MIRCEA NICOLESCU

Professor
Department of Computer Science and Engineering, University of Nevada, Reno
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EDUCATION

Ph.D. in Computer Science, 2003

University of Southern California

Thesis: *A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation*

M.S. in Computer Science, 1999

University of Southern California

M.S. in Computer Science, 1996

Polytechnic University Bucharest (Romania)

Thesis: *Natural Language Parser for Romanian Language*

B.S. in Computer Science, 1995

Polytechnic University Bucharest (Romania)

Thesis: *Rendering 3-D Scenes Using an Extended Ray Tracing Algorithm*

APPOINTMENTS

July 2015-present: University of Nevada, Reno – Dept. of Computer Science and Engineering
Professor

July 2009-June 2015: University of Nevada, Reno – Dept. of Computer Science and Engineering
Associate Professor

July 2003-June 2009: University of Nevada, Reno – Dept. of Computer Science and Engineering
Assistant Professor

June 1998-May 2003: University of Southern California – Computer Vision Laboratory
Research Assistant

May 2000-August 2000: Philips Research U.S.A. (Briarcliff Manor, New York)
Summer Intern

May 1999-August 1999: Philips Research U.S.A. (Briarcliff Manor, New York)

Summer Intern

August 1997-May 1998: University of Southern California – Department of Computer Science

Teaching Assistant

August 1995-August 1997: Omnis Group Ltd. (Bucharest, Romania)

Software Engineer

TEACHING

Fall 2003-present: University of Nevada, Reno
- CS 326 Programming Languages, Concepts and Implementation
- CS 477 / 677 Analysis of Algorithms
- CS 485 / 685 Computer Vision
- CS 486 / 686 Advanced Computer Vision
- CS 786 Advanced Computer Vision
- CS 791Y Mathematical Methods for Computer Vision
- CPE 201 Introduction to Computer Engineering
- CPE 411 / 611 Digital Computer Architecture and Design

New course development (introduced as regular courses in the Computer Science curriculum):
- CS 485 / 685 Computer Vision
- CS 486 / 686 Advanced Computer Vision
- CS 786 Advanced Computer Vision

Fall 1997-Spring 1998: University of Southern California

Teaching Assistant
- CS 101L Fundamentals of Computer Programming
- CS 102L Data Structures and Algorithms

Spring 1994: Polytechnic University Bucharest (Romania)

Enrolled in a pedagogy class, delivered lectures on computer programming topics in local high-schools and received a Diploma in Pedagogy.

ACADEMIC ADVISING

Postdoctoral fellow involved in paid research
- Richard Kelley, Research Assistant Professor, "Understanding Intent Using an Activation Spreading Architecture", co-advised with Monica Nicolescu, 2013-2014.

PhD Dissertation Committee chair (students who graduated)
- Shuvo Kumar Paul (PhD), "Enhancing Human-Robot Collaboration through a Multi-Module Interaction Framework with Sensor Fusion: Object Recognition, Verbal Communication, User(s) of Interest Detection, Gesture and Gaze Recognition", 2024.

- Seyed Pourya Hoseini Alinodehi (PhD), "A Single-Shot Next Best View Approach Accompanied by a Dual-View Active Vision for Object Recognition Tasks", 2020.
- Banafsheh Rekabdar (PhD), "Learning, Recognizing and Early Classification of Spatio-Temporal Patterns using Spike Timing Neural Networks", co-advised with Monica Nicolescu, 2017.
- Christopher King (PhD), "Efficient Object Detection and Tracking Using a Novel MSER-Based Approach", 2013.
- Richard Kelley (PhD), "Models of Intention for Human-Robot Interaction", co-advised with Monica Nicolescu, 2013.
- Amol Ambardekar (PhD), "Vehicle Classification Framework: Online Classification with Tracking", 2012.
- Alireza Tavakkoli (PhD), "A Non-Parametric Framework for Object Tracking in Videos with Quasi-Stationary Backgrounds", 2009.

PhD Dissertation Committee member (students who graduated)

- Prithul Sarker (PhD), "A Unified Unsupervised Anomaly Detection Framework with Score-based Generative Modeling for Multivariate Time Series", 2024.
- Chenxing Wang (PhD), "Robust and Cross-domain Anomaly Detection and Mitigation", 2024.
- Sharif Amit Kamran (PhD), "Deep Representation Learning with Limited Data for Biomedical Image Synthesis, Segmentation, and Detection", 2023.
- Janelle Blankenburg (PhD), "Generalized Task Structure Learning for Collaborative Multi-Robot/Human-Robot Task Allocation", 2020.
- Ebrahim Emami (PhD), "Deep Convolutional Neural Networks Based Single Image Super-Resolution and Classification for Crater Detection", 2019.
- Touqeer Ahmad (PhD), "Machine Learning based Mountainous Skyline Detection and Visual Geo-Localization", 2017.
- Dan McCarthy (PhD), "Spatiotemporal Form Integration: Unified Surface Perception in a World Fragmented in Space and Time", 2014.
- Brad Towle (PhD), "Using an Auction Behavior-Based Robotic Architecture in Order to Fulfill Necessary Functionality for Service Robotics", 2013.
- Gholamreza Amayeh (PhD), "A Component-Based Approach to Hand-Based Verification and Identification System", 2009.
- Leandro Loss (PhD), "Iterative Tensor Voting for Perceptual Grouping of Natural Shapes in Cluttered Backgrounds", 2009.

MS Thesis Committee chair (students who graduated)

- Md. Abu Sayed (MS), "Threatmap: A Heatmap Framework for Enhancing Security Awareness and Decision-Making for Naval Agents", co-advised with Monica Nicolescu, 2023.
- Mayamin Hamid Raha (MS), "Maritime Dynamic Resource Allocation and Risk Minimization using Visual Analytics and Elitist Multi-Objective Optimization", co-advised with Monica Nicolescu, 2023.
- Shuvo Kumar Paul (MS), "Object Detection and Pose Estimation from RGB and Depth Data for Real-time, Adaptive Robotic Grasping", 2020.
- Seyed Pourya Hoseini Alinodehi (MS), "Active Vision for Object Recognition by Dynamically Fusing Eye-in-Hand Data", 2017.
- David LeBlanc (MS), "Automated Detection of Dune Crest-lines in Planetary Satellite Images", co-advised with George Bebis, 2017.

- Alexander Gamino (MS), "HMM-Based Techniques for Intent Recognition in a Simulated Realistic Naval Environment", 2016.
- Luke Fraser (MS), "Hierarchical Control Architecture for Robust and Adaptive Robot Control", co-advised with Monica Nicolescu, 2016.
- Mohammad Taghi Saffar (MS), "Intent Recognition Using an Activation Spreading Architecture", 2015.
- Banafsheh Rekabdar (MS), "An Unsupervised Spike Timing Method for Learning Spatio-temporal Patterns", co-advised with Monica Nicolescu, 2015.
- Daniel Farmer (MS), "Retinal Vessel Segmentation using Tensor Voting", co-advised with George Bebis, 2015.
- Jin Jiang (MS), "Robust Event Detection and Retrieval in Surveillance Video", 2014.
- Khoa Tran (MS), "Motion Segmentation in a Dynamic Scene based on Parametric Motion Modeling using Generalized Principal Component Analysis", 2014 .
- Abbas Roayaei Ardakany (MS), "An Extended Local Binary Pattern for Gender Classification", 2013.
- Aras Dargazany (MS), "Human Body Parts Tracking: Applications to Activity Recognition", 2011.
- Richard Kelley (MS), "Mind Reading for Social Robots: Stochastic Models of Intent Recognition", co-advised with Monica Nicolescu, 2009.
- Pradeep Katta (MS), "Integrating Depth and Intensity Information for Vision-Based Head Tracking", 2008.
- Christopher King (MS), "Vision and Laser-Based Perception for Real-Time Autonomous Robotic Applications", 2007.
- Amol Ambardekar (MS), "Efficient Vehicle Tracking and Classification for an Automated Traffic Surveillance System", 2007.
- Chang Jia (MS), "Object Tracking Using an Enhanced Adaptive Background CAMSHIFT Algorithm", 2007.
- Alireza Tavakkoli (MS), "Segmentation for Videos with Quasi-Stationary Backgrounds – A Non-Parametric Approach", 2006.

MS Thesis Committee member (students who graduated)
- Sushmita Sarker (MS), "Towards Resilient Models: A Deep Learning Odyssey through Mammographic Images", 2023.
- Gunner Stone (MS), "Deep Learning-Based Semantic Segmentation and Labeling of Tree Components in Point Cloud Data", 2023.
- Prithul Sarker (MS), "Virtual Reality Based System for Measurement and Interpretation of Pupillary Function", 2023.
- Mukul Badhan (MS), "Deep Learning Approach to Improve Spatial Resolution of GOES-17 Wildfire Boundaries using VIIRS Satellite Data", 2023.
- Song Jiang (MS), "Object Detection and Collaboration in Heterogeneous Multi-Robot Systems", 2022.
- Nasif Zaman (MS), "EyeSightVR: An Immersive and Automated Tool for Comprehensive Assessment of Visual Function", 2021.
- Sharif Amit Kamran (MS), "Generative Adversarial Networks for Synthesizing Medical Images of Multiple Modalities", 2020.
- Tawfiq Chowdhury (MS), "Computation of Suitable Grasp Pose for Usage of Objects Based on Predefined Training and Real Time Pose Estimation", 2020.

- Timothy Sweet (MS), "Alignment of LiDAR and Long-Wave Infrared Sensors to a GPS/INS by Non-Experts", 2018.
- Zhiheng Zhou (MS), "Distinct Effects of Contour Smoothness and Observer Bias on Visual Persistence", 2016.
- Adeline Duong (MS), "A New Way to Interact with Robots", 2016.
- Touqeer Ahmad (MS), "Horizon Line Detection: Edge-less and Edge-based Methods", 2014.
- Liesl Wigand (MS), "Deep Convolutional Neural Networks for Multilabel Prediction Using RGBD Data", 2014.
- Katie Browne (MS), "Learning to Generalize from Demonstrations", 2013.
- Rory Pierce (MS), 2013.
- Faezeh Tafazzoli (MS), "Feature Selection Using Genetic Algorithms for Human Gait Recognition", 2012.
- Maryam Jaberi (MS), "Accurate and Robust Localization of Duplicated Region in Copy-Move Image Forgery", 2012.
- Bilal Nemutlu (MS), "OptiETL", 2011.
- Eugene Essa (MS), "ACAT: ABET Course Assessment Tool", 2010.
- Jayashree Konda (MS), "Identification of Protein Coding Regions in Microbial Genomes Using Unsupervised Clustering", 2009.
- Sagar Talekar (MS), "WEBSTORM: Web Based Support Tool for Organization of Requirements Modeling", 2008.
- Arthur Reloj (MS), "Chromatic Data Transfers: A Different Approach to Free Space Transmissions", 2008.
- Xavier Palathingal (MS), "A Framework for Long-Term Human-Robot Interaction", 2007.
- Pablo Rivera (MS), "Development of an Autonomous Rover for the NevadaSat Program", 2007.
- Asya Nikitina (MS), "Design and Implementation of Pattern Recognition Algorithms for the Detection of Chemicals with a Microcantilever Sensor Array", 2007.
- Zhiming Liu (MS), "Gender Classification Based on Feature Selection Using Genetic Algorithms", 2006.
- Tamer Uz (MS), "Fingerprint Template Synthesis", 2006.
- Uday Rajanna (MS), "Improving the Performance of Fingerprint Classification", 2006.
- Gayathri Parthasarathy (MS), "License Plate Recognition System for US License Plates", 2006.
- Javier Martinez (MS), "Rendering Optimizations Guided by Head-Pose Estimates and their Uncertainty", 2005.
- Jorge Usabiaga (MS), "Global Hand Pose Estimation by Multiple Camera Ellipse Tracking", 2005.
- Jigna Bhatt (MS), "Automatic Recognition of Baby Gestures", 2005.
- Mehmet Eser (MS), "Shape Metamorphism Using the p-Laplacian Equation", 2005.
- Sreevatsan Raman (MS), "Geometric Approach to Segmentation and Protein Localization in Cell Cultured Assays", 2005.
- Beifang Yi (MS), "Virtual Hand: A HCI Testbed for Computer Vision Research on Human Hand", 2003.

Undergraduate students involved in paid research
- Brian Hamilton, "Smart Monitoring of Complex Public Scenes", 2011-2012.
- Timothy Sweet, "Active Surveillance in Public Environments", 2012-2013.
- Daniel Lopez, "Intent Recognition for On-Water Dynamic Maritime Domains", 2016-2017.

Graduate supervisor

- Raphael Bolanos (Undergraduate Research Project at the Integrated Media Systems Center, University of Southern California), "Multiple-Target Tracking Using Panoramic Video", 2002.

AWARDS AND HONORS

- *Best Service Award*, Department of Computer Science and Engineering, University of Nevada, Reno, 2024.
- *Outstanding Academic Achievements Award*, University of Southern California, 2003.
- *Outstanding Student Research Award*, Department of Computer Science, University of Southern California, 2002.
- *Best Student Paper Award*, International Conference on Pattern Recognition, Quebec City, Canada, 2002.
- Upsilon Pi Epsilon – International Honor Society for the Computing Sciences, 2002.
- *Outstanding Academic Achievements Award*, University of Southern California, 1999.
- Romanian Governmental Merit-Based Fellowship, 1995-1996.
- Romanian Governmental Merit-Based Fellowship, 1990-1995.

MEDIA COVERAGE

- Nevada Today, "Robots outnumber scientists in one University lab", October 2015.
- KTVN Channel 2 and KOLO TV Channel 8, interviews and live demonstrations on vision-based activity and intent understanding, September 2015.
- Nevada Today, "DURIP grant brings advanced research robots to University", October 2014.
- Nevada Engineering Magazine, "An Algorithm for Understanding", featuring my research on vision-based activity and intent understanding, September 2013.
- CNN Moneyline, featuring a demonstration of the GlobeAll intelligent room project, January 2000.
- USC School of Cinema-Television, video showcase on "IMSC Research and Technology", featuring the GlobeAll project, November 1999.

INVENTIONS AND PATENTS

[3] Monica Nicolescu, Mircea Nicolescu, Sushil Louis, Dalton Navalta, Logan Carlson, "Intent Recognition Software for Naval Domains", *Invention Disclosure*, UNR Office of Research and Innovation, file no. DIS20-05, October 2019.

[2] Mi-Suen Lee, Mircea Nicolescu, Gérard Medioni, "Fast Digital Pan-Tilt-Zoom Video", *U.S. patent* no. 6778207, awarded August 2004.

[1] Mircea Nicolescu, Gérard Medioni, "Globe-All: An Electronic Pan-Tilt-Zoom Camera Array", *Invention Disclosure*, USC Office of Technology Licensing, file no. 2955, March 2001.

GRANTS

[24] *Office of Naval Research*, "Intent Recognition for On-Water Adversarial Agents", Co-PI (PI: Monica Nicolescu), $900,000, March 2022 – February 2025.

[23] *CoEN Differential Fees*, "Hololens 2 Devices for Augmented and Virtual Reality Instruction", Co-PI (PI: Monica Nicolescu, Co-PI: George Bebis, Alireza Tavakkoli, Eelke Folmer), $42,000, July 2022 – June 2023.

[22] *CoEN Differential Fees*, "Computer Vision Lab Enhancements", Co-PI (PI: George Bebis, Co-PI: Emily Hand, Alireza Tavakkoli), $44,100, July 2022 – June 2023.

[21] *Office of Naval Research*, "Intent Recognition for Adversarial Groups using Dynamic, Predictive Threat Heatmaps", Co-PI (PI: Monica Nicolescu), $585,858, April 2021 – March 2024.

[20] *U.S. Army Research Laboratory*, "From Heterogeneous Individual Capabilities to Emerging Teamwork: An Architecture for Effective Human-Agent Teams", Co-PI (PI: Monica Nicolescu), $99,943, May 2020 – April 2021.

[19] *NASA*, "SpaceBadgers – Robotics for Underground Space Mining Operations", Co-PI (PI: Kostas Alexis), $31,698, January 2019 – December 2019.

[18] *Office of Naval Research*, "Designing Collaborator Robots for Highly-Dynamic Multi-Human, Multi-Robot Teams", Co-PI (PI: Monica Nicolescu, Co-PI: David Feil-Seifer), $656,511, April 2016 – August 2019.

[17] *CoEN Differential Fees*, "Computer Vision Lab Enhancements", PI (Co-PI: George Bebis), $8,186, June 2016 – September 2016.

[16] *Office of Naval Research*, "Intent Recognition for On-Water Dynamic Maritime Domains", Co-PI (PI: Monica Nicolescu), $685,355, March 2015 – March 2019.

[15] *CoEN Differential Fees*, "Computer Vision Lab Enhancements", PI (Co-PI: George Bebis), $10,000, June 2015 – September 2015.

[14] *Office of Naval Research DURIP*, "Humanoid Platforms for Human-Robot Collaboration", Co-PI (PI: Monica Nicolescu, Co-PI: David Feil-Seifer), $312,500, July 2014 – June 2015.

[13] *UNR General Undergraduate Research Awards*, "Active Surveillance in Crowded Environments", Faculty Mentor (student: Timothy Sweet), $1,500, April 2013 – April 2014.

[12] *Office of Naval Research*, "Understanding Intent Using an Activation Spreading Architecture", Co-PI (PI: Monica Nicolescu, Co-PI: Sushil Louis), $590,992, July 2012 – June 2015.

[11] *Department of Homeland Security*, "Smart Monitoring of Complex Public Scenes", PI (Co-PI: Paolo Remagnino, Luca Iocchi, Daniele Nardi, Dorothy Monekosso), $562,968, April 2011 – September 2013.

[10] *Office of Naval Research*, "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", Co-PI (PI: Monica Nicolescu, Co-PI: Sushil Louis), $543,280, August 2009 – July 2013.

[9] *Department of Homeland Security*, "Multi-Robot Teams for Environmental Monitoring", PI (Co-PI: Paolo Remagnino, Dorothy Monekosso, Luca Iocchi, Daniele Nardi), $306,852, May 2009 – May 2011.

[8] *UNR Student Technology Fee Distribution*, "An Enhanced Hands-On Learning Experience in Computer Science and Engineering", Co-PI (PI: Monica Nicolescu, Co-PI: Sergiu Dascalu), $11,580, June 2007 – October 2007.

[7] *National Science Foundation*, "A Computational Model for Intent Understanding", PI (Co-PI: Monica Nicolescu, M. Sami Fadali, Linda Hayes, Alireza Tavakkoli), $75,600, July 2006 – June 2008.

[6] *UNR Instructional Enhancement Grant*, "Integrating Computer Vision and Robotics Teaching Programs", PI (Co-PI: George Bebis, Monica Nicolescu), $1,400, July 2006 – June 2007.

[5] *Office of Naval Research*, "Understanding Intent Using a Novel Hidden Markov Model Representation", Co-PI (PI: Monica Nicolescu), $619,584, June 2006 – May 2009.

[4] *UNR Student Technology Fee Distribution*, "An Integrated Teaching Infrastructure for Computer Vision and Robotics", PI (Co-PI: Monica Nicolescu, Yaakov Varol), $23,200, June 2006 – October 2006.

[3] *NASA*, "Computer Vision Technologies for Effective Human-Computer Interaction in Virtual Environments", Co-PI (PI: George Bebis, Co-PI: Fred Harris, Angelo Yfantis), $780,000, January 2006 – February 2008.

[2] *National Science Foundation*, "Infrastructure Initiative for Cognitive Information Processing", Senior Personnel (PIs: George Bebis, Kwang Kim, Darko Koracin, Sushil Louis, Roberto Mancini, S. Singh, Yaakov Varol, Melanie Wetzel, W. Yim), $2,602,350, October 2005 – September 2008.

[1] *UNR Junior Faculty Research Grant*, "Surveillance and Activity Recognition for Vision-Based Security Applications", PI, $15,000, July 2004 – January 2006.

PUBLICATIONS

Book chapters

[6] Alireza Tavakkoli, Mircea Nicolescu, Junxian Wang, George Bebis, "Background Learning with Support Vectors: Efficient Foreground Detection and Tracking for Automated Visual Surveillance", *Background Modeling and Foreground Detection for Video Surveillance*, Thierry Bouwmans, Fatih Porikli, Benjamin Hörferlin, Antoine Vacavant (editors), CRC Press, Taylor and Francis, pages 11.1-11.23, June 2014.

[5] Richard Kelley, Alireza Tavakkoli, Christopher King, Amol Ambardekar, Liesl Wigand, Monica Nicolescu and Mircea Nicolescu, "Intent Recognition for Human-Robot Interaction", *Plan, Activity, and Intent Recognition*, Gita Sukthankar, Robert Goldman, Christopher Geib, David Pynadath, Hung Hai Bui (editors), Morgan Kaufmann, pages 343-365, March 2014.

[4] Christopher King, Maria Valera, Raphael Grech, Robert Mullen, Paolo Remagnino, Luca Iocchi, Luca Marchetti, Daniele Nardi, Dorothy Monekosso, Mircea Nicolescu, "Multi-Robot and Multi-Camera Patrolling", *Handbook on Soft Computing for Video Surveillance*, Sankar Pal, Alfredo Petrosino, Lucia Maddalena (editors), Taylor & Francis, pages 255-286, January 2012.

[3] Maria Valera Espina, Raphael Grech, Deon De Jager, Paolo Remagnino, Luca Iocchi, Luca Marchetti, Daniele Nardi, Dorothy Monekosso, Mircea Nicolescu, Christopher King, "Multi-Robot Teams for Environmental Monitoring", *Innovations in Defence Support Systems – Intelligent Paradigms in Security*, Springer-Verlag, pages 183-209, March 2011.

[2] Richard Kelley, Alireza Tavakkoