesian A* Tree Search with Expected O(N) Node Expansions for Road Tracking." Neural Computation. Vol. 14, No. 8, pp. 1929-58. August 2002.

A.L. Yuille, J. Coughlan, Y. Wu and S.C. Zhu. "Order Parameters for Detecting Target Curves in Images: When does High-Level Knowledge Help?" International Journal of Computer Vision, 41(1/2):9-33. 2001.

J. Coughlan, A.L. Yuille, C. English and D. Snow. "Efficient Deformable Template Detection and Localization without User Initialization." Computer Vision and Image Understanding, Vol. 78, No. 3, pp. 303-319. June 2000.

A.L. Yuille and J. Coughlan. "An A* Perspective on Deterministic Optimization for Deformable Templates." Pattern Recognition: Special Edition on Optimization. M. Pelillo and E.R. Hancock, editors. Volume 33, Issue 4, pp. 603-616. April 2000. *Honorable Mention Winner of the 27th Annual Pattern Recognition Society Award, 2001.*

A.L. Yuille and J. Coughlan. "Fundamental Limits of Bayesian Inference: Order Parameters and Phase Transitions for Road Tracking." IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Vol. 22, No. 2, pp. 160-173. February 2000.

R. Szeliski and J. Coughlan. "Hierarchical Spline-Based Image Registration." International Journal of Computer Vision, 22(3):199-218. March/April 1997.

REFEREED CONFERENCE PUBLICATIONS

J. Coughlan, B. Biggs and H. Shen. "Non-Visual Access to an Interactive 3D Map." Joint International Conference on Digital Inclusion, Assistive Technology & Accessibility (ICCHP-AAATE '22). Lecco, Italy. July 2022. PMCID: PMC9467469.

B. Biggs, C. Toth, T. Stockman, J. Coughlan and B. Walker. "Evaluation of a Non-Visual Auditory Choropleth and Travel Map Viewer." International Conference on Auditory Display (ICAD) 2022. Virtual conference. June 2022. PMCID: PMC10010675.

B. Biggs, J. Coughlan and P. Coppin. “Design and evaluation of an interactive 3D map.” Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) 2021 Virtual Conference. July 2021. PMCID: PMC8341294. Link: https://www.resna.org/sites/default/files/conference/2021/AgingCognitiveSensory/91_Biggs.html

G. Fusco, S. A. Cheraghi, L. Neat and J. Coughlan. “An Indoor Navigation App using Computer Vision and Sign Recognition.” 17th International Conference on Computers Helping People with Special Needs (ICCHP '20). Lecco, Italy. Sept 2020. PMCID: PMC33263114.

J. Coughlan, B. Biggs, M.-A. Rivière and H. Shen. “An Audio-Based 3D Spatial Guidance AR System for Blind Users.” 17th International Conference on Computers Helping People with Special Needs (ICCHP '20). Lecco, Italy. Sept 2020. PMCID: PMC7676634.

G. Fusco and J. Coughlan. “Indoor Localization for Visually Impaired Travelers Using Computer Vision on a Smartphone.” 17th International Web for All Conference (W4A'20). Taipei, Taiwan. April 2020. PMCID: PMC7643919.

B. Biggs, J. Coughlan and P. Coppin. “Design and Evaluation of an Audio Game-Inspired Auditory Map Interface.” 25th International Conference on Auditory Display (ICAD 2019). Northumbria University, Newcastle-upon-Tyne, UK. June 2019. PMCID: PMC7015068.

G. Fusco and J. Coughlan. “Indoor Localization using Computer Vision and Visual-Inertial Odometry.” 16th International Conference on Computers Helping People with Special Needs (ICCHP '18). Linz, Austria. July 2018. PMCID: PMC6497170.

J. Coughlan and J. Miele. “AR4VI: AR as an Accessibility Tool for People with Visual Impairments.” AR for Good Workshop, in conjunction with IEEE Int’l Symposium on Mixed and Augmented Reality. Nantes, France. Oct 2017. PMCID: PMC5749423.

J. Coughlan and J. Miele. “Evaluating Author and User Experience for an Audio-Haptic System for Annotation of Physical Models.” 19th Int’l ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2017). Baltimore, MD. Oct. 2017. PMCID: PMC5714613.

S. Mascetti, A. Gerino, C. Bernareggi, S. D’Acquisto, M. Ducci and J. Coughlan. “JustPoint: Identifying Colors with a Natural User Interface.” 19th Int’l ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2017). Baltimore, MD. Oct. 2017. PMCID: PMC5714614.

A. Rituerto, G. Fusco, & J. Coughlan. (2016). “Towards a Sign-Based Indoor Navigation System for People with Visual Impairments.” In 18th International ACM SIGACCESS Conference on Computers and Accessibility. Reno, NV: ACM. PMCID: PMC5714555.

G. Fusco, E.Tekin, N.A. Giudice and J. Coughlan. “Appliance Displays: Accessibility Challenges and Proposed Solutions.” 17th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2015). Lisbon, Portugal. Oct. 2015. PMCID: PMC4725718.

D. Ahmetovic D, R. Manduchi, J. Coughlan J and S. Mascetti. “Zebra Crossing Spotter: Automatic Population of Spatial Databases for Increased Safety of Blind Travelers.” 17th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2015). Lisbon, Portugal. Oct. 2015. PMCID: PMC4725710.

G. Fusco, E.Tekin, R. Ladner and J. Coughlan. “Using Computer Vision to Access Appliance Displays.” 16th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2014). Rochester, New York. Oct. 2014. PMCID: PMC4269285.

G. Fusco, H. Shen, V. Murali and J. Coughlan. “Determining a Blind Pedestrian’s Location and Orientation at Traffic Intersections.” 14th International Conference on Computers Helping People with Special Needs (ICCHP '14). Saint-Denis, France. July 2014. PMCID: PMC4293520.

E. Tekin, J. Coughlan and H. Simon. “An Investigation Into Incorporating Visual Information in Audio Processing.” 14th International Conference on Computers Helping People with Special Needs (ICCHP '14). Saint-Denis, France. July 2014. PMCID: PMC4447090.

G. Fusco, H. Shen, V. Murali and J. Coughlan. “Self-Localization at Street Intersections.” 11th Conference on Computer and Robot Vision (CRV 2014). Montréal, Canada. May 2014. PMCID: PMC4157747.

R. Manduchi and J. Coughlan. “The Last Meter: Blind Visual Guidance to a Target.” ACM CHI Conference on Human Factors in Computing Systems (CHI 2014). Toronto, Canada. Apr. 2014. PMCID: PMC 4241272.

H. Shen, O. Edwards, J. Miele and J. Coughlan. “CamIO: a 3D Computer Vision System Enabling Audio/Haptic Interaction with Physical Objects by Blind Users.” 15th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2013). Bellevue, Seattle. Oct. 2013.

V. Murali and J. Coughlan. “Smartphone-Based Crosswalk Detection and Localization for Visually Impaired Pedestrians.” ICME 2013 Workshop on Multimodal and Alternative Perception for Visually Impaired People (MAP4VIP), a satellite workshop of IEEE International Conference on Multimedia and Expo (ICME 2013). San Jose, CA. July 2013. PMCID: PMC4210954.

J. Coughlan and H. Shen. “The Crosswatch Traffic Intersection Analyzer: A Roadmap for the Future.” 13th International Conference on Computers Helping People with Special Needs (ICCHP '12). Linz, Austria. July 2012.

H. Shen and J. Coughlan. “Towards a Real-Time System for Finding and Reading Signs for Visually Impaired Users.” 13th International Conference on Computers Helping People with Special Needs (ICCHP '12). Linz, Austria. July 2012.

E. Tekin, J. Coughlan and H. Shen. "Real-Time Detection and Reading of LED/LCD Displays for Visually Impaired Persons." 2011 IEEE Workshop on Applications of Computer Vision (WACV 2011). Kona, Hawaii. Jan. 2011. PMCID: PMC3146550.

P. Sanketi, H. Shen and J. Coughlan. "Localizing Blurry and Low-Resolution Text in Natural Images." 2011 IEEE Workshop on Applications of Computer Vision (WACV 2011). Kona, Hawaii. Jan. 2011. PMCID: PMC3132180.

P. Sanketi and J. Coughlan. “Anti-Blur Feedback for Visually Impaired Users of Smartphone Cameras.” 12th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS ’10). Orlando, Florida. Oct. 2010. PMCID: PMC4778956.

E. Tekin and J. Coughlan. “A Mobile Phone Application Enabling Visually Impaired Users to Find and Read Product Barcodes.” 12th International Conference on Computers Helping People with Special Needs (ICCHP '10). Vienna, Austria. July 2010. PMCID: PMC4777613.

V. Ivanchenko, J. Coughlan and H. Shen. “Real-Time Walk Light Detection with a Mobile Phone.” 12th International Conference on Computers Helping People with Special Needs (ICCHP '10). Vienna, Austria. July 2010. PMCID: PMC4778721.

V. Ivanchenko, H. Shen and J. Coughlan. “Elevation-Based Stereo Implemented in Real-Time on a GPU.” 2009 IEEE Workshop on Applications of Computer Vision (WACV 2009). Snowbird,

Utah. Dec. 2009.

E. Tekin and J. Coughlan. “An Algorithm Enabling Blind Users to Find and Read Barcodes.” 2009 IEEE Workshop on Applications of Computer Vision (WACV 2009). Snowbird, Utah. Dec. 2009. PMCID: PMC2898214.

J. Coughlan and R. Manduchi. “A Mobile Phone Wayfinding System for Visually Impaired Users.” Association for the Advancement of Assistive Technology in Europe (AAATE 2009). Florence, Italy. Sept. 2009. PMCID: PMC2964888.

V. Ivanchenko, J. Coughlan and H. Shen. “Staying in the Crosswalk: A System for Guiding Visually Impaired Pedestrians at Traffic Intersections.” Association for the Advancement of Assistive Technology in Europe (AAATE 2009). Florence, Italy. Sept. 2009. PMCID: PMC2964893.

E. Tekin and J. Coughlan. “A Bayesian Algorithm for Reading 1D Barcodes.” Sixth Canadian Conference on Computer and Robot Vision (CRV 2009). Kelowna, British Columbia. May 2009. PMCID: PMC2859730.

V. Ivanchenko, J. Coughlan, W. Gerrey and H. Shen. “Computer Vision-Based Clear Path Guidance for Blind Wheelchair Users.” 10th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2008). Halifax, Canada. Oct. 2008.

V. Ivanchenko, J. Coughlan and H. Shen. “Crosswatch: a Camera Phone System for Orienting Visually Impaired Pedestrians at Traffic Intersections.” 11th International Conference on Computers Helping People with Special Needs (ICCHP '08). Linz, Austria. July 2008. PMCID: PMC4777606.

R. Manduchi and J. Coughlan. “Portable and Mobile Systems in Assistive Technology: Introduction to the Special Thematic Session.” 11th International Conference on Computers Helping People with Special Needs (ICCHP '08). Linz, Austria. July 2008.

R. Manduchi, J. Coughlan and V. Ivanchenko. “Search Strategies of Visually Impaired Persons using a Camera Phone Wayfinding System.” 11th International Conference on Computers Helping People with Special Needs (ICCHP '08). Linz, Austria. July 2008. PMCID: PMC4777605.

V. Ivanchenko, J. Coughlan and H. Shen. “Detecting and Locating Crosswalks using a Camera Phone.” Fourth IEEE Workshop on Embedded Computer Vision, in conjunction with Computer Vision and Pattern Recognition (CVPR ‘08). Anchorage, Alaska. June 2008. PMCID: PMC2874980. *Received Best Paper Award in Workshop on Embedded Computer Vision.*

K.-Y. Chan, R. Manduchi and J. Coughlan. “Accessible Spaces: Navigating through a Marked Environment with a Camera Phone.” Ninth International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2007). Tempe, AZ. Oct. 2007.

J. Coughlan and H. Shen. “Terrain Analysis for Blind Wheelchair Users: Computer Vision Algorithms for Finding Curbs and Other Negative Obstacles.” Conference and Workshop on Assistive Technology for People with Vision and Hearing Impairments (CVHI '07). Granada, Spain. August 2007.

H. Shen and J. Coughlan. “Grouping Using Factor Graphs: an Approach for Finding Text with a Camera Phone.” Workshop on Graph-based Representations in Pattern Recognition (GbR ’07, in conjunction with The International Association for Pattern Recognition). June 2007. Alicante, Spain.

J. Coughlan and R. Manduchi. “Functional Assessment of a Camera Phone-Based Wayfinding System Operated by Blind Users.” IEEE-BAIS (IEEE Computer Society and the Biological and Artificial Intelligence Society) RAT-07 (Research on Assistive Technologies) Symposium. Dayton, Ohio. April 2007.

H. Shen and J. Coughlan. “Finding Text in Natural Scenes by Figure-Ground Segmentation.” International Conference on Pattern Recognition (ICPR ‘06). Hong Kong. August 2006.

J. Coughlan, R. Manduchi and H. Shen. "Computer Vision-Based Terrain Sensors for Blind Wheelchair Users." 10th International Conference on Computers Helping People with Special Needs (ICCHP ’06). Linz, Austria. July 2006.

H. Shen and J. Coughlan. “Reading LCD/LED Displays with a Camera Cell Phone.” 2nd IEEE Workshop on Embedded Computer Vision (ECVW ’06), in conjunction with CVPR 2006. New York. June 2006.

J. Coughlan, R. Manduchi and H. Shen. “Cell Phone-based Wayfinding for the Visually Impaired.” 1st International Workshop on Mobile Vision, in conjunction with ECCV 2006. Graz, Austria. May 2006.

J. Coughlan and H. Shen. “A Fast Algorithm for Finding Crosswalks using Figure-Ground Segmentation.” 2nd Workshop on Applications of Computer Vision, in conjunction with ECCV 2006. Graz, Austria. May 2006.

J. Coughlan, R. Manduchi, M. Mutsuzaki and H. Shen. “Rapid and Robust Algorithms for Detecting Colour Targets.” 10th Congress of the International Colour Association, AIC Colour ’05, pp. 959 - 962. Granada, Spain. May 2005.

L. W. Renninger, J. Coughlan, P. Verghese and J. Malik. “An Information Maximization Model of Eye Movements.” Neural Information Processing Systems (NIPS ‘04). Vancouver, Canada. December 2004.

J. Coughlan and H. Shen. “Shape Matching with Belief Propagation: Using Dynamic Quantization to Accommodate Occlusion and Clutter.” Generative-Model Based Vision (GMBV 2004, in conjunction with CVPR 2004). Washington, DC. June 2004.

A. Rangarajan, J. Coughlan and A. L. Yuille. “A Bayesian Network Framework for Relational Shape Matching.” The Ninth International Conference on Computer Vision (ICCV ’03). pp. 671-678. Nice, France. October 2003.

J. Coughlan and S. Ferreira. “Finding Deformable Shapes using Loopy Belief Propagation.” The Seventh European Conference on Computer Vision (ECCV ’02). pp. 453-468. Copenhagen, Denmark. May 2002.

J. Coughlan and A.L. Yuille. “Algorithms from Statistical Physics for Generative Models of Images.” First International Workshop on Generative-Model-Based Vision (in conjunction with ECCV ’02). Copenhagen, Denmark. May 2002.

S. Konishi, A.L. Yuille and J. Coughlan. “A Statistical Approach to Multi-Scale Edge Detection.” First International Workshop on Generative-Model-Based Vision (in conjunction with ECCV ’02). Copenhagen, Denmark. May 2002.

J. Coughlan and A.L. Yuille. “The g Factor: Relating Distributions on Features to Distributions on Images.” Neural Information Processing Systems (NIPS ‘01). Vancouver, Canada. December 2001.

A.L. Yuille, J. Coughlan and S. Konishi. “The KGBR Viewpoint-Lighting Ambiguity and its Resolution by Generic Constraint.” International Conference on Computer Vision (ICCV ’01). Vancouver, Canada. July 2001.

J. Coughlan and A.L. Yuille. “The Manhattan World Assumption: Regularities in Scene Statistics which Enable Bayesian Inference.” Neural Information Processing Systems (NIPS ‘00). Denver, CO. December 2000.

A.L. Yuille, J. Coughlan, S. C. Zhu and Y. Wu. “Order Parameters for Minimax Entropy Distributions: When does High-Level Knowledge Help?” Computer Vision and Pattern Recognition (CVPR ‘00). Hilton Head, SC. June 2000.

A.L. Yuille, J. Coughlan and S. M. Konishi. “The Generic Viewpoint Constraint Resolves the Generalized Bas Relief Ambiguity.” Conference on Information Sciences and Systems (CISS ’00). Princeton, NJ. March 2000.

J. Coughlan and A.L. Yuille. “Manhattan World: Compass Direction from a Single Image by Bayesian Inference.” International Conference on Computer Vision (ICCV ‘99). Corfu, Greece. September 1999.

J. Coughlan and A.L. Yuille. “Bayesian A* Tree Search with Expected O(N) Convergence Rates for Road Tracking.” Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR ‘99). York, England. July 1999.

A.L. Yuille and J. Coughlan. “High-Level and Generic Priors for Visual Search: When Does High-Level Knowledge Help?” Computer Vision and Pattern Recognition (CVPR ‘99). Fort Collins, CO. June 1999.

S. M. Konishi, A.L. Yuille, J. Coughlan and S.C. Zhu. “Fundamental Bounds on Edge Detection: An Information Theoretic Evaluation of Different Edge Cues.” Computer Vision and Pattern Recognition (CVPR ‘99). Fort Collins, CO. June 1999.

A.L. Yuille and J. Coughlan. “Order Parameters and Fundamental Bounds for Visual Search.” Conference on Information Sciences and Systems (CISS ’99). Baltimore, MD. March 1999.

J. Coughlan and A.L. Yuille. “A Phase Space Approach to Minimax Entropy Learning and the Minutemax Approximation.” Neural Information Processing Systems (NIPS ‘98). Denver, CO. December 1998.

A.L. Yuille and J. Coughlan. “Convergence Rates of Algorithms for Visual Search: Detecting Visual Contours.” Neural Information Processing Systems (NIPS ‘98). Denver, CO. December 1998.

J. Coughlan, A.L. Yuille, C. English, D. Snow. “Efficient Optimization of a Deformable Template using Dynamic Programming.” Computer Vision and Pattern Recognition (CVPR ‘98). Santa Barbara, CA. June 1998.

A.L. Yuille and J. Coughlan. “Twenty Questions, Focus of Attention, and A*: a Theoretical Comparison of Optimization Strategies.” Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR ‘97). Venice, Italy. May 1997.

R. Szeliski and J. Coughlan. “Hierarchical Spline-Based Image Registration.” Computer Vision and Pattern Recognition (CVPR ‘94). Seattle, WA. June 1994.

ABSTRACTS AND DEMONSTRATIONS

B. Biggs, C. Toth, T. Stockman, S. Tupy, J. Coughlan and B. Walker. "Audiom: an Auditory Web-Based Geographic Map Viewer Showing COVID-19 State Data and a Travel Map." International Conference on Auditory Display (ICAD) 2022. Virtual conference. June 2022.

J. Coughlan, B. Biggs and H. Shen. "Point and Listen: Bringing a 3D Map to Life with Audio-Based AR." *Frameless:* Vol. 4: Iss. 1, Article 9. Available at https://scholarworks.rit.edu/frameless/vol4/iss1/9 . Presented at 6th Annual Frameless XR Symposium, Rochester Institute of Technology. Rochester, NY. Nov. 2021. PMCID: PMC9132217

E. Tekin, J. Coughlan and H. Simon. "Visual information can aid in speech enhancement." HEaring Across the Lifespan (HEAL 2014). Cernabbio, Lake Como, Italy. Jun. 5-7, 2014.

H. Shen, G. Fusco and J. Coughlan. "A Guidance System for Blind Pedestrians at Traffic Intersections." 29th Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 2014.

E. Tekin, J. Coughlan and H. Simon. "Improving speech enhancement algorithms by incorporating visual information." 166th Meeting of the Acoustical Society of America. San Francisco, CA. Dec. 2013.

E. Tekin, J. Coughlan and H. Shen. "An LED/LCD Display Reader For Visually Impaired Users." 26th Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 2011.

E. Tekin, J. Coughlan and H. Shen. "A System for Reading Non-Document Text for Persons with Vision Disabilities." 25th Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 2010.

V. Ivanchenko, H. Shen and J. Coughlan. "Crosswatch: a System to Help Visually Impaired Pedestrians Find and Traverse Crosswalks." 25th Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 2010.

J. Coughlan. "Using a Camera Phone to Find and Read Signs for the Visually Impaired." Biomedical Engineering Society Annual Fall Meeting, BMES 2007. Los Angeles, CA. Sept. 2007.

P. Verghese and J. Coughlan. "Evolution of a motion trajectory over time." Vision Sciences Society. Sarasota, Florida. May 2007.

L. W. Renninger, P. Verghese and J. Coughlan. "Eye movements can be understood within an information theoretic framework." Cosyne 2005. Salt Lake City, Utah. March 2005.

L. W. Renninger, P. Verghese and J. Coughlan. "Modeling eye movements in a shape discrimination task." Vision Sciences Society. Sarasota, Florida. May 2005.

NON-PEER-REVIEWED PUBLICATIONS

R. Manduchi, J. Coughlan and K. Miesenberger. "Guest editorial." Journal of Assistive Technologies, Vol. 7, Issue 2. 2013.

E. Tekin and J. Coughlan. "BLaDE: Barcode Localization and Decoding Engine." Technical Report 2012-RERC.01. Dec. 2012.

J. Coughlan and H. Shen. "An Embarrassingly Simple Speed-Up of Belief Propagation with Robust Potentials." Submitted to arXiv on Sept. 30, 2010. arXiv:1010.0012v1

A.L. Yuille, J. Coughlan and S. C. Zhu. "A Unified Framework for Performance Analysis of Bayesian Inference." SPIE (The International Society for Optical Engineering) AeroSense International Symposium on Aerospace/Defense Sensing, Simulation, and Controls. Orlando, FL. April 2000.

A.L. Yuille and J. Coughlan. "Visual Search: Fundamental Bounds, Order Parameters, and Phase Transitions." Proc. of IEEE workshop on Statistical and Computational Theories of Vision. Fort Collins, CO. June 1999.

A.L. Yuille and J. Coughlan. "Detecting Visual Contours: Fundamental Performance Bounds and Algorithmic Complexity." Workshop on Perceptual Organization in Computer Vision. Santa Barbara, CA. June 1998.

BOOK CHAPTERS

J. Coughlan and R. Manduchi. "Camera-Based Access to Visual Information." In **Assistive Technology for Blindness and Low Vision**. R. Manduchi and S. Kurniawan (eds.). CRC Press, a Taylor & Francis Group. Boca Raton, FL. 2013.

J. Coughlan. "Mechanisms for propagating surface information in 3-D reconstruction." In **Computer Vision: From Surfaces to 3D Objects.** Ed. C.W. Tyler. Chapman and Hall/CRC Press, Chapter 3. 2011.

J. Coughlan and A.L. Yuille. "A Large Deviation Theory Analysis of Bayesian Tree Search." In **Mathematical Methods in Computer Vision**. Eds. P. Olver and A. Tannenbaum. IMA Volumes in Mathematics and its Applications, Volume 133, pp. 1-17. Springer-Verlag New York Inc., 2003.

A.L. Yuille and J. Coughlan. "From Generic to Specific: An Information Theoretic Perspective on the Value of High-Level Information." In **Probabilistic Models of the Brain: Perception and Neural Function**. Eds. R. P. N. Rao, B. A. Olshausen, and M. S. Lewicki. pp. 135-154. MIT Press, 2002.

FUNDED RESEARCH

PI on Administrative Supplement to Enhance Software Tools for Open Science for "Point and Listen: Augmented Reality Interfaces for the Visually Impaired." NIH grant no. 3R01EY025332-06S1 (9/1/23-8/31/24), co-funded by the Office of Data Science Strategy (ODSS) and the National Eye Institute (NEI). Total award: $200,350.

Co-PI on "Translational Research in Functional Vision and Accessibility." NIH grant no. 1R13EY035565-01 (8/1/23-7/31/24). Total award: $33,600.

PI on "Rehabilitation Engineering Research Centers (RERC) Program: RERC on Blindness and Low Vision." NIDILRR grant no. 90REGE0018-01-00 (9/1/22-8/31/27). Total award: $4,625,000.

PI on "Point and Listen: Augmented Reality Interfaces for the Visually Impaired." NIH grant no. 2R01EY025332-05A1 (9/1/22-2/28/26). Total award: $1,734,798.

PI on “Cross-Sensory Digital Map Project Development.” NIDILRR Field Initiated Projects grant no. 90IFDV0020-01-00 (9/1/20-8/31/23). Total award: $599,342.

PI on COVID Supplement for “Leveraging Maps and Computer Vision to Support Indoor Navigation for Blind Travelers.” NIH grant no. 3R01EY029033-03S1 (9/30/20 – 3/31/21). Total award: $406,525.

PI on Diversity Supplement for “Leveraging Maps and Computer Vision to Support Indoor Navigation for Blind Travelers.” NIH grant no. 3R01EY029033-02S1 REVISED (9/1/19 – 8/31/20). Total award: $105,337.

Sub-contract PI on “ZoomBoard: an Affordable, Portable System to Improve Access to Presentations and Lecture Notes for Low Vision Viewers.” Research to Prevent Blindness (RPB)/ Reader's Digest Partners for Sight Foundation (RDPFS) Innovations in Technology Low Vision Research Award (08/1/18 – 07/31/19). Total award: $53,240.

PI on “Leveraging Maps and Computer Vision to Support Indoor Navigation for Blind Travelers.” NIH grant no. 1R01EY029033-01 (4/1/18 – 3/31/22). Total award: $1,665,496.

PI on “EAGER: Collaborative Research: Malleable Media to Support Interaction through Bi-Directional Touch Displays.” NSF grant no. 1741312 (09/1/17 – 08/31/19). Total award: $73,794.

PI on “Enabling Audio-Haptic Interaction with Physical Objects for the Visually Impaired.” NIH grant no. 1 R01 EY025332-01A1 (3/10/16 - 2/29/20). Total award: $1,666,296.

PI on “Providing Access to Appliance Displays for Visually Impaired Users.” NIH grant no. 2 R01 EY018890-04 (9/1/13 - 8/31/16). Total award: $1,128,246.

Co-inv. on "Video-based Speech Enhancement for Persons with Vision and Hearing Loss" (PI: Ender Tekin, co-inv.: Helen Simon). NIH Grant no. 1 R21 EY022200-01A1 (6/1/13 - 5/31/15).

Sub-contract PI on “Vision Without Sight: Exploring the Environment with a Portable Camera” (PI: Roberto Manduchi). NIH Grant no. 1 R21 EY021643-01 (9/30/11 - 8/31/13). Total sub-contract award: $199,491.

PI on “A Cell Phone-Based Street Intersection Analyzer for Visually Impaired Pedestrians.” NIH grant no. 2 R01EY018345-04 (3/1/11 - 2/28/14). Total award: $1,223,455.

PI on “A Cell Phone-based Sign Reader for Blind and Visually Impaired Persons.” NIH grant no. 1 R01 EY018210-01A1 (09/1/09 - 08/31/11). Total award: $826,747.

PI on “A Non-Document Text and Display Reader for Visually Impaired Persons.” NIH grant no. 1 R01 EY018890-01 (04/1/08 - 03/31/11). Total award: $1,280,991.

PI on “A Cell Phone-Based Street Intersection Analyzer for Visually Impaired Pedestrians.” NIH grant no. 1R01EY018345-01 (9/1/07 - 8/31/10). Total award: $1,027,295.

PI on “Wayfinding for the Blind and Visually Impaired Using Passive Environmental Labels.” NIH grant no. R21 EY017003-01A1 (9/30/06 - 8/31/08). Total award: $423,775.

PI on “Traffic Intersection Analysis Algorithms for the Blind.” NIH grant no. R21 EY015187-01A2 (4/1/05 – 3/31/07). Total award: $472,424.

PI on “Computer Vision-Based Terrain Sensors for Blind Wheelchair Users.” NSF grant no. IIS0415310 (9/15/04-9/14/07). Total award: $682,156.

PATENTS

R. Szeliski and J. Coughlan. A method for registering two or more images using spline displacement functions. US Patent #05611000 issued March 1997.

ORAL PRESENTATIONS

"Touch, Look and Listen: How Audio-based Augmented Reality can Help Individuals with Visual Impairments Explore a 3D Map." Jampolsky Fellows & Scientists Meeting. Nov 8, 2023.

"Perspectives of Individuals with Disabilities in Vision Research." ARVO 2023 Session on "Representation Matters: The Value of Diversity and Inclusion in Vision Research." April 23, 2023. https://www.arvo.org/annual-meeting/program/arvo-nei-deia-discussion/

"New Projects at Smith-Kettlewell on Blindness and Low Vision." 38th Annual CSUN Assistive Technology Conference. Mar 14, 2023. https://www.csun.edu/cod/conference/sessions/index.php/public/presentations/view/1457

"Smith-Kettlewell's Rehabilitation Engineering Research Center (RERC) on Blindness and Low Vision." Keynote for Sight Tech Global In Person. Dec 9, 2022. https://sighttechglobal.com/sight-tech-global-in-person-agenda-december-9/?mc_cid=1171c7d549&mc_eid=a0658ff2e3

"The Active Perception Loop: The Foundation of Vision-Based Accessibility." In "AVA: Accessibility, Vision, and Autonomy Meet" Workshop, a satellite of Computer Vision and Pattern Recognition (CVPR) 2022. Jun 20, 2022. https://accessibility-cv.github.io/index.html

"Point and Listen: Bringing a 3D Map to Life with Audio-Based AR." 6th Annual Frameless XR Symposium. Nov 18, 2021. https://www.rit.edu/framelesslabs/symposium-2021

"Tactile Graphics Helper." Wireless Inclusive RERC State of the Technology Forum 2021. Mar 23, 2021. http://www.wirelessrerc.gatech.edu/state-technology-forum-2021-0

"CamIO: an Audio-based AR Audio Labeling App for Visually Impaired Users." XR Access Symposium 2020. Jul 20, 2020. https://2020xraccesssymposium.splashthat.com/

"Non-Visual Ways to Explore, Interact with and Move in the Environment." Co-presenter at Jewish High Tech Community. Palo Alto, CA. Jun 9, 2020. https://www.jhtc.org/skeri/

"A Computer Vision-Based Wayfinding Aid for Visually Impaired Travelers." UC Berkeley Vision Science Oxyopia seminar. Berkeley, CA. Feb 24, 2020.

"Indoor Localization using Computer Vision and Visual-Inertial Odometry." Wichita State University. EECS Dept. seminar. Wichita, KS. Apr 5, 2019.

"CamIO: an App for Audio Labeling of Physical Objects." 34th Annual International Technology & Persons with Disabilities Conference. Anaheim, CA. March 14, 2019.

"A New Smartphone-Based Approach for Supporting Indoor Navigation." LightHouse Labs. San Francisco, CA. Aug. 8, 2018.

"Indoor Localization for Blind Travelers using Computer Vision" and "Access to Graphics and Physical Objects" in "Innovations in Blind Access" session. Association for Education and Rehabilitation of the Blind and Visually Impaired (AER) International Conference 2018. Reno, NV. July 25, 2018.

"Computer Vision as an Accessibility Tool for People with Visual Impairments." 2018 ImageXD Workshop, hosted by the Berkeley Institute for Data Science (BIDS) at UC Berkeley. May 17, 2018.

"Using Computer Vision to Support Accessibility for People with Visual Impairments." Graduate Seminar in Computer Science, San Francisco State University. Oct 25, 2017.

"AR4VI: AR as an Accessibility Tool for People with Visual Impairments." AR for Good Workshop, in conjunction with IEEE Int'l Symposium on Mixed and Augmented Reality. Nantes, France. Oct 9, 2017.

"Leveraging maps and computer vision to support indoor navigation for blind travelers." Beyond GPS: Marine Symposium on Wayfinding. UC Santa Cruz. July 14, 2017.

"CamIO: A System for Providing Audio-Haptic Access to Physical Objects." 32nd Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 3, 2017.

"Using Computer Vision to Support Accessibility for People with Visual Impairments." Rehabilitation Research at NIH: Moving the Field Forward. Bethesda, MD. May 25-26, 2016.

"An Appliance Display Reader for People with Visual Impairments." 31st Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 24, 2016.

"A Mobile System to Help Blind Persons Find Indoor Signs." 31st Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 24, 2016.

17th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2015). Lisbon, Portugal. Oct. 28, 2015.

Invited talk: "Applications of Computer Vision for Visual Impairment: Lessons Learned." Google Tech Talk. Mountain View, CA. Oct. 9, 2014.

11th Conference on Computer and Robot Vision (CRV 2014). Montréal, Canada. May 7, 2014.

Invited talk: "Computer Vision-Based Assistive Technology for the Visually Impaired." Andrea Bocelli Foundation (ABF) – MIT Challenges Workshop. Cambridge, MA. Dec. 6, 2013.

ICME 2013 Workshop on Multimodal and Alternative Perception for Visually Impaired People (MAP4VIP). San Jose, CA. July 15, 2013.

Invited talk: "Computer Vision-Based Assistive Technology for the Visually Impaired." Association for Research in Vision and Ophthalmology (ARVO) 2013. Seattle, WA. May 9, 2013.

"S-K Smartphone Barcode Reader for the Blind."28th Annual International Technology & Persons with Disabilities Conference. San Diego, CA. March 1, 2013.

Invited talk: "Computer Vision-Based Assistive Technology for the Visually Impaired." City College of New York/Georgia Tech. Joint Workshop on Man, Machine and Motor Control (M3C) for the Blind. Aug. 9, 2012.

13th International Conference on Computers Helping People with Special Needs (ICCHP '12). Linz, Austria. July 11, 2012.

Guest lecture: “Markov random fields and techniques for performing inference with them.” Presented for “Image Analysis and Computer Vision” (CMPE 264) course at UC Santa Cruz. Mar. 13, 2012.

Prof. Serge Belongie’s computer vision group meeting. UC San Diego. Oct. 5, 2009.

3rd European eAccessibility Forum: Mobile communications helping people with disabilities at work. Paris, France. Mar. 30, 2009.

AFOSR (Air Force Office of Scientific Research) Workshop on Surface Representation in Mid-Level Vision. Smith-Kettlewell. San Francisco, CA. Nov. 1, 2008.

SUNY-OPT colloquium. New York, NY. Sept. 22, 2008.

Nokia Research Center colloquium. Palo Alto, CA. Aug. 26, 2008.

11th International Conference on Computers Helping People with Special Needs (ICCHP ’08). Linz, Austria. July 9, 2008.

Guest lecture for course: “Universal Access: Disability, Technology, and Society.” UC Santa Cruz. Feb. 15, 2008.

Conference and Workshop on Assistive Technology for People with Vision and Hearing Impairments (CVHI '07). Granada, Spain. August 29, 2007.

Minnesota Laboratory for Low-Vision Research. Minneapolis, MN. June 22, 2007.

PARC vision colloquium. Palo Alto, CA. March 22, 2007.

10th International Conference on Computers Helping People with Special Needs (ICCHP ’06). Linz, Austria. July 14, 2006.

Workshop on Embedded Computer Vision, in conjunction with CVPR 2006. New York. June 18, 2006.

1st International Workshop on Mobile Vision, in conjunction with ECCV 2006. Graz, Austria. May 13, 2006.

2nd Workshop on Applications of Computer Vision, in conjunction with ECCV 2006. Graz, Austria. May 12, 2006.

Smith-Kettlewell Eye Research Institute, Colloquium seminar. San Francisco, CA. April 14, 2005.

UC Santa Cruz, Computer Engineering department seminar. Santa Cruz, CA. April 8, 2005.

Stanford University, Computer Science department seminar. Palo Alto, CA. May 24, 2004.

Bay Area Vision Meeting. HP Laboratories. Palo Alto, CA. March 4, 2004.

Bay Area Vision Meeting. UC Santa Cruz. Santa Cruz, CA. June 11, 2003.

UC Santa Cruz, Computer Engineering department seminar. Santa Cruz, CA. May 21, 2003.

Florida State University, The School of Computational Science and Information Technology (CSIT) and the Department of Statistics. Tallahassee, Florida. February 25, 2003.

Honda Research Institute USA, Inc. Mountain View, CA. February 6, 2003.

University of British Columbia, Department of Electrical and Computer Engineering. May 23, 2002.

Johns Hopkins University, Center for Imaging Science. April 2, 2002.

Second International Workshop on Statistical and Computational Theories of Vision (SCTV '01, in conjunction with ICCV '01). Vancouver, Canada. July 13, 2001.

University of Minnesota, Departments of Psychology and Computer Science. February 14, 2001.

Bayes 2001 Meeting, Smith-Kettlewell Institute. January 8-12, 2001.

Seventh San Francisco Bay Area Vision Meeting, Smith-Kettlewell Institute. San Francisco , CA. December 8, 2000.

Neural Information Processing Systems (NIPS '00). Denver, CO. December 2000.

Workshop on Recognition/Identification/Tracking of People and Deformable Objects. Fifth San Francisco Bay Area Vision Meeting, SRI International. December 1999.

Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR '99). York, England. July 1999.

Computer Vision Group Seminar. New York University, May 1999.

Pattern Theory and Vision Seminar. Brown University, Dept. of Applied Math. May 1999.

Laboratory for Information and Decision Systems Seminar. MIT. May 1999.

Vision colloquium. Xerox Parc Palo Alto Research Center. April 1999.

Workshop on Probabilistic Aspects in Computer Vision. Fourth San Francisco Bay Area Vision Meeting. Stanford University. March 1999.

Departmental colloquium. UC Berkeley, Computer Science Department. February 1999.

REVIEWS

ACM CHI Conference on Human Factors in Computing Systems (CHI 2014, 2015, 2017, 2018, 2019, 2020, 2023)

ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2014, 2016, 2017, 2018, 2019)

ACM Symposium on User Interface Software and Technology (UIST 2014, 2015)

ACM Transactions on Accessible Computing (2014, 2015, 2019, 2022)

Assistive Technology

US Army Medical Research and Materiel Command (USAMRMC)/ American Institute of Biological Sciences scientific peer grant review, 2009

Canadian Conference on Computer and Robot Vision (CRV 2010)

Computer Vision and Image Understanding

Computer Vision and Pattern Recognition (CVPR 2003-2007, 2009-2015)

Department of Transportation/National Academy of Sciences Review panelist, 2014

Department of Veterans Affairs Rehabilitation Research and Development Scientific Merit Review, 2008

Veterans Affairs Rehabilitation Research and Development Scientific Merit Review Board, Sensory Systems and Communication Disorders Panel, Feb. 2014.

Eye Tracking Research & Applications (ETRA 2010)

European Conference on Computer Vision (ECCV 2008)

IEEE Computer Graphics and Applications (2015)

IEEE Sensors Journal

IEEE Transactions on Biomedical Engineering

IEEE Transactions on Image Processing

IEEE Transactions on Multimedia

IEEE Transactions on Neural Systems & Rehabilitation Engineering

IEEE Transactions on Pattern Analysis and Machine Intelligence

IEEE Transactions on Pattern Analysis and Machine Intelligence: Special Issue on Perceptual Organization in Computer Vision

International Conference on Computer Vision (ICCV 2009)

International Conference on Image Analysis and Processing

International Conference on Multimodal Interfaces (ICMI 2006)

International Conference on Pattern Recognition (ICPR 2008)

International Journal of Computer Vision

International Journal of Image and Graphics, 2008

International Retinal Research Foundation, 2021

International Journal of Optomechatronics, 2013

JOSA A (Journal of the Optical Society of America A)

Journal of Enabling Technologies, 2018

Journal of Pattern Recognition Research, 2013

Journal of Vision

Journal on Technology & Persons with Disabilities, 2019-2023

Mobile Information Systems Journal, 2019

NIH/NEI Grant Review Panels, 2018

NIH SBIR Grant Review Panels, 2011, 2015, 2017

NSF Grant Review Panels, 2007, 2011

Neural Information Processing Systems (2000, 2001, 2002, 2004, 2005, 2006, 2007)

Optometry and Vision Science

Perception

SIGGRAPH 2007

State of Pennsylvania Department of Health scientific peer grant review, 2010

Transportation Research Part F: Traffic Psychology and Behaviour, 2014

US-Israel Binational Science Foundation

Vision Research

Workshop on Embedded Computer Vision (ECVW 2006), in conjunction with CVPR 2006

Workshops on Generative Model-Based Vision: GMBV ’02 (in conjunction with ECCV ‘02) and GMBV ’04 (in conjunction with CVPR ’04)

Workshop on Statistical and Computational Theories of Vision (SCTV ’99, in conjunction with CVPR ‘99)

PROFESSIONAL ACTIVITIES

Panel of Chairs for the Scientific Track, CSUN 2024 Conference/Journal on Technology and Persons with Disabilities. March 2024.

Co-Organizer, Functional Vision and Accessibility (FVA) Conference. San Francisco, CA. Aug 3-4, 2023. https://www.ski.org/FVAconference

Panel of Chairs for the Scientific Track, CSUN 2023 Conference/Journal on Technology and Persons with Disabilities. March 2023.

Co-Presenter, Workshop on “Tactile Maps for All.” Sight Tech Global In Person. San Jose, CA. Dec 9, 2022. https://sighttechglobal.com/sight-tech-global-in-person-agenda-december-9/?mc_cid=1171c7d549&mc_eid=a0658ff2e3

Panelist, 2022 VizWiz Grand Challenge Workshop (CVPR 2022). June 2022.

Co-Chair, Web4All 2022 Doctoral Consortium. Lyon, France. April 2022.

Courtesy appointment, Professor Computer Science, Virginia Commonwealth University. Sept 2021 – Sept 2024.

NIH National Advisory Eye Council member. Jun 2020 – Nov 2023.

Scientific Committee Chair Member, ICCHP-AAATE (International Conference on Computers Helping People with Special Needs and Association for the advancement of Assistive Technology in Europe) 2022 Joint Conference on Digital Inclusion, Assistive Technology & Accessibility. Lecco, Italy. July 2022.

Program Committee, 1st Workshop on Mobile and Pervasive Assistive Technologies (MPAT), in conjunction with PerCom 2021. (Virtual conference.) March 2021.

Scientific Chair, Conference on Information and Communication Technologies for Health, Accessibility and Well-Being (IHAW 2020). Rouen, France. Dec 2020. (Conference canceled.)

Technical Program Committee, 8th International Workshop on Assistive Computer Vision and Robotics (ACVR), in conjunction with the European Conference on Computer Vision 2020. Glasgow, UK. Aug 2020.

Panelist, NEI's Individual Quality of Life Strategic Planning Panel. Spring 2020.

Program Chair, 17th International Conference on Computers Helping People with Special Needs (ICCHP 2020). Virtual conference. Sept 2020.

Scientific Program Review Committee of the 35th Annual CSUN Assistive Technology Conference Scientific/Research Journal Track. March 2020.

Program Committee, 21st ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2019). Pittsburgh, PA. Oct 2019.

Technical Program Committee, 6th International Workshop on Assistive Computer Vision and Robotics (ACVR), in conjunction with the European Conference on Computer Vision 2018. Munich, Germany. Sept 2018.

Program Committee, 20th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2018). Galway, Ireland. Oct 2018.

Co-organizer, Special Thematic Session on Environmental Sensing Technologies for Visual Impairment, in conjunction with ICCHP 2018 (16th International Conference on Computers Helping People with Special Needs). Linz, Austria. July 2018.

Program Committee, 16th International Conference on Computers Helping People with Special Needs. Linz, Austria. July 2018.

Technical Program Committee, 5th International Workshop on Assistive Computer Vision and Robotics (ACVR), in conjunction with the International Conference on Computer Vision 2017. Venice, Italy. Oct 2017.

Program Committee, 19th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2017). Baltimore, MD. Oct 2017.

Ph.D. Dissertation Referee for Andrea Gerino, "Mobile assistive technologies for people with visual impairment: sensing and conveying information to support orientation, mobility and access to images." Dept. of Computer Science, University of Milan, Italy. 2016.

Scientific Committee, 7th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion (DSAI '16). Vila Real, Portugal. Dec 2016.

Technical Program Committee, 4th International Workshop on Assistive Computer Vision and Robotics (ACVR), in conjunction with the European Conference on Computer Vision 2016. Amsterdam, The Netherlands. Oct 2016.

Program Committee, 18th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2016). Reno, Nevada. Oct 2016.

Co-organizer, Special Thematic Session on Environmental Sensing Technologies for Visual Impairment, in conjunction with ICCHP 2016 (15th International Conference on Computers Helping People with Special Needs). Linz, Austria. July 2016.

Program Committee, 15th International Conference on Computers Helping People with Special Needs. Linz, Austria. July 2016.

Panelist for "Access to the Lived Environment" session, Rehabilitation Research at NIH: Moving the Field Forward. Bethesda, MD. May 25-26, 2016.

Technical Program Committee, 3rd International Workshop on Assistive Computer Vision and Robotics (ACVR), in conjunction with the International Conference on Computer Vision 2015. Dec. 13-16, 2015.

Program Committee, 17th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2015). Lisbon, Portugal. Oct. 26-28, 2015.

Scientific Committee, 6th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-Exclusion (DSAI '15). Sankt Augustin, Germany. June 2015.

Ph.D. Dissertation Referee for Dragan Ahmetovic, "Mobile device-driven navigation in urban environments for people with visual impairments through the usage of computer vision and motion sensors." Dept. of Computer Science, University of Milan, Italy. 2014.

Program Committee, 16th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2014). Rochester, NY. Oct. 20-22, 2014.

Technical Program Committee, Second Workshop on Assistive Computer Vision and Robotics (ACVR 2014), in conjunction with ECCV 2014 (European Conference on Computer Vision). Zurich, Switzerland. Sept. 12, 2014.

Co-organizer, Special Thematic Session on Portable and Mobile Systems in Assistive Technology, in conjunction with ICCHP 2014 (14th International Conference on Computers Helping People with Special Needs). Paris, France. July 2014.

International Program Committee, 14th International Conference on Computers Helping People with Special Needs. St. Denis, France. July 2014.

Scientific/Research Track Review Panel, 29th Annual International Technology and Persons with Disabilities Conference California State University, Northridge (CSUN 2014). March 17 – March 22, 2014.

Program Committee, 15th ACM SIGACCESS International Conference on Computers and Accessibility (ASSETS 2013). Bellevue, WA. Oct. 21-23, 2013.

Co-organizer, Workshop on Environmental Sensing Technologies for Visual Impairment (ESTVI 13). San Francisco, CA. Aug. 9, 2013.

Program Committee, IEEE Workshop on Multimodal and Alternative Perception for Visually Impaired People (MAP4VIP). San Jose, CA. July 15-19, 2013.

Review Panel Member, 28th Annual International Technology and Persons with Disabilities Conference California State University, Northridge (CSUN 2013). February 25 - March 2, 2013.

Co-organizer, Special Thematic Session on Portable and Mobile Systems in Assistive Technology, in conjunction with ICCHP 2012 (13th International Conference on Computers Helping People with Special Needs). Linz, Austria. July 2012.

International Program Committee, 13th International Conference on Computers Helping People with Special Needs. Linz, Austria. July 2012.

Program Committee, 9th Canadian Conference on Computer and Robot Vision (CRV 2012). Toronto, Ontario. May 2012.

Program Committee, 1st International Workshop on Information Theory in Computer Vision and Pattern Recognition, in conjunction with ICCV 2011. Barcelona, Spain. Nov. 2011.

Program Committee, 8th International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR). Saint Petersburg, Russia. July 2011.

Program Committee, 8th Canadian Conference on Computer and Robot Vision (CRV 2011). St. John's, Newfoundland. May 2011.

Co-chair, 3rd Workshop on Computer Vision Applications for the Visually Impaired (CVAVI '10), in conjunction with CVPR 2010. San Francisco, CA. June 14, 2010.

Co-organizer, Special Thematic Session on Mobility and Interaction without Sight, in conjunction with ICCHP 2010 (11th International Conference on Computers Helping People with Special Needs). Vienna, Austria. July 2010.

Program Committee, 7th Canadian Conference on Computer and Robot Vision (CRV 2010). Ottawa, Ontario. June 2010.

Program Committee, 5th IEEE Workshop on Embedded Computer Vision, in conjunction with ICCV 2009. Kyoto, Japan. Oct. 2009.

Program Committee, 7th International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR). Bonn, Germany. August 2009.

Tutorial presenter at Sixth Canadian Conference on Computer and Robot Vision (CRV 2009). Kelowna, British Columbia. May 2009.

Program Committee, 3rd European eAccessibility Forum. March 2009. Paris, France.

Co-chair, Workshop on Computer Vision Applications for the Visually Impaired (CVAVI ’08), in conjunction with European Conference on Computer Vision (ECCV ’08). Marseille, France. Oct. 18, 2008.

Technical Committee, 19th International Conference on Pattern Recognition (ICPR ’08). Tampa, Florida. Dec. 2008.

Co-organizer, Special Thematic Session on Portable and Mobile Systems in Assistive Technology, in conjunction with ICCHP 2008 (11th International Conference on Computers Helping People with Special Needs). Linz, Austria. July 2008.

International Program Committee (IPC), IASTED (International Association of Science and Technology for Development) International Conference on Assistive Technologies (AT 2008). Baltimore. April 2008.

Organizer, Session on Computer Vision Applications for the Visually Impaired, in OSA (Optical Society of America) Fall Vision Meeting. Berkeley, CA. Sept. 2007.

Program Committee, Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR ’07). EZhou, Hubei, China. August 2007.

Program Committee, Computer Vision and Pattern Recognition (CVPR ’07). Minneapolis, Minnesota. June 2007.

Program Committee, Workshop on Graph-based Representations in Pattern Recognition (GbR ’07, in conjunction with The International Association for Pattern Recognition). June 2007. Alicante, Spain.

Workshop on Perceptual Organization in Computer Vision (POCV ’06, in conjunction with CVPR ’06). New York, NY. June 2006.

Invited participant, NSF Human-Centered Computing (HCC) Workshop. Arlington, VA. Sept. 2006.

Program Committee, Workshop on Perceptual Organization in Computer Vision (POCV ’06, in conjunction with CVPR ’06). New York, NY. June 2006.

Program Committee, Computer Vision and Pattern Recognition (CVPR ’06). New York, NY. June 2006.

Co-chair, 1st IEEE Workshop on Computer Vision Applications for the Visually Impaired (CVAVI ’05), in conjunction with CVPR ’05. San Diego, CA. June 20, 2005.

NSF Grant Review Panelist. Arlington, VA. 2005.

Program Committee, Computer Vision and Pattern Recognition (CVPR ’05). San Diego, CA. June 2005.

Program Committee, Computer Vision and Pattern Recognition (CVPR ’04). Washington, DC. July 2004.

Program Committee, Second International Workshop on Generative-Model-Based Vision GMBV ’04, in conjunction with CVPR ’04). Washington, DC. July 2004.

Program Committee, Computer Vision and Pattern Recognition (CVPR ’03). Madison, Wisconsin. June 2003.

Program Committee, Statistical Analysis in Computer Vision (in conjunction with CVPR ’03). Madison, Wisconsin. June 2003.

Program Committee, First International Workshop on Generative-Model-Based Vision (in conjunction with ECCV ’02). Copenhagen, Denmark. May 2002.

MISCELLANEOUS

Co-author of tutorial for Shed Skin, an open source optimizing Python-to-C++ compiler. M. Dufour and J. Coughlan. “Shed Skin Tutorial.” https://code.google.com/archive/p/shedskin/wikis/docs.wiki