<div align="center">

George Bebis
Foundation Professor
Director of Computer Vision Laboratory (CVL)
Department of Computer Science and Engineering
University of Nevada, Reno (UNR)

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Research Interests

Computer Vision
Pattern Recognition
Deep/Machine Learning
Genetic Algorithms

Education

Ph.D. in Electrical & Computer Engineering
University of Central Florida, Orlando, FL 32816
Dissertation Topic: *Indexing-Based Object Recognition*.
Graduation: August 1996

Master of Science in Computer Science
University of Crete, Heraklion, Crete, Greece
Thesis topic: *Model Based Object Recognition using*
Multi-resolution Segmentation and Neural Network Models.
Graduation: July 1991

Bachelor of Science in Mathematics
University of Crete, Heraklion, Crete, Greece
Major Areas: *Numerical Analysis, Probability Theory and Statistics*
Graduation: September 1987

Academic Experience and Appointments

July 2018 - present, *Foundation Professor*
Department of Computer Science and Engineering, UNR

July 2013 – June 2018, *Professor and Chair*
Department of Computer Science and Engineering, UNR

July 2008 – June 2013, *Professor*
Department of Computer Science and Engineering, UNR

July 2013 – June 2016, *Director*

Cybersecurity Center, UNR

July 2002 - June 2008, *Associate Professor*
Department of Computer Science and Engineering, UNR

January 1998 - June 2002, *Assistant Professor*
Department of Computer Science and Engineering, UNR

July 1998 - August 1998, *Summer Faculty*
Center for Applied Scientific Computing (CASC), Lawrence Livermore National Laboratory

January 1998 - present, *Founder and Director*
Computer Vision Laboratory (CVL), UNR

August 1996 - August 1997, *Visiting Assistant Professor*
Department of Mathematics and Computer Science, University of Missouri-St. Louis (UMSL)

Teaching

CS 135 Computer Science I

CS 302 Data Structures

CS 365 Mathematics of Computer Science

CS 474/674 Image Processing

CS 477/677 Analysis of Algorithms

CS 479/679 Pattern Recognition

CS 480/680 Computer Graphics

CS 485/685 Computer Vision

CS 791Y Mathematical Methods for Computer Vision

CS 491/691 Topics in Computer Vision

CS 491/691 Topics in Machine Learning

CS 773C Machine Intelligence

CS 791S Neural Networks

Departmental and College Committee Services

Member, *CSE Bylaws Committee* (2022 - present)

Member, *CSE Colloquia Committee* (2022 - present)

Member, *CoEn Differential Fees Committee* (2018 - 2021)

Chair, *CSE Faculty Evaluations Committee* (2018-2020)

Chair, *CSE Differential Fees Committee* (2013-2018)

Graduate Director, *CSE Graduate Committee* (2005 – 2011)

Chair, *CSE Colloquia Committee* (1999 – 2003)

Chair, *CSE Strategic Plan Committee* (1999, 2003)

Chair, *CSE Assessment and Accreditation Committee* (2003, 2004, 2013)

Chair, *CSE Faculty Evaluations Committee* (1999, 2000, 2002-2004, 2007, 2013)

Member, *CSE Graduate Committee* (1999 – 2004)

Member, *CSE Strategic Plan Committee* (2001)

Member, *CoEn Dean's Search Committee* (2008)

Member, *CoEn Assessment Committee* (1999 - 2001)

Member, *Faculty Search Committee* (2001 - 2002, 2007 – 2008)

Member, *CSE Assessment and Accreditation Committee* (2002, 2008 – 2012)

Member, *CSE Personnel Committee* (2006 – 2009)

Member, *CoEn Personnel Committee* (2006 – 2009)

Member, *CoEn FACE Committee* (2009 – 2013)

Member, *CoEn Graduate Directors Committee* (2010 – 2011)

Member, *CME Promotion Committee* (2016)

Director/Co-Director, *UNR Cybersecurity Center* (2013 – 2017)

National, and International Committee Services

2002 - 2006, IAPR Education Committee (international)

2001 - Present, Nevada NASA Space Grant Consortium

Ph.D. Dissertations

Crater Detection, Ebrahim Emami, May 2019.

Machine Learning based Mountainous Skyline Detection and Visual Geo-Localization, Touqeer Ahmad, December 2017.

Network Security Monitoring and Analysis based on Big Data Technologies, Bingdong Li, December 2013 (co-advised with Mehmet Gunes).

Hand-Based Biometrics, Gholmareza Amayeh, May 2010.

Perceptual Grouping Using Tensor Voting, Leandro Loss, May 2009.

On-Road Vehicle Detection, Zehang Sun, Fall 2003.

Master Thesis

Automated detection of dune crest-lines in planetary satellite images, David LeBlanc, February 2017.

Retinal Vessel Segmentation using Tensor Voting, Dan Farmer, May 2015 (co-advised with Mircea Nicolescu).

Horizon Line Detection: Edge-less and Edge-based Methods, Touqeer Ahmad, December 2014.

Non-intrusive physical activity prediction for exergames, Miran Kim, May 2013 (co-advised with Eelke Folmer).

Feature Selection Using Genetic Algorithms for Human Gait Recognition, Faezeh Tafazzoli, May 2012.

Accurate and Robust Localization of Duplicated Region in Copy-Move Image Forgery, Maryam Jaberi, August 2012.

Computational Models for Regional and Mesoscale Air Quality Modeling in the United States, Julide Koracin, Spring 2009.

Gender Classification, Zhiming Liu, Spring 2007.

Fingerprint Template Synthesis, Tamer Uz, Spring 2006.

Improving the Performance of Fingerprint Classification, Uday Rajanna, Spring 2006.

Shape Metamorphism Using p-Laplacian Equation, Mehmet Eser, Spring 2005.

Geometric Approach to Segmentation and Protein Localization in Cell Cultured Assays, Sreevatsan Raman, Fall 2005.

Automatic Recognition of a Baby Gesture, Jigna Bhatt, Spring 2005.

Global Hand Pose Estimation by Multiple Camera Ellipse Tracking, Jorge Usabiaga, Spring 2005.

