Carlo Tomasi

The Iris Einheuser Professor of Computer Science
Department of Computer Science — Levine Science Research Building
Duke University — Durham, NC 27708
tomasi@cs.duke.edu

Education and Work Experience

- Duke University, Full Professor, 2004–present.
- Duke University, Chair of the Department of Computer Science, 2010–2014.
- Duke University, Associate Professor, 2001–2004.
- Canesta, Inc., Software Architect, 2001–2004.
- Stanford University, Assistant Professor, 1994–2001.
- Cornell University, Assistant Professor, 1991–1993.
- Carnegie Mellon University, PhD, 1985–1991. Thesis on *Shape and Motion from Image Streams: a Factorization Method*. Advisor Prof. T. Kanade.
- University of Padua, Italy, Doctorate 1984–1987. Thesis on *Communication Issues in Distributed Computing Systems* (in italian). Advisor Prof. G. Cariolaro.
- University of Massachusetts at Amherst, MS in Electrical and Computer Engineering, 1982–1984. Thesis on *Modular and Multiplier-Free Digital Filters*. Advisor Prof. L. E. Franks.
- University of Padua, Italy, "Laurea" degree with honors in Electrical Engineering, 1976–1981. Thesis on *Pseudorandom Sequences for Spread Spectrum Communications Systems* (in italian). Advisor Prof. S. Pupolin.

Students Graduated

- Ergys Ristani, PhD, 2018. *Multi-Target, Multi-Camera Tracking*.
- Cassandra Carley, PhD, 2018. *Visual Analysis of Human Activity*.
- Rolando Estrada, PhD, 2013. *Tree Topology Estimation*.
- Susanna Ricco, PhD, 2013. *Video Motion: Finding Complete Motion Paths for Every Visible Point*.
- Zhiqiang (Steve) Gu, PhD, 2012. *Extended Subwindow Search and Pictorial Structures*.
- Tingting Jiang, PhD, 2007. *Tracking Dynamic Boundaries with Evolving Curves*.
- Daniel Russakoff, PhD, 2003. *2D-3D Registration Methods for Medical Imaging*.
- Michael Lin, PhD, 2002. *Surfaces with Occlusions from Layered Stereo*.
- Salih Burak Gokturk, PhD, 2001. *Shape Recognition with Applications to Medical Imaging*.
- Mark Ruzon, PhD, 1999. *Early Vision Using Distributions*.
- John Zhang, PhD, 1999. *The Computation of Camera Heading*.
- Stan Birchfield, PhD, 1999. *Depth and Motion Discontinuities*.

- Tong Zhang, PhD 1998 (co-advised with Gene Golub). *Methods for Computational and Statistical Estimation with Applications*.
- Yossi Rubner, PhD 1998. *Perceptual Metrics for Image Database Navigation*.
- Seda Vural, MS, 2009. *Semi-Supervised Fisher Linear Discriminant.*
- Christopher J. La Pilla, MS, 2008. *An Audiovisual Interface for Offline Data- Driven Music Synthesis.*
- Ran Liu, MS, 2007. *Tracking lesions in dermatological images.*
- Matthew Mason, MS, 2006. *Motion models in head tracking.*
- Haoying Li, MS, 2004. *Just-in-Time Constraints for Dynamic-Programming Stereo*.
- Paul Shealy, MS, 2004. *Real-Time Hand Location for Gesture Recognition*.
- Arvind Sastry, MS, 2004. *Feature Design for Gesture Recognition*.
- Anagha Gupte, MS, 2004. *Automatic Segmentation of Melanocytic Lesions*.

Teaching

- Elements of Machine Learning, Duke, Fall 2018, 2019.
- Introduction to Computer Vision, Duke, each Spring 2003–2006, Fall 2007-2009, 2011-2019; Stanford, each Winter 1995–2000 and Cornell, Fall 1992.
- Discrete Mathematics, Duke, Fall 2005 and 2006, Spring 2015-2017.
- Computational Modeling for the Sciences, Duke, each Spring 2007–2009.
- Mathematical Modeling of Continuous Systems, Duke, each Fall 2002–2004 and Stanford, each Fall 1994–2000.
- Topics in Computer Vision, Stanford, each Spring 1994–2000.
- Broad-Area Colloquium for AI, Geometry, Graphics, Robotics, and Vision (coordination of weekly seminars throughout the year), 1999–2000.
- Principles of Experimentation for Robotics and Vision, Stanford, Spring 1994.
- Foundations of Artificial Intelligence, Cornell, Fall 1991.
- Practicum of Artificial Intelligence, Cornell, Fall 1991.
- Introduction to Computer Science, Cornell, Spring 1992–1993.
- Lecture series on Stochastic Estimation Theory, Carnegie-Mellon University, Fall 1990.

Awards

- ACM Fellowship, awarded in 2016.
- The Iris Einheuser Distinguished Professorship, Duke University, 2016.
- IEEE Computer Society Helmholtz Prize, 2013. With Yossi Rubner and Leonidas J. Guibas, for the ICCV 1998 paper *A metric for distributions with applications to image databases*. This prize is given to two ICCV papers published at least ten years before the award and that have had significant impact on computer vision research.
- IEEE Computer Society Helmholtz Prize, 2013. With Roberto Manduchi, for the ICCV 1998 paper *Bilateral filtering for gray and color images*. This prize is given to two ICCV papers published at least ten years before the award and that have had significant impact on computer vision research.

- David and Janet Vaughan Brooks Teaching Award, Duke University, 2009-2010. Given to four teachers in the Trinity College of Arts and Sciences.

Referee and Conference Organization Work

- Reviewer, ACM Heidelberg Laureate Forum, 2017-2021.
- General program co-chair for the 2005 IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- Area chair for the International Conference on Computer Vision (ICCV), 2017.
- Area chair for the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 1999, 2003, 2004, 2007, 2014, and 2017.
- Co-editor, special CVIU issue on Emerging Techniques and Benchmarks for Video Surveillance Big Data, 2017.
- Co-chair, CVPR Workshop on Target Re-Identification and Multi-Target Multi-Camera Tracking, 2017.
- Area chair for the European Conference on Computer Vision (ECCV), 2012, 2020.
- Co-chair, CVPR Workshop on 3D Sensors and their Use, 2004 and 2005.
- Program committee member for
  - International Conference on Computer Vision (ICCV), 1995, 1998, 2003, and 2009. *Outstanding reviewer award* in 2009 (given to 23 out of 723 reviewers).
  - European Conference on Computer Vision, ECCV, 2006, 2008.
  - International Conference on Machine Vision and Machine Learning (MVML) 2014.
  - Dynamic 3D Imaging Workshop, 2009.
  - International Conference on Computer Vision Theory and Applications, VISAPP, Funchal, Portugal, 2008.
  - 3rd International Symposium on 3D Data Processing, Visualization, and Transmission, UNC Chapel Hill, 2006.
  - Vision, Modeling, and Visualization Conference, Erlangen, Germany, 2005.
  - IEEE CVPR Motion Workshop, San Diego, CA, 2005.
  - 2nd IEEE CVPR Workshop on Human-Computer Interaction, San Diego, CA, 2005.
  - 2nd International Symposium on 3D Data Processing, Visualization and Transmission, Thessaloniki, Greece, 2004.
  - IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 1993 and 1997.
- Co-organizer, National Science Foundation Workshop for Robotics and Computer Vision, 2003.
- Reviewer, National Science Foundation grant review panels, 1994, 1998, 1999, 2003, 2004, 2007, 2009, 2012.
- Associate editor for the SIAM Journal of Matrix Analysis and Applications (SIMAX), 1996-1998.
- Referee for several Computer Vision and Graphics conferences (CVPR, ICCV, IJCAI, SIGGRAPH), and for the following Journals: Nature; International Journal of Computer Vision; Journal of Mathematical Imaging and Vision; IEEE Transactions on Pattern Analysis and Machine Intelligence; Computer Vision, Graphics, and Image Processing; Computer Vision and Image Understanding; IEEE Transactions on Robotics and Automation; Pattern Recognition Letters; IEEE Transactions on Circuits and Systems.

Research Grants

- Principal Investigator: *Domain Adaptation for Satellite Image Analysis*. Sub-Contract of IARPA CORE3D Grant to Applied Research Associates, Inc., 2019-2021.
- Principal Investigator: *RI: Small: Lightly Supervised Deep Learning for Multi-Frame Visual Motion Analysis*. NSF , 2019-2022.
- Co-Investigator: *AF: Medium: Collaborative Research: Algorithmic Foundations for Trajectory Collection Analysis*. NSF , 2015-2018. With P. Agarwal (Duke) and L. Guibas (Stanford).
- Principal Investigator: *RI: Small: Global, Stable Descriptors of Visual Motion*. NSF , 2014-2018. Also REU supplement.
- Principal Investigator: *Multiscale path metrics for the analysis of discrete geometric structures*. ARO , 2016-2017.
- Principal Investigator: *NRI: Small: Expert-Apprentice Collaboration*. NSF , 2012-2017. With R. Parr (Duke).
- Principal Investigator: *RI: Small: The Shape of Visual Motion*. NSF, 2010-2013.
- Principal Investigator: *Sensing and Efficient Inference for Identity Management*. ARO, 2010-2014.
- Principal Investigator: *RI: Small: Visual Parts for Image and Video Analysis*. NSF, 2009-2010.
- Principal Investigator: *Inference for Identity Management*. ARO, 2009-2010.
- Principal Investigator: *Manos Teatrales (Theatrical Hands): Cyber-Paleography and a Virtual World of Spanish Golden Age Theater*. National Endowment for the Humanities, 2009–2010. Supported in part by an American Council of Library Sciences Digital Innovation Fellowship, 2010. With M. R. Greer (Duke).
- Co-Investigator: *Manos Teatrales*. Duke Provost Common Fund, 2008–2009. With M. R. Greer (Duke).
- Co-Investigator: *Doctoral Program in Management and Analysis of Large Data Sets Acquired from Sensors*. Department of Education, 2007-2010. With Richard Lucic (PI), Susan Rodger, Jeff Chase, Ronald Parr, Jeff Forbes, Shivnath Babu, Carla Ellis, Jun Yiang, David Bell, John Harer, Martha Absher (Duke).
- Principal Investigator: *Visual Learning in Context*. NSF, 2005–2008.
- Principal Investigator: *Stereo Matching for DARPA's Grand Challenge*. SAIC, 2005–2008.
- Principal Investigator: *CRI: A Core Experimental Facility for Computer Vision and Artificial Intelligence*. NSF CISE Research Infrastructure Grant, with Ronald Parr, CS, Duke, 2005-2007.
- Principal Investigator: *Computing a Semantic View of a Scene for Surveillance from Stereo and Discreet LIDAR*, Phase I Army SBIR, subcontract from Intelligent Automation, Inc., 2005-2006. With Ronald Parr (Duke).
- Principal Investigator: *Using Evolving Curves to Track Dynamic Boundaries*. Phase II Army STTR Grant (Army03-T08) with Vikram Manikonda, Intelligent Automation, Inc., 2004–2006.
- Principal Investigator: *Tracking Level Sets*. NSF, 2004.
- Principal Investigator: *Stereo Matching*. SAIC, 2002–2004.
- Principal Investigator: *Randomized Invariant Features for Recognition*. NSF, 2002–2005. Collaboration with Roberto Manduchi, UCSC.

- Co-Investigator: *Using Evolving Curves to Track Dynamic Boundaries*. Phase I Army STTR grant. Subcontracted, with Vikram Manikonda, Intelligent Automation, Inc., 2003.
- Principal investigator: *Imaging and Learning Techniques for the Detection of Anomalous Structures in 3D Medical Images*. Stanford Bio-X Inter Disciplinary Initiatives Program, 2000-2002.
- Co-investigator: *CT Colonography*. NIH. 1999-2001.
- Principal investigator: *Motion Discontinuities from an Image Sequence*. ST Microelectronics, 2000-2001.
- Principal Investigator: *Vision for P4*. Honda, 2000-2001.
- Principal investigator: *The Sensitivity of Structure From Motion: A Comprehensive Theoretical and Experimental Study*. NSF, 1999–2002.
- Co-investigator: *Immersive Television*. Sony-Intel-Interval, 1998–2001.
- Principal investigator: *Exploring Image Data-Bases Using Novel Similarity Metrics*. NSF, 1997–2000.
- Principal investigator: *A Vision System for American Sign Language Interpretation*. Intel, 1997–2000.
- Co-investigator: *Intelligent Assistants for Joint-Force Crisis-Response*. US Navy MURI, 1996–99.
- Principal Investigator: *From Optical Flow to Image Deformations*. NSF, 1995–98.
- Co-investigator: *Algorithmics of Motion*. MURI. 1995–2002.
- Principal investigator: *Asteroid Shape Reconstruction from Remote Images*. JPL 1995.
- Principal Co-investigator: *The Multilinear Tensor in Image Sequence Analysis*. US-Israel BSF, 1995–98.
- Principal Co-investigator: *Robust Visual Detection and Recognition of Moving Objects in Real Time*. STTR, 1995. With J. B. Burns, Teleos Research.
- Principal Co-investigator: *Remote Intelligent Observer*. NSF-CONACyT, 1995–97.
- Principal Co-investigator: *Autonomous Intelligent Observer*. STTR ARPA, 1994.
- Principal investigator: *Image Representations for Browsing and Retrieval*. ARPA, 1994–98.
- Co-investigator: *CISE Research Instrumentation* Grant, NSF, 1994.
- Principal investigator: *The Factorization Method for Image Sequence Analysis*. NSF, 1992–95.
- Co-investigator: *Research in Mobile Autonomous Robotic Motion, Sensing, and Planning in Unstructured Environments*. NSF , 1992.

Patents

- A. Rafii, S. B. Gokturk, C. Tomasi, and F. Surucu. Gesture recognition system using depth perceptive sensors. United States Patent 10,242,255, March 26, 2019.
- A. Rafii, S. B. Gokturk, C. Tomasi, and F. Surucu. Gesture recognition system using depth perceptive sensors. United States Patent 9,959,463, May 1, 2018.
- S. B. Gokturk, C. Bamji, A. Rafii, C. Tomasi and X. Liu. System and method for providing intelligent airbag deployment. United States Patent 7,526,120 B2, April 28, 2009.

- S. B. Gokturk, C. Tomasi, B. Acar, C. F. Beaulieu, D. S. Paik, and S. A. Napel. Three-dimensional pattern recognition method to detect shapes in medical images. United States Patent 7,346,209, March 18, 2008.
- S. B. Gokturk and C. Tomasi and F. Surucu and A. Rafii. Gesture recognition system using depth perceptive sensors. United States Patent 7,340,077 B2, March 4, 2008.
- S. B. Gokturk and C. Tomasi and F. Surucu. Optical methods for remotely measuring objects. United States Patent 7,310,431, December 18, 2007.
- B. Acar, C. F. Beaulieu, S. B. Gokturk, C. Tomasi, D. S. Paik, R. Brooke Jeffrey, and S. A. Napel. Method for detecting and classifying a structure of interest in medical images. United States Patent 7,272,251, September 18, 2007.
- C. Tomasi and S. B. Gokturk. Method and apparatus for approximating depth of an object's placement onto a monitored region with applications to virtual interface devices. United States Patent 7,050,177, May 23, 2006 and United States Patent 7,006,236, February 28, 2006.
- C. Tomasi and A. Rafii. Quasi-three-dimensional method and apparatus to detect and localize interaction of user-object and virtual transfer device. United States Patent 6,710,770, March 23, 2004.
- C. Tomasi and F. Surucu. Method and apparatus for approximating a source position of a sound-causing event for determining an input used in operating an electronic device. United States Patent 6,690,618, February 10, 2004.

Publications

- S. Yu and C. Tomasi. Identity Connections in Residual Nets Improve Noise Stability. *Workshop on Understanding and Improving Generalization in Deep Learning, International Conference on Machine Learning*, June 14, 2019.
- C. Carley and E. Ristani and C. Tomasi. Person Re-Identification from Gait using an Autocorrelation Network. *Biometrics Workshop, IEEE Conference on Computer Vision and Pattern Recognition*, 2019.
- E. Ristani and C. Tomasi. Features for Multi-Target Multi-Camera Tracking and Re-Identification. *IEEE Conference on Computer Vision and Pattern Recognition*, pages 6036–6046, 2018.
- S. G. Prakalapakorn, L. A. Vickers, R. Estrada, S. F. Freedman, C. Tomasi, S. Farsiu, and D. K. Wallace. Using an Image Fusion Methodology to Improve Efficiency and Traceability of Posterior Pole Vessel Analysis by ROPtool. *The Open Ophthalmology Journal*, 11:143–151, 2017.
- F. Solera, S. Calderara, E. Ristani, C. Tomasi, and R. Cucchiara. Tracking social groups within and across cameras. *IEEE Transactions on Circuits and Systems for Video Technology*, 27(3):441–453, 2017.
- E. Ristani, F. Solera, R. Zou, R. Cucchiara, and C. Tomasi. Performance measures and a data set for multi-target, multi-camera tracking. *ECCV Workshop on Benchmarking Multi-Target Tracking*, Springer LNCS 9914:17–35, 2016.
- R. S. Zou and C. Tomasi. Deformable graph model for tracking epithelial cell sheets in fluorescence microscopy. *IEEE Transactions on Medical Imaging*, 35(7):1625–1635, 2016.
- B. Burchfiel, C. Tomasi, and R. Parr. Distance minimization for reward learning from scored trajectories. *AAAI Conference on Artificial Intelligence*, pages 3330–3336, 2016.
- C. Carley and C. Tomasi. Single-frame indexing for 3D hand pose estimation. *ICCV Workshop on Assistive Computer Vision and Robotics*, pages 493–501, 2015.

- R. Estrada, M. J. Allingham, P. S. Mettu, S. W. Cousins, C. Tomasi, and S. Farsiu. Retinal artery-vein classification via topology estimation. *IEEE Transactions on Medical Imaging*, 34(12):2518–2534, 2015.
- R. Estrada, C. Tomasi, S. C. Schmidler, and S. Farsiu. Tree topology estimation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 37(8):1688–1701, August 2015.
- E. Ristani and C. Tomasi. Tracking multiple people online and in real time. *Asian Conference on Computer Vision*, pages 444–459, November 2014.
- S. Ricco and C. Tomasi. Video motion for every visible point. *International Conference on Computer Vision*, pages 2464–2471, December 2013.
- H. C. Hendargo, R. Estrada, S. J. Chiu, C. Tomasi, S. Farsiu, and J. A. Izatt. Automated non-rigid registration and mosaicing for robust imaging of distance retinal capillary beds using speckle variance optical coherence tomography. *Biomedical Optics Express*, 4(6):803–821, May 2013.
- J. Salas and C. Tomasi. A linear system form solution to compute the local space average color. *Machine Vision and Applications*, pages 1555-1560, October 2013.
- S. Ricco and C. Tomasi. Simultaneous compaction and factorization of sparse image motion matrices. *European Conference on Computer Vision*, pages 456–469, October 2012.
- Y. Zheng, S. Gu, and C. Tomasi. Fast tiered labeling with topological priors. *European Conference on Computer Vision*, pages 587–601, October 2012.
- S. Gu, Y. Zheng, and C. Tomasi. Nested pictorial structures. *European Conference on Computer Vision*, pages 816–827, October 2012.
- S. Ricco and C. Tomasi. Dense Lagrangian motion estimation with occlusions. *IEEE Conference on Computer Vision and Pattern Recognition*, pages 1800–1807, June 2012.
- S. Gu, Y. Zheng, and C. Tomasi. Twisted window search for efficient shape localization. *IEEE Conference on Computer Vision and Pattern Recognition*, pages 167–173, June 2012.
- S. Gu, Y. Zheng and C. Tomasi. Oscillation regularization. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, pages 3837–3840, March 2012.
- S. Gu, Y. Zheng and C. Tomasi. Shape from point features. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, pages 1425–1428, March 2012.
- Y. Zheng, S. Gu, and C. Tomasi. Topological persistence on a Jordan curve. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, pages 3693–3696, March 2012.
- R. Estrada, C. Tomasi, M. T. Cabrera, D. K. Wallace, S. F. Freedman, and S. Farsiu. Exploratory Dijkstra forest based automatic vessel segmentation: applications in video indirect ophthalmoscopy (VIO). *Biomedical Optics Express*, 3(2):327–339, January 2012.
- C. Tomasi. Visual reconstruction. *Communications of the ACM*. 54(10):104, 2011.
- R. Estrada, C. Tomasi, M. T. Cabrera, D. K. Wallace, S. F. Freedman, and S. Farsiu. Enhanced video indirect ophthalmoscopy (VIO) via robust mosaicing. *Biomedical Optics Express*. 2(10), pages 2871–2887, 2011.
- Y. Zheng, S. Gu, and C. Tomasi. Detecting motion synchrony by video tubes. *International Conference on Multimedia*. Pages 1197–1200, 2011.
- S. Gu, Y. Zheng, and C. Tomasi. Linear time offline tracking and lower envelope algorithms. *International Conference on Computer Vision*. Pages 1840–1846, 2011.
- Y. Zheng, S. Gu, H. Edelsbrunner, C. Tomasi, and P. Benfey. Detailed reconstruction of 3D plant root shape. *International Conference on Computer Vision*. Pages 2026–2033, 2011.

- S. Gu and C. Tomasi. Branch and Track. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. Pages 271–282, 2011.
- S. Gu, Y. Zheng, and C. Tomasi. Extended pairwise potentials. *CVPR Workshop on Inference in Graphical Models with Structured Potentials*. 2011.
- Joaquín Salas and C. Tomasi. People Detection Using Color and Depth Images. *Mexican Conference on Pattern Recognition*. Pages 127–135, 2011.
- S. Gu and Y. Zheng and C. Tomasi. Efficient Visual Object Tracking with Online Nearest Neighbor Classifier matching. *Asian Conference on Computer Vision (ACCV)*. Pages 267–277, 2010.
- S. Gu and Y. Zheng and C. Tomasi. Critical nets and beta-stable features for image matching. *European Conference on Computer Vision (ECCV)*. Pages 663–676, 2010.
- R. Estrada, C. Tomasi, D. K. Wallace, S. F. Freedman and S. Farsiu. Software-Based Method for Acquiring Enhanced, Panoramic Images Through Video Indirect Ophthalmoscopy for Evaluation of Retinopathy of Prematurity (ROP). *Annual meeting of the Association for Research in Vision and Ophthalmology (ARVO)* (abstract), 2010.
- R. Estrada and C. Tomasi. A bleed-through and show-through ground truth database construction methodology. Submitted to the *IEEE International Journal on Document Analysis and Recognition*, 2010.
- S. Remus and C. Tomasi. Semi-supervised Fisher Linear Discriminant (SFLD). *IEEE International Conference on Acoustics, Speech and Signal Processing*. Pages 1862–1865, 2010.
- S. Ricco and C. Tomasi. Fingerspelling recognition through classification of letter-to-letter transitions. *9th Asian Conference on Computer Vision* , pages 214–225, 2009.
- R. Estrada and C. Tomasi. Manuscript bleed-through removal via hysteresis thresholding. *IEEE International Conference on Document Analysis and Recognition*, pages 753–757, 2009.
- S. Gu and C. Tomasi. Phase diffusion for the sychronization of heterogeneous sensor streams. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, pages 1841–1844, 2009.
- T. Jiang and C. Tomasi. Robust shape normalization based on implicit representations. *International Conference on Pattern Recognition*, December, pages 1–4, 2008.
- T. Jiang and C. Tomasi. Finite-element level-set curve particles. *ICCV Workshop on Non-rigid Registration and Tracking through Learning*, pages 1–7, October, 2007.
- C. Tomasi. Global stereo in polynomial time. In L. Harris and M. Jenkin, editors. *Computational Vision in Neural and Machine Systems*, Cambridge University Press, pages 203–219, 2007.
- T. Jiang, C. Tomasi, and S. C. Schmidler. How to dispatch observers to track a moving boundary. *First ACM/IEEE International Conference on Distributed Smart Cameras*, pages 305–312, September 2007.
- J. M. Phillips, R. Liu, and C. Tomasi. Outlier Robust ICP for Minimizing Fractional RMSD. *6th International Conference on 3-D Digital Imaging and Modeling*, pages 427–434, August 2007.
- S. T. Birchfield, B. Natarajan, and C. Tomasi. Correspondence as energy-based segmentation. *Image and Vision Computing*, Vol. 25, No. 8, pages 1329–1340, August 2007.
- T. Jiang and C. Tomasi. Level-set curve particles. *European Conference on Computer Vision (ECCV)*, pages 633–644, 2006.
- C. Schmid, S. Soatto and C. Tomasi, editors. *IEEE Computer Society Conference on Computer Vision and Pattern Recognition*. IEEE Computer Society Press, Los Alamitos, CA, 2005.

- M. Fashing and C. Tomasi. Mean shift is a bound optimization. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 27, No. 3, pages 471–474, March 2005.
- M. H. Lin and C. Tomasi. Surfaces with occlusions from layered stereo. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 26, No. 8, pages 1073–1078, August 2004.
- P. Venkatesan, A. Gupte, C. Tomasi, and J. M. Grichnik. Center-based approach for computerized analysis of non-uniform growth patterns in melanocytic lesions. (Abstract) *The Journal of Investigative Dermatology* 122(3), page A158, March 2004.
- C. Tomasi. Past Performance and Future Results. *Nature* 408, page 378, March 2004.
- S. B. Göktürk and C. Tomasi. 3D Head Tracking Based on Recognition and Interpolation Using a Time-Of-Flight Depth Sensor. *Proceedings of the IEEE Computer Society Conference Computer Vision and Pattern Recognition, CVPR*, San Diego, CA, pages 211–217, June 2004.
- D. Russakoff, C. Tomasi, T. Rohlfing and C. Maurer. Image Similarity Using Mutual Information of Regions. *The 8th European Conference on Computer Vision - ECCV 2004*, Prague, Czech Republic, pages 596–607, May 2004.
- C. Tomasi, S. Petrov and A. Sastry. 3D tracking = classification + interpolation. *International Conference on Computer Vision (ICCV)*, pages 1441–1448, Nice, France, October 2003.
- C. Tomasi, A. Rafii and I. Torunoglu. Full-size projection keyboard for handheld devices. *Communications of the ACM*, 46(7), pages 70–75, July 2003.
- M. Lin and C. Tomasi. Surfaces with occlusions from layered stereo. *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 710–717, Madison, WI, June 2003.
- H. Roeber and J. Bacus and C. Tomasi. Typing in thin air: the Canesta projection keyboard — A new method of interaction with electronic devices. *Proceedings of the Conference on Human Factors in Computing Systems (CHI 2003)*, pages 712–713, Fort Lauderdale, FL, April 2003.
- B. Acar, C. F. Beaulieu, S. B. Göktürk, C. Tomasi, D. S. Paik, R. B. Jeffrey, Jr., J. Yee, and S. Napel. Edge Displacement Field Based Classification for Improved Detection of Polyps in CT Colonography. *IEEE Transactions on Medical Imaging*, 21(12), pages 1461–1467, December 2002.
- T. Zhang and C. Tomasi. On the Consistency of Instantaneous Rigid Motion Estimation. In *International Journal on Computer Vision*, 46(1), January 2002, pages 51–79.
- B. Göktürk, C. Tomasi, B. Acar, C. Beaulieu, D. Paik, R. Brooke Jeffrey, J. Yee, and S. Napel. A statistical 3D pattern processing method for computer aided detection of polyps in CT colonography. *IEEE Transactions on Medical Imaging* , 20(12), December 2001, pages 1251–1260.
- S. B. Göktürk and C. Tomasi. A New 3-D Pattern Recognition Technique With Application to Computer Aided Colonoscopy. In *Proceedings of the IEEE Computer Science Conference on Computer Vision and Pattern Recognition (CVPR)*, pages (1)93–100, Kauai, Hawaii, 2001.
- J. Hornegger and C. Tomasi. Image Warping for 3-D Reconstruction: Robustness and Efficiency. In Bildverarbeitung für die Medizin, pages 109–113, March 2001.
- Y. Rubner and C. Tomasi. *Perceptual Metrics for Image Database Navigation*. *Book:* Kluwer Academic Publishers, Boston, MA, 2001.
- Y. Rubner,J. Puzicha, C. Tomasi, and J. M. Buhmann. Empirical Evaluation of Dissimilarity Measures for Color and Texture. *Computer Vision and Image Understanding Journal*, 84(1):25-43, October 2001.

- M. A. Ruzon and C. Tomasi. Edge, Junction, and Corner Detection Using Color Distributions. In *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 23(11), November 2001, pages 1281–1295.
- B. Göktürk, C. Tomasi, B. Acar, D. Paik, C. Beaulieu, and S. Napel. A Learning Method for Automated Polyp Detection. In *Proceedings of the Medical Image Computing and Computer-Assisted Intervention Conference (MICCAI)*, Utrecht, The Netherlands, October 2001, pages 85–93.
- B. Acar, S. Napel, D. Paik, B. Göktürk, C. Tomasi, and C. Beaulieu. Using optical flow fields for polyp detection in virtual colonoscopy. In *Proceedings of the Medical Image Computing and Computer-Assisted Intervention Conference (MICCAI)*, Utrecht, The Netherlands, October 2001, pages 637–644.
- B. Acar, C. Beaulieu, D. Paik, B. Göktürk, C. Tomasi, J. Yee, and S. Napel. Assessment of an optical flow field-based polyp detector for CT colonography. In Proceedings of the 23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Istanbul, Turkey , October 2001.
- Y. Rubner and C. Tomasi and L. J. Guibas. The Earth Mover's Distance as a Metric for Image Retrieval. In *International Journal of Computer Vision*, 40(2) November 2000, pages 99–121.
- C. Tomasi and S. Burak Göktürk. A graph method for the conservative detection of polyps. *2nd International Symposium on Virtual Colonoscopy*, Boston, MA, October 2000, page 105.
- C. Tomasi. Early vision. In *Encyclopedia of Cognitive Sciences*, London, England, 2002. Nature Publishing Group, Macmillan Reference Limited.
- M. A. Ruzon and C. Tomasi. Alpha Estimation in Natural Images. In *Proceedings of the IEEE Computer Science Conference on Computer Vision and Pattern Recognition (CVPR)*, pages (1)24-31, Hilton Head Island, SC, June 2000.
- S. Birchfield and C. Tomasi. Depth discontinuities by pixel-to-pixel stereo. *International Journal on Computer Vision*, 35(3), December 1999, pages 269–293.
- C. Tomasi, J. Zhang and G. Golub. A resampling method for computer vision. In *Proceedings of the Ninth International Symposium on Robotics Research, ISRR '99*, Snowbird, CO, October 1999, pages 89–96. Invited paper.
- R. Manduchi and C. Tomasi. Distinctiveness maps for image matching. In *10th International Conference on Image Analysis and Processing (ICIAP)*, Venice, Italy, September 1999, pages 26–31.
- C. Tomasi and J. Zhang. How to rotate a camera. In *10th International Conference on Image Analysis and Processing (ICIAP)*, Venice, Italy, September 1999, pages 606–611.
- S. Birchfield and C. Tomasi. Multiway cut for stereo and motion with slanted surfaces. In *Seventh International Conference on Computer Vision (ICCV)*, Kerkyra, Greece, September 1999, pages 489–495.
- J. Hornegger and C. Tomasi. Representation issues in the ML estimation of camera motion. In *Seventh International Conference on Computer Vision (ICCV)*, Kerkyra, Greece, September 1999, pages 640–647.
- Y. Rubner and C. Tomasi. Texture-based image retrieval without segmentation. In *Seventh International Conference on Computer Vision (ICCV)*, Kerkyra, Greece, September 1999, pages 1018–1024.
- M. A. Ruzon and C. Tomasi. Corner detection in textured color images. In *Seventh International Conference on Computer Vision (ICCV)*, Kerkyra, Greece, September 1999, pages 1039–1045.

- J. Puzicha, Y. Rubner, C. Tomasi, and J. M. Buhmann. Empirical evaluation of dissimilarity measures for color and texture. In *Seventh International Conference on Computer Vision (ICCV)*, Kerkyra, Greece, September 1999, pages 1165–1172.
- M. A. Ruzon and C. Tomasi. Color edge detection with the compass operator. In *Proceedings of the IEEE Computer Science Conference on Computer Vision and Pattern Recognition (CVPR)*, pages II–160–166, Fort Collins, CO, June 1999.
- T. Zhang and C. Tomasi. Fast, robust, and consistent camera motion estimation. In *Proceedings of the IEEE Computer Science Conference on Computer Vision and Pattern Recognition (CVPR)*, pages I–164–170, Fort Collins, CO, June 1999.
- S. Birchfield and C. Tomasi. A Pixel Dissimilarity Measure That Is Insensitive to Image Sampling. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 20(4), pages 401–406, April 1998.
- Y. Rubner and C. Tomasi. Texture Metrics. *IEEE International Conference on Systems, Man, and Cybernetics*, San Diego, CA, October 1998, pages 4601–4607.
- H. H. González-Baños, L. Guibas, J. C. Latombe, S. M. LaValle, D. Lin, R. Motwani, and C. Tomasi. Motion Planning with Visibility Constraints: Building Autonomous Observers. *Proceedings of the Eighth International Symposium on Robotics Research*, Hayama, Japan, October 3-7, 1998, pp. 95–101. Invited paper.
- C. Tomasi and R. Manduchi. Stereo Matching as a Nearest-Neighbor Problem. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 20(3), pages 333–340, March 1998.
- Y. Rubner, C. Tomasi and L. J. Guibas. Adaptive Color-Image Embeddings for Database Navigation. *Proceedings of the Third Asian Conference on Computer Vision*, Hong Kong, pages 104–111, January 1998.
- J. Salas and J. L. Gordillo and C. Tomasi. Visual Routines for Mobile Robots. *Expert Systems with Applications*, Pergamon Press, volume 14 (1-2), January 1998, pages 187–197.
- C. Tomasi and R. Manduchi. Bilateral Filtering for Gray and Color Images. *Proceedings of the Sixth International Conference on Computer Vision (ICCV)*, Bombay, India, pp. 839–846, January 1998.
- Y. Rubner and C. Tomasi and L. Guibas. A Metric for Distributions with Applications to Image Databases. *Proceedings of the Sixth International Conference on Computer Vision (ICCV)*, Bombay, India, pp. 59–66, January 1998.
- S. Birchfield and C. Tomasi. Depth Discontinuities by Pixel-to-Pixel Stereo. *Proceedings of the Sixth International Conference on Computer Vision (ICCV)*, Bombay, India, pp. 1073–1080, January 1998.
- I. R. Nourbakhsh and D. Andre and C. Tomasi and M. R. Genesereth. Mobile Robot Obstacle Avoidance Via Depth From Focus. *Robotics and Autonomous Systems Journal*, Elsevier, volume 22, number 2, pages 151–158, November 1997.
- C. Tomasi and J. Shi. Image Deformations Are Better Than Optical Flow. *Mathematical and Computer Modeling Journal*, 24 (5/6), pp. 165–175, November 1996.
- T. Y. Tian, C. Tomasi, and D. J. Heeger. Comparison of approaches to egomotion computation. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, CA, June 1996, pp. 315–320.
- C. Tomasi and R. Manduchi, Stereo Without Search. *European Conference on Computer Vision (ECCV)*, Cambridge, UK, April 1996, volume I, pp. 452–465.
- C. Tomasi and J. Zhang. Is Structure-From-Motion Worth Pursuing? *Proceedings of the Seventh International Symposium on Robotics Research, ISRR '95*, Herrsching, Germany, October 1995, pages 391–400. Invited paper.

- C. Tomasi and J. Zhang and D. Redkey. Experiments With a Real-Time Structure-From-Motion System. *Proceedings of the Fourth International Symposium on Experimental Robotics, ISER '95*, Stanford, CA, June 1995, pp. 123–128.
- C.Becker and H.H. González-Baños and J.C. Latombe and C. Tomasi. An Intelligent Observer. *Proceedings of the Fourth International Symposium on Experimental Robotics, ISER '95*, Stanford, CA, June 1995, pp. 94–99.
- D. Weinshall and C. Tomasi. Linear and Incremental Acquisition of Invariant Shape Models from Image Sequences. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 17(5), May 1995, pp. 512–517. Also appears in the Fourth International Conference on Computer Vision, Berlin, Germany, May 1993, pp. 675–682, and as IBM computer science technical report RC18549 (# 81133), T.J. Watson Research Center, Yorktown Heights, NY, November 1992.
- L. Guibas and B. Rogoff and C. Tomasi. Fixed-Window Image Descriptors for Image Retrieval. *Proceedings of the SPIE Conference on Storage and Retrieval for Image and Video Databases*, pages 2420–2431. San Josè, CA, February 1995.
- C. Tomasi. Pictures and Trails: a New Framework for the Computation of Shape and Motion From Perspective Image Sequences. *IEEE Conference on Computer Vision and Pattern Recognition*, Seattle, WA, June 1994, pages 913–918.
- J. Shi and C. Tomasi. Good Features To Track. *IEEE Conference on Computer Vision and Pattern Recognition*, Seattle, WA, June 1994, pages 593–600.
- C. Tomasi and T. Kanade. Shape and Motion from Image Streams – A Factorization Method. *Proceedings of the National Academy of Sciences of the United States of America*. Washington, DC, Volume 90, Issue 21, pages 9795–9802, November, 1993.
- C. Tomasi. Input Redundancy and Output Observability in the Analysis of Visual Motion. *Sixth International Symposium on Robotics Research*, Pittsburgh, PA, October 1993, pages 213–222. Invited paper.
- C. Tomasi and J. Shi. Direction of Heading From Image Deformations. *IEEE Conference on Computer Vision and Pattern Recognition*, New York, NY, June 1993, pages 422–427.
- C. Tomasi and T. Kanade. Shape and Motion from Image Streams under Orthography: a Factorization Method. *International Journal on Computer Vision*, 9(2), pages 137–154, November 1992.
- C. Tomasi and T. Kanade. Factoring image sequences into shape and motion. *Proceedings of the IEEE Workshop on Visual Motion*, pages 21–28, Princeton, NJ, October 1991.
- C. Tomasi and T. Kanade. Shape and motion without depth. In *Proceedings of the Third International Conference on Computer Vision (ICCV)*, Osaka, Japan, December 1990, pages 91–95. Also appears in the *Proceedings of the DARPA Image Understanding Workshop*, pages 258–270, Pittsburgh, Pa, September 1990, and as technical report CMU-CS-90-128, Carnegie Mellon University, Pittsburgh, Pa, May 1990.