Rendering Optimizations Guided by Head-Pose Estimates and their Uncertainty, Javier Martinez, Summer 2005.

Face Recognition Experiments Using Random Projection, Navin Goel, Spring 2004.

Infrared and Visible Image Fusion for Face Recognition, Saurabh Singh, Spring 2004.

Heliothis-Zea Classification Using Image Analysis, Tom Patten, Spring 2004.

Face Detection Using Multi-Band Fusion, Jonathan Dowdall, Spring 2003.

Multiresolution Image Retrieval through Fusion, Vladimir Nikulin, Fall 2003.

Face Recognition Using Image Fusion, Aglika Gyaourova, Spring 2003.

Fingerprint Minutiae Extraction, Chris Smith, Fall 2002.

Computational Analysis of Functionally Unknown Proteins from Expressed Sequence Tags (EST) Datasets, Elham Alavi, Fall 2002.

Improving Fingerprint Recognition, Xiaosheng Tu, Summer 2000.

Genetic Search for Face Recognition, Satish Uthiram, Summer 1999.

Face Detection using Convex Grouping, Alexey Kryuchkov, Fall 1998.

Fingerprint Recognition using Delaunay Triangulation, Taisa Deaconu, Fall 1998.

Editorials

[4] George Bebis, Doron Levy, Russell Rockne, Ernesto Lima, and Panayiotis Benos, Advances in Mathematical and Computational Oncology", **Frontiers in Physiology**, April 2022.

[3] Paolo Spagnolo, Hamid Aghajan, George Bebis, Shaogang Gong, Amy Loutf,; Leonid Sigal, Wei-Shi Zheng"Large-Scale Visual Sensor Networks: Architectures and Applications", **IEEE Transactions on Circuits and Systems for Video Technology**, April 2021.

[2] Athanasios Voulodimos, Nikolaos Doulamis, George Bebis, and Tania Stathaki, "Recent Developments in Deep Learning for Engineering Applications", **Computational Intelligence and Neuroscience,** May 2018**.**

[1] N. Bourbakis and G. Bebis, "Digital Multimedia on Demand", **IEEE Multimedia,** January-March 2004.

Books Edited

[22] G. Bebis et. al (eds) Advances in Visual Computing, Lecture Notes in Computer Science (LNCS), Vols. 13598, 13599, 17th International Symposium, ISVC 2022, San Diego. CA, October 3-5, 2022.

[21] G. Bebis et. al (eds) Advances in Mathematical and Computational Oncology (papers), Lecture Notes in Bioinformatics (LNBI), Vol. 12508, 3rd International Symposium, ISMCO 2021 (virtual), October 7-9, 2021.

[20] G. Bebis et. al (eds) Advances in Visual Computing, Lecture Notes in Computer Science (LNCS), Vols. 13017, 13018, 16th International Symposium, ISVC 2021 (virtual), October 4-6, 2021.

[19] G. Bebis et. al (eds) Advances in Mathematical and Computational Oncology (abstracts), Frontiers, 2nd International Symposium, ISMCO 2020 (virtual), October 9-10, 2020.

[18] G. Bebis et. al (eds) Advances in Mathematical and Computational Oncology (papers), Lecture Notes in Bioinformatics (LNBI), Vol. 12508, 2nd International Symposium, ISMCO 2020 (virtual), October 9-10, 2020.

[17] G. Bebis et. al (eds) Advances in Visual Computing, Lecture Notes in Computer Science (LNCS), Vols. 12509, 12510, 15th International Symposium, ISVC 2020 (virtual), October 5-7, 2020.

[16] G. Bebis et. al (eds) *Advances in Mathematical and Computational Oncology* (abstracts), Frontiers, 1st International Symposium, **ISMCO 2019**, Lake Tahoe, Nevada, USA, October 14-16, 2019.

[15] G. Bebis et. al (eds) *Advances in Mathematical and Computational Oncology* (papers), Lecture Notes in Computer Science (LNCS), Vol. 11826, 1st International Symposium, **ISMCO 2019**, Lake Tahoe, Nevada, USA, October 14-16, 2019.

[14] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols. 11844, 11845, 14th International Symposium, **ISVC 2019,** Lake Tahoe, Nevada, USA, October 7-9, 2019.

[13] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols. 11241, 13th International Symposium, **ISVC 2018**, Las Vegas, Nevada, USA, Nov 19-21, 2018.

[12] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols. 10072, 10073, 12th International Symposium, **ISVC 2016**, Las Vegas, Nevada, USA, Dec 12-14, 2016.

11] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols. 9474, 9475, 11th International Symposium, **ISVC 2015**, Las Vegas, Nevada, USA, Dec 14-16, 2015.

[10] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols. 8887, 8888, 10th International Symposium, **ISVC 2014**, Las Vegas, Nevada, USA, Dec 8-10, 2014.

[9] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 8033, 8034, 9th International Symposium, **ISVC 2013**, Crete, Greece, July 29-31, 2013.

[8] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 7430, 7431, 8th International Symposium, **ISVC 2012**, Crete, Greece, July 16-18, 2012.

[7] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 6938, 6939, 7th International Symposium, **ISVC 2011**, Las Vegas, NV, USA, September 26-28, 2011.

[6] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 6453, 6454, 6455, 6th International Symposium, **ISVC 2010**, Las Vegas, NV, USA, November 29 - December 1, 2010.

[5] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 5875, 5876, 5th International Symposium, **ISVC 2009**, Las Vegas, NV, USA, November 30 - December 2, 2009.

[4] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 5358, 5359, 4th International Symposium, **ISVC 2008**, Las Vegas, NV, USA, December 1-3, 2008.

[3] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 4841, 4842, 3rd International Symposium, **ISVC 2007**, Lake Tahoe, NV, USA, November 26-28, 2007.

[2] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vols 4291, 4292, 2nd International Symposium, **ISVC 2006**, Lake Tahoe, NV, USA, November 6-8, 2006.

[1] G. Bebis et. al (eds) *Advances in Visual Computing*, Lecture Notes in Computer Science (LNCS), Vol. 3804, 1st International Symposium, **ISVC 2005**, Lake Tahoe, NV, USA, December 5-7, 2005.

Book Chapters

[4] K. Michalopoulos, G. Bebis, and N. Bourbakis, "Synthesizing 2D Ground Images for Maps Creation and Detecting Texture Patterns", In: Virvou M., Tsihrintzis G.A., Tsoukalas L.H., Jain L.C. (eds) **Advances in Artificial Intelligence-based Technologies. Learning and Analytics in Intelligent Systems**, vol 22. Springer, 2022.

[3] Tavakkoli, M. Nicolescu, J. Wang, and G. Bebis, "Background Learning with Support Vectors: Efficient Foreground Detection and Tracking for Automated Visual Surveillance", In Thierry Bouwmans, Fatih Porikli, Benjamin Hörlin, Antoine Vacavant (Ed.), **Background Learning with Support Vectors: Efficient Foreground Detection and Tracking for Automated Visual Surveillance**. CRC Press, Taylor and Francis, pages 11.1-11.23, June 2014.

[2] G. Bebis, "Fingerprint Indexing", **Biometrics Encyclopedia**, Springer-Verlag, 2009.

[1] G. Bebis, "Face Recognition in the Thermal Spectrum, **Biometrics Encyclopedia**, Springer-Verlag, 2009.

Journal Publications (peer reviewed)

[72] K. Asghar, M.Saddique, M. Hussain, G. Bebis, and Z. Habib "Image Forgery Detection Using Noise and Edge Weighted Local Texture Features", **Advances in Electrical and Computer Engineering**, 2022.

[71] Ashwaq Alotaibi, Muhammad Hussain,Hatim AboAlSamh, Wadood Abdul, and George Bebis, "Cross-Sensor Fingerprint Enhancement Using Adversarial Learning and Edge Loss", **Sensors**, vol. 22, no. 18, 2022.

[70] Adhwa Alrashidi, Ashwaq Alotaibi, Muhammad Hussain, Helala AlShehri, Hatim A. AboAlSamh, and George Bebis, "Cross-Sensor Fingerprint Matching Using Siamese Network and Adversarial Learning", **Sensors**, 2021.

[69] Duc Tran, Hung Nguyen, Uyen Le, George Bebis, Hung N. Luu, and Tin Nguyen, "A Novel Method for Cancer Subtyping and Risk Prediction Using Consensus Factor Analysis", **Frontiers in Oncology** (Advances in Mathematical and Computational Oncology), 2020.

[68] Touqeer Ahmad, George Bebis, Monica Nicolescu, Ara Nefian, and Terry Fong, "Horizon Line Detection using Supervised Learning and Edge Cues", **Computer Vision and Image Understanding** (CVIU), vol. 191, 2020.

[67] Ebrahim Emami, Touqeer Ahmad, George Bebis, Ara Nefian, and Terry Fong, "Crater Detection Using Unsupervised Algorithms and Convolutional Neural Networks", **IEEE Transactions on Geoscience and Remote Sensing**, vol. 57, no. 8, 2019.

[66] Yongjie Chu, Touqeer Ahmad, George Bebis, Lindu Zhao, "Low-resolution face recognition with single sample per person", **Signal Processing**, vol. 141, pp. 144-157, 2017.

[65] A. Yazdanpanah, E. Regentova and G. Bebis, "Algebraic Iterative Reconstruction-Reprojection (AIRR) Method for High Performance Sparse-View CT Reconstruction", **Applied Mathematics and Information Sciences**, vol. 10, no. 6, pp. 1-8, 2016.

[64] S. Khana, M, Hussain, H. Aboalsamhb, H. Mathkourb, G. Bebis, and M. Zakariahd, "Optimized Gabor features for mass classification in mammography", **Applied Soft Computing**, vol. 44, pp. 267-280, 2016.

[63] A. Alahmadi, M. Hussain, H. Aboalsamh, G. Muhammad, G. Bebis, and H. Mathkour, "Passive Detection of Image Forgery using DCT and Local Binary Pattern", **Signal, Image and Video Processing**, 2016 (accepted).

[62] C. Moujahdi, G. Bebis, S. Ghouzali, M. Mikram and M. Rziza, "Biometric Template Protection Using Spiral Cube: Performance and Security Analysis", **International Journal on Artificial Intelligence Tools**, vol. 25, no. 1, 2016.

[61] Shicai Yang, George Bebis, Yongjie Chua and Lindu Zhaoa "Effective Face Recognition Using Bag of Features with Additive Kernels", **Journal of Electronic Imaging**, (accepted) 2016.

[60] Salabat Khan, Muhammad Hussain, Hatim Aboalsamh and George Bebis, "A comparison of different Gabor feature extraction approaches for mass classification in mammography", **Multimedia Tools and Applications**, pp. 1-25, 2015.

[59] Touqeer Ahmad, George Bebis, Emma Regentova, Ara Nefian, and T. Fong, "Coupling Dynamic Programming with Machine Learning for Horizon Line Detection", **International Journal on Artificial Intelligence Tools**, vol. 24, no. 4, pp. 1-19, 2015.

[58] M. Jiang, J. Kong, G. Bebis, and H. Huo, "Informative joints based human action recognition using skeleton contexts", **Signal Processing: Image Communication**, vol. 33, pp. 29-40, 2015.

[57] Q. Tao, Z. Liu, G. Bebis, and M. Hussain, "Face Recognition Using a Novel Image Representation Scheme and Multi-Scale Local Features", **International Journal of Biometrics**, vol. 7, no. 3, pp. 191-212, 2015.

[56] F. Tafazzoli, G. Bebis, S. Louis, and M. Hussain, "Genetic Feature Selection for Gait Recognition", **Journal of Electronic Imaging**, vol. 24, no. 1, pp. 1-14, 2015.

[55] M. Hussain, S. Qasem, G. Bebis, G. Muhammad, H. Aboalsahm, and H. Mathkour, "Evaluation of Image Forgery Detection Using Multi-Scale Weber Local Descriptors", **International Journal on Artificial Intelligence Tools**, vol. 24, no. 4, pp. 1-28, 2015.

[54] A. Ambardekar, Mircea Nicolescu, G. Bebis, and Monica Nicolescu, "Vehicle Classification Framework: A Comparative Study", **EURASIP Journal on Image and Video Processing**, vol. 29, pp. 1-13, 2014.

[53] C. Moujahdi, G. Bebis, S. Ghouzali, and M. Rziza, Fingerprint Shell: Secure Representation of Fingerprint Template", **Pattern Recognition Letters**, vol. 45, pp. 189-196, 2014.

[52] G. Muhammad, M. Al-Hammadi, M. Hussain, G. Bebis, Image Forgery Detection Using Steerable Pyramid Transform and Local Binary Pattern", **Machine Vision and Applications**, vol 25, no 4, pp. 985-995, 2014.

[51] A. Ambardekar, Mircea Nicolescu, G. Bebis, and Monica Nicolescu, "A Visual Traffic Surveillance Framework: Classification to Event Detection", **Journal of Electronic Imaging**, Special Issue on "Video Surveillance and Transportation Imaging Applications", vol. 22, no. 4, 2014.

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[49] M. Jaberi, G. Bebis, M. Hussain, and G. Muhammad, Accurate and Robust Localization of Duplicated Region in Copy-Move Image Forgey", **Machine Vision and Applications**, vol. 25, pp. 451-475, 2014.

[48] M. Hussain, S. Khan, G. Muhammad, and G. Bebis, Effective Extraction of Gabor features for False Positive Reduction and Mass classification in Mammography", **Applied Mathematics and Information Sciences,** vol. 8, no. 1L, pp. 397-412, 2014.

[47] A. Mazoul, M. El Ansari, K. Zebbara and G. Bebis, Fast spatio-temporal stereo for intelligent transportation systems", **Pattern Analysis and Applications**, vol. 17, no. 1, 2014.

[46] Ihsan Ullah, Aboalsamh, H., Hussain, M., Muhammad, G., Mirza, A. M., Bebis, G., Gender Classification using Texture Descriptor", **Journal of Internet Technology**, vol. 15(5), pp.801-812, Sept, 2014.

[45] Amol Ambardekar, Mircea Nicolescu, George Bebis, and Monica Nicolescu, "A Visual Traffic Surveillance Framework: Classification to Event Detection", **Journal of Electronic Imaging**, Special Issue on "Video Surveillance and Transportation Imaging Applications", vol. 22, no. 4, pp. 1-17, 2013.

[44] B. Li, E. Erdin, M. Gunes, G. Bebis, and T. Shipley, "An Overview of Anonymity Technology Usage", **Computer Communications**, vol 36, no. 12, pp. 1269-1283. 2013
.
[43] B. Li, J. Springer, G. Bebis, and M. Gunes, "A Survey Of Network Flow Applications", **Journal of Networks and Computer Applications**, vol. 36, pp. 567-581, 2013.

[42] S. Yang, G. Bebis, M. Hussain, G. Muhammad, and A. Mirza, "Unsupervised Discovery of Visual Face Categories", **International Journal of Artificial Intelligence Tools**, vol. 22, no. 1, 2013.

[41] G. Muhammad, M. Hussain, F. Alenezy, G. Bebis, A. Mirza, and H. Aboalsamh, "Race Classification from Face Images Using Local Descriptors", **International Journal of Artificial Intelligence Tools**, vol. 21, no. 5, 2012.

[40] G. Muhammad, M. Hussain and G. Bebis, "Passive copy move image forgery detection using undecimated dyadic wavelet transform", **Digital Investigation**, vol. 9, pp. 49-57, 2012.

[39] L. Loss, G. Bebis, and B. Parvin, "Iterative Tensor Voting for Perceptual Grouping of Ill-Defined Curvilinear Structures", **IEEE Transactions on Medical Imaging**, vol. 30, no. 8, pp. 1503-1513, 2011.

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[37] U. Rajanna, A. Erol, and G. Bebis, "A Comparative Study on Feature Extraction for Fingerprint Classification and Performance Improvements Using Rank-Level Fusion", **Pattern Analysis and Applications**, vol. 13, no. 3, pp. 263-272, 2010.

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[34] A. Amayeh, G. Bebis, and M. Nicolescu, "Hand-based Verification and Identification Using Palm-Finger Segmentation and Fusion", **Computer Vision and Image Understanding Journal (CVIU)**, vol 113, pp. 477-501, 2009.

[33] J. Martinez, A. Erol, G. Bebis, R. Boyle, and X. Twombly, "Integrating Perceptual Level of Detail with Head Pose Estimates and their Uncertainty", **Machine Vision an Applications**, vol 21, no. 1, pp. 69-83, 2009.

[32] L. Loss, G. Bebis, M. Nicolescu, and A. Skurikhin, "An Iterative Multi-Scale Tensor Voting Scheme for Perceptual Grouping of Natural Shapes in Cluttered Backgrounds" **Computer Vision and Image Understanding (CVIU)**, vol. 113, no. 1, pp. 126-149, 2009.

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[26] A. Tavakkoli, Mircea Nicolescu, G. Bebis, and Monica Nicolescu, "A Support Vector Data Description Approach for Background Modeling in Videos with Quasi-Stationary Backgrounds", **International Journal of Artificial Intelligence Tools**, vol. 17, no. 4, pp. 635-658, 2008.

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[24] G. Bebis, A. Gyaourova, S. Singh, and I. Pavlidis, "Face Recognition by Fusing Thermal Infrared and Visible Imagery", **Image and Vision Computing**, vol. 24, no. 7, pp. 727-742, 2006.

[23] Z. Sun, G. Bebis, and R. Miller, "On-road Vehicle Detection: A review", **IEEE Transactions on Pattern Analysis and Machine Intelligence**, vol. 28, no. 5, pp. 694-711, 2006.

[22] Z. Sun, G. Bebis, and R. Miller, "Monocular Pre-crash Vehicle Detection: Features and Classifiers", **IEEE Transactions on Image Processing**, vol. 15, no. 7, pp. 2019-2034, July 2006.

[21] Z. Sun, G. Bebis, and R. Miller, "On-Road Vehicle Detection Using Evolutionary Gabor Filter Optimization", **IEEE Transactions on Intelligent Transportation Systems**, vol. 6, no. 2, pp. 125-137, 2005.

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[15] G. Bebis, S. Uthiram, and M. Georgiopoulos, "Face Detection and Verification Using Genetic Search", **International Journal on Artificial Intelligence Tools**, vol 9, no 2, pp. 225-246, 2000.

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[28] E. Yfantis, T. Lazarakis, G. Bebis, and G. Gallitano "A Computer Algorithm for Cancer Recognition on Ultrasound Images of Prostate Tissue", **IEEE International Conference on Information, Intelligence, and Systems**, pp. 34-39, Maryland, 1999.

[27] G. Bebis, S. Uthiram and M. Georgiopoulos, "Genetic Search for Face Detection and Verification", **IEEE International Conference on Intelligence, Information and Systems (ICIIS'99)**, pp. 360-368, Maryland, 1999.

[26] Qiang Ji and George Bebis, Visual Cues Extraction for Monitoring Driver's Vigilance, **First Honda Initiation Grant Forum: The HIG Symposium**, pp. 48-55, 1999.

[25] G. Bebis, M. Georgiopoulos, M. Shah, and N. da Vitoria Lobo, "Algebraic Functions of Views for Model-Based Object Recognition", **Sixth International Conference on Computer Vision (ICCV98)**, pp. 634-639, India, January 1998.

[24] G. Bebis, S. Louis, and S. Fadali, "Using Genetic Algorithms for 3D Object Recognition", **11th International Conference on Computer Applications in Industry and Engineering**, pp. 13-16, Las Vegas, November 1998.

[23] G. Bebis, George Papadourakis, and S. Orphanoudakis, "Recognition Using Curvature Scale Space and Artificial Neural Networks", **1998 Signal and Image Processing Conference**, pp. 613-618, Las Vegas, October 1998.

[22] S. Louis, G. Bebis. S. Uthiram, and Y. Varol, "Genetic Object Recognition", **7th Annual Conference on Evolutionary Programming**, LNCS 1447, V. Porto et. al (Eds.), pp. 199-208, San Diego, March 1998.

[21] S. Fadali and G. Bebis, "Control System Design for LTI Systems Using Interval Analysis",**13th International Conference on Computers and Their Applications**, Honolulu, Hawaii, March 1998.

[20] G. Bebis, S. Louis, and Y. Varol, "Using Genetic Algorithms for Model-Based Object Recognition", **1998 International Conference on Imaging Science, Systems, and Technology**, pp. 1-6, Las Vegas, July 1998.

[19] I. Dagher, M. Georgiopoulos, G. Heilman, and G. Bebis, "Fuzzy ARTVar: An Improved Fuzzy ARTMAP Algorithm", **1998 International Joint Conference on Neural Networks (IJCNN98)**, vol. 3, pp. 1688-1693, Alaska, May 4-9, 1998.

[18] I. Dagher, M. Georgiopoulos, G. Heilman, and G. Bebis, "Ordered Fuzzy ARTMAP: A Fuzzy ARTMAP algorithm with a fixed order", accepted, **1998 International Joint Conference on Neural Networks (IJCNN98)**, Vol. 3, pp. 1717-1722, Alaska, May 1998.

[17] G. Bebis, M. Georgiopoulos, and S. Bhatia, "Learning Orthographic Transformations for Object Recognition", **IEEE International Conference on Systems, Man, and Cybernetics**, vol. 4, pp. 3576-3581, Orlando, October 1997.

[16] G. Anagnostopoulos, M. Georgiopoulos, D. Nickerson, and G. Bebis, "Extending the Power of Linear Hybrid Ensemble Methods", **IEEE International Conference on Systems, Man, and Cybernetics**, vol. 2, pp. 1350-1355, Orlando, October 1997.

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[14] G. Bebis, M. Georgiopoulos, N. da Vitoria Lobo and M. Shah, "Learning Affine Transformations of the Plane for Model-based Object Recognition", **13th International Conference on Pattern Recognition (ICPR96)**, vol. IV, pp. 60-64, Vienna, Austria, August 1996.

[13] G. Bebis, M. Georgiopoulos, and T. Kasparis, "Coupling Weight Elimination and Genetic Algorithms", **International Conference on Neural Networks (ICNN96)**, vol. 2, pp. 1115-1120, Washington, DC, June 1996.

[12] M. Georgiopoulos, H. Fernlund, G. Bebis, and G. Heileman, "Order of Search in Fuzzy ART and Fuzzy ARTMAP: Effect of the Choice Parameter", **International Conference on Neural Networks (ICNN96), Plenary, Panel and Special Session**, (invited paper) pp. 215-220, Washington, DC, June 1996.

[11] G. Bebis and M. Georgiopoulos, "Improving Generalization by Using Genetic Algorithms to Determine the Neural Network Size", **Proceedings of the Southcon Conference**, pp. 592-595, Ft. Lauderdale, Florida, March 1995.

[10] G. Bebis, M. Georgiopoulos and N. La Vitoria Lobo, "Learning Geometric Hashing Functions for Model Based Object Recognition", **Fifth International Conference on Computer Vision (ICCV95)**, pp. 543-548, M.I.T., Cambridge, Massachusetts, June 1995.

[9] P. Karkhanis and G. Bebis, "A Performance Evaluation of Variations to the Standard Backpropagation Algorithm", **Proceedings of the Southcon/94 Conference**, pp. 71-76, Orlando, Florida, March 1994.

[8] G. Bebis, M. Georgiopoulos, G. Papadourakis and G. Heileman, "Increasing Classification Accuracy Using Multiple Neural Network Schemes", **Proceedings of the SPIE (Inter. Soc. for Opt. Eng.), Vol. 1709**, pp. 221-231, Orlando, Florida, April 1992.

[7] G. Papadourakis, E. Gaga, G. Vareltzis and G. Bebis, "Use of ANN for Clinical Decision-Making (Maldescensus Testis), **Proceedings of International Joint Conference on Neural Networks 92 (IJCNN92)**, Vol. III, pp. 159-164, Baltimore, Maryland, June 1992.

[6] G. Papadourakis and G. Bebis, "The Design of a Systolic Architecture to Implement Graphic Transformations", **Proceedings of the IEEE CompEuro '91 Conference**, pp. 170-175, Bologna, Italy, May 1991.

[5] G. Bebis and G. Papadourakis, "Model Based Object Recognition Using Artificial Neural Networks", **Artificial Neural Networks, ICANN-91, Vol. 2, Kohonen et. al. (eds.)**, pp. 1111-1115, North-Holland, 1991.

[4] G. Papadourakis and G. Bebis, "Artificial Neural Networks", (*tutorial presentation*), **Proceedings of the Third Panhellenic Conference on Information Sciences**, pp. 336-351, Athens, Greece, May 1991.

[3] G. Papadourakis, S. Micheloyannis, G. Bebis and M. Giaxnakis, "EEG Signal Classification Using Neural Networks", **Engineering Systems with Intelligence, EURISCON'91**, S. Tzafestas (ed.), Kluwer Academic, pp. 221-228, 1991.

[2] G. Papadourakis, G. Bebis and M. Georgiopoulos, "Machine Printed Character Recognition Using Artificial Neural Networks", **Proceedings of the International Neural Networks Conference (INNS-90)**, pp. 392, Paris, 1990.

[1] G. Bebis and G. Papadourakis, "Implementation of Character Recognition Using Neural Networks and Traditional Classifiers", **Proceedings of the NEURONET International Symposium on Neural Networks and Neural Computing**, pp. 33-36, Prague, September 1990.

Research Grants (serving/served as Principal Investigator)

[16] Agency: NSF
Investigators: Rishi Parashar (DRI-PI), Bebis, George (UNR-PI),
Title: MCA: Enhancing Discrete Fracture Network Modeling Using Evolutionary and Quantum Computing to Expand Opportunities of Convergence Research
Period of Proposed Funding: 2021-2024.
Amount Granted: $399,904 (UNR's portion: $38,244)

[15] Agency: USDA
Investigators: Bebis, George (PI), Folmer Eelke (co-PI)
Title: NRI: INT: COLLAB: Cooperative Robotic Systems for Precision Agriculture and Plant Health Management
Period of Proposed Funding: 2020-2023.
Amount Granted: $318,261

[14] Agency: NASA
Investigators: G. Bebis (PI), Monica Nicolescu, Emma Regentova, and Tom Jackman
Title: Advanced Computer Vision, Robotics, and Visualization Algorithms for Improving Planetary Exploration and Understanding
Period of Proposed Funding: September 2011 - August 2015
Amount Granted: $1,125,000

[13] Agency: Nevada Space Grant Consortium
Investigators: G. Bebis (PI) and K. Bekris (co-PI)
Title: Workforce Training in Imaging and Robotics
Period of Proposed Funding: August 2009 - December 2011
Amount Granted: $80,000

[12] Agency: NASA
Investigators: G. Bebis (PI)
Title: High Resolution 3D Lunar Maps Using Subpixel Accuracy and Adaptive Window Search
Period of Proposed Funding: July 2009 - June 2010
Amount Granted: $40,000

[11] Agency: NSF EPSCoR
Investigators: G. Bebis (PI)
Title: Hand-Based Biometrics
Period of Proposed Funding: July 2006 - December 2008
Amount Granted: $70,000

[10] Agency: eTreppid Technologies, LLC
Investigators: G. Bebis (PI)
Title: Object Detection, Tracking, and Classification
Period of Proposed Funding: June 2006 - December 2007
Amount Granted: $130,000

[9] Agency: UtopiaCompression Inc.
Investigators: G. Bebis (PI)
Title: Visual Surveillance
Period of Proposed Funding: May 2006 - December 2006
Amount Granted: $80,000

[8] Agency: NASA
Investigators: G. Bebis (PI), F. Harris, A. Yfantis, and M. Nicolescu

Title: Computer Vision Technologies for Effective Human-Computer Interaction in Virtual Environments (2nd phase)
Period of Funding: 1/2006 - 2/2008
Amount Granted: $780,000

[7] Agency: NASA
Investigators: G. Bebis (PI), F. Harris, A. Yfantis, and P. Stubberud
Title: Computer Vision Technologies for Effective Human-Computer Interaction in Virtual Environments (1st phase)
Period of Funding: 9/02 - 12/05
Amount Granted: $1,148,940

[6] Agency: NSF
Investigators: G. Bebis (PI), D. Egbert, E. Jacobson, and M. McIntosh
Title: Combined Research-Curriculum Development in Computer Vision
Period of Funding: 1/1/2001 - 8/31/2004
Amount Granted: $650,243

[5] Agency: NSF
Investigators: G. Bebis (PI)
Title: Request for Travel Grant for Undergraduate and Graduate Students
Period of Funding: 6/1/2001 - 12/31/2001
Amount Granted: $8,831

[4] Agency: ONR
Investigators: G. Bebis (PI) and G. Mauer
Title: Automatic Target Recognition Using Algebraic Functions of Views
Period of Funding: 4/1/2001 - 3/31/2005
Amount Granted: $587,887

[3] Agency: Ford Motor Company
Investigators: G. Bebis (PI) and D. Egbert
Title: Vehicle Detection, Classification, Tracking, and Depth Estimation for Driver Assistance and Collision Avoidance as part of Vehicle Compatibility Big Bang
Period of Funding: 1/1/2003-8/31/2005
Amount Granted: $80,000

[2] Agency: University of Nevada (Applied Research Initiative)
Investigators: G. Bebis (PI) and D. Egbert
Title: Vehicle Detection, Classification, Tracking, and Depth Estimation
Period of Funding: 1/1/2003-8/31/2005
Amount Granted: $80,000

[1] Agency: UNR - Research Advisory Board
Investigators: G. Bebis (PI)
Title: Robotic Vision Systems
Period of Funding: 7/1/98 – 6/30/99

Amount Granted: $8,000

Research Grants (serving/served as co-Principal Investigator)

[12] Agency: NSF
Investigators: Sengupta, Shamik (PI), Bebis, George (co-PI), Seltzer, Nicholas A (co-PI), LaTourrette, Nancy (co-PI), Gunes, Mehmet (co-PI).
Title: Capacity Building in Cybersecurity Literacy: An Inter-disciplinary Approach
Period of Proposed Funding: 2015-2017.
Amount Granted: $262,534

[11] Agency: NSF
Investigators: L. Kam (PI), G. Bebis (co-PI), Kent, Graham (co-PI), Murray, Colleen (co-PI), Yim, Woosoon (co-PI)
Title: Enhanced Situational Awareness using Unmanned Autonomous Systems for Disaster Remediation
Period of Proposed Funding: August 2014 - July 2018
Amount Granted: $800,000

[10] Agency: NSF
Investigators: Dohetry, Bill (PI), Bebis, George (co-PI), LaTourrette, Nancy (co-PI), Fredickson, Judy (co-PI)
Title: Nevada University ICT Transfer Pathway Pilot Project
Period of Proposed Funding: January 2014 – December 2014.
Amount Granted: $60,785

[9] Agency: NIJ
Investigators: M. Gunes (PI), G. Bebis (co-PI)
Title: Forensic and Investigative tools and technologies to investigate criminal use of Internet Anonymizers
Period of Proposed Funding: September 2010 - January 2012
Amount Granted: $107,792

[8] Agency: NSF
Investigators: E. Folmer (PI), G. Bebis (co-PI)
Title: TextSL: A Virtual World Interface for the Visually Impaired
Period of Proposed Funding: August 2009 - July 2013
Amount Granted: $500,000

[7] Agency: Nevada Dept of Transportation (NDoT)
Investigators: T. Tan (PI), G. Bebis (PI)
Title: Evaluation of Video Detection Systems and Development of Application Guidelines at Signalized Intersections
Period of Proposed Funding: October 2007 - October 2009

Amount Granted: $165,000

[6] Agency: NSF
Investigators: S. Louis (PI), G. Bebis, et al.
Title: Cognitive Information Processing Systems (part of "Research Infrastructure for Nevada's Growth - Targeting Research with Uniqueness and Excellence)
Period of Proposed Funding: June 2005 - June 2008
Amount Granted: $1,200,000

[5] Agency: Sanford Center for Aging
Investigators: M. Webster (PI), G. Bebis, M. Wessinger, M. Crognale
Title: Adaptation and Aging in the Human Visual System
Period of Proposed Funding: 7/2005 - 12/2006
Amount Granted: $20,000

[4] Agency: NASA
Investigators: M. Webster (PI) and G. Bebis
Title: Adaptation and Visual Exploration
Period of Proposed Funding: 1/2005 - 12/2005
Amount Granted: $39,619

[3] Agency: NSF
Investigators: D. Koracin (PI), G. Bebis
Title: Development of an Air-Sea Interaction Model with the Parameterization of the Ocean Surface Gravity Waves
Period of Proposed Funding: 1/2006 - 12/2007
Amount Granted: $70,000

[2] Agency: UNR - Instructional Enhancement Grant
Investigators: D. Egbert (PI) and G. Bebis
Title: Teaching Modules for Computer Vision Research
Period of Funding: 1/1/2001 - 6/31/2001
Amount Granted: $2,400

[2] Agency: Honda & UNR - Applied Research Initiative
Investigators: Q. Ji (PI) and G. Bebis
Title: A Multi-Sensory Vision System for Monitoring Driver's Vigilance
Period of Funding: 11/1/98 - 10/31/99
Amount Granted: $50,000

Media Coverage

Nevada Engineering, "Hacked? New Cyber Security Center trains next generation cybersleuths", 2014.

Reno Gazette Journal, "New UNR center seeks to put Reno at cybersecurity forefront", February 2014.

KTNV Channel 2, interviewed on the subjects of unmanned autonomous systems and cybersecurity, 2014.

Nevada Today, "Nirvana' for Scientists... and Students", October 2010

Nevada Today, "NASA interns work on autonomous systems, computer vision projects", September 2014.

Nevada Today, "New Cyber Security Center to develop education, research, industry collaboration", January 2014.

Nevada News, "Computer Science students conduct real-life Computer Vision research", March 2002.

Nevada News, "Campus to become hotbed for computer vision", February 2001.

Reno Gazette Journal, "UNR included in smart computer research", February 2001.

Professional Activities

Panelist

NSF, 2002-2005, 2009-2011

Nevada NSF-EPSCoR, 2007, 2009

Nevada NASA-EPSCoR, 2006-2011

Nevada DoD-EPSCoR, 2004-2006

Nevada Space Grant, 2005-2012

Associate Editor

Machine Vision and Applications Journal (2003-present)

Editorial Board Member

Computer Methods in Biomechanics and Biomedical Engineering: Imaging and Visualization (2013-present)

International Journal on Artificial Intelligence Tools (2003-present)

Pattern Analysis and Applications (2016-2019)

Pattern Recognition Journal (2004-2007)

Guest Editor

*Mathematical Biosciences and Engineering (*special issue on Biomedical and Biological Image Analysis Techniques for Cancer Detection, Diagnosis and Management, 2022-2023).

*Machine Vision and Applications (*special issue on Advances in Visual Computing, 2022-2023).

*Frontiers (*research topic on Advances in Mathematical and Computational Oncology, 2019-2022).

IEEE Multimedia Magazine (special issue on Digital Multimedia on Demand, January-March 2004).

International Journal on Artificial Intelligence Tools (special issue on Applications of Computer Vision, June 2000).

Founder, Organizer and Steering Committee Chair

International Symposium on Visual Computing (2005 - present)
International Symposium on Mathematical and Computational Oncology (2019 - 2021)

Program Chair/co-Chair

First International Symposium on Visual Computing (ISVC05), December 5-7, 2005, Lake Tahoe, Nevada.

ACM SIG 2003 Multimedia Biometrics Methods and Applications Workshop, (in conjunction with ACM Multimedia 03), Berkeley, November 8, 2003.

IEEE Workshop on Combined Research-Curriculum Development in Computer Vision, (in conjunction with CVPR01), Kauai, Hawaii, December 11-13, 2001.

IEEE International Symposium on Bio-Informatics & Biomedical Engineering, November 2000, Washington DC.

IEEE Symposium on Image, Speech, and Natural Language Systems, November 1999, Maryland.

Area Chair

Document Analysis, Biometrics and Pattern Recognition Applications, (part of ICPR 2014), Stockholm, Sweden, August 24-28, 2014.

9th SIAM International Conference on Data Mining, Reno, NV, April 30 - May 2, 2009.

IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS08), September 1-3, 2008, Santa Fe, New Mexico.

Visual Information Engineering, (N. America Area Chair) July 25-27, 2007, London, UK.

Program Committee Member

Workshop on Learning in Precision Livestock Farming, May 23-24, 2022, Lecce, Italy.

Biomedical Informatics Applications in Rare Diseases Workshop, in conjunction with the IEEE International Conference on Bioinformatics and Biomedicine, Houston, TX, USA, December 9-12, 2021.

ACM International Conference on Multimedia, 2014.

ACM International Workshop on Analysis and Retrieval of Tracked Events and Motion in Imagery Streams, 2010.

ACS/IEEE International Conference on Computer Systems and Applications, 2016.

Activity Monitoring by Multiple Distributed Systems (AMMDS), (in conjunction with ICPR), 2014, 2016.

Computational Modeling of Objects Presented in Images: Fundamentals, Methods and Applications (CompIMAGE), 2010, 2012, 2014, 2016.

ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing (VipIMAGE), 2013, 2015, 2017.

European Signal Processing Conference (EUSIPCO), 2008.

Genetic and Evolutionary Computing Conference (GECCO), 2005.

IAPR International Workshops on Structural and Syntactic Pattern Recognition and Statistical Techniques in Pattern Recognition, 2008.

IAPR/IEEE International Conference on Biometrics, 2012, 2016.

IEE Conference on Crime and Security: Imaging for Crime Detection and Prevention, 2006.

IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS), 2003, 2005, 2006, 2007, 2011, 2012.

IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), 2008, 2009, 2010, 2012, 2013, 2015, 2016.

IEEE International Conference on Digital Signal Processing (DSP), 2015.

IEEE International Conference on Identity, Security and Behavior Analysis (ISBA), 2015, 2016.

IEEE International Conference on Image Processing (ICIP), 2005, 2014, 2015, 2016.

IEEE International Conference on Information Reuse and Integration, 2005, 2006, 2007, 2008, 2009.

IEEE International Conference on Information, Intelligence, and Systems, 1999.

IEEE International Conference on Tools with Artificial Intelligence, 2002, 2003, 2005, 2006.

IEEE International Symposium on Bio-Informatics and Biomedical Engineering, 2001, 2003.

IEEE Symposium on Computational Intelligence in Vehicles and Transportation Systems (CIVTS), 2010, 2011.

IEEE Symposium on Computational Intelligence in Vehicles and Vehicular Systems, 2009.

IEEE Workshop on Activity Monitoring by Multiple Distributed Sensing, 2013.

IEEE Workshop on Computer Vision beyond the Visible Spectrum: Methods and Applications, 2000, 2001.

IEEE Workshop on Machine Vision for Intelligent Vehicles, 2005.

IEEE Workshop on Models versus Exemplars in Computer Vision, 2001.

IEEE Workshop on Object Tracking and Classification beyond the Visible Spectrum, 2004, 2007, 2008, 2009, 2011, 2013, 2014, 2015

IEEE Workshop on Online Learning for Classification, 2008

IEEE/IAPR International Conference on Biometrics, 2009.

IET Image Processing Conference, 2012.

INNS-IEEE International Joint Conference on Neural Networks (IJCNN), 2001, 2002, 2004.

International Conference on Computer Applications in Industry and Engineering, 1998.

International Conference on Computer Games Development, 2006.

International Conference on Computer Vision Theory and Applications (VISAPP), 2006, 2017.

International Conference on Cultural Heritage, 2014.

International Conference on Cyberwolds, 2005, 2007, 2008, 2011, 2013, 2014.

International Conference on Digital Signal Processing, 2009, 2011, 2013, 2014.

International Conference on Image and Signal Processing (ICISP), 2012, 2014, 2016.

International Conference on Imaging Science, Systems, and Technology, 1998.

International Conference on Imaging Theory and Applications, 2009.

International Conference on Information, Intelligence, Systems and Applications (IISA), 2015, 2016.

International Conference on New Horizons in Industry and Education, 2003, 2005, 2007, 2011, 2013.

International Conference on Pattern Recognition (ICPR), 2008, 2014.

International Conference on Sciences of Electronic, Technology of Information and Telecommunications (SETIT), 2007.

International Conference on Signal-Image Technology and Internet-Based Systems (SITIS), 2005, 2007.

International Joint Conference on Biometrics (IJCB), 2014.

International Workshop on Combinatorial Image Analysis (IWCA), 2008, 2012, 2014, 2015, 2020, 2022.

Neural Networks and Expert Systems in Medicine and Health Care, 2001.

Sensor Signal Processing for Defense Conference, 2012.

SPIE Defense and Security Symposium (Biometric Technology for Human Identification VI), 2008, 2009, 2011.

Visual Information Engineering, 2007.

Honors

Foundation Professor, June 2018

Donald W. Reynolds Governor's Cup Award, May 2010 (2nd place)

Lemelson Award for Innovation and Entrepreneurship, May 2002

Patents

Hand-Based Gender Classification, 2016.

Hand-based Verification Using Palm-Finger Segmentation, 2015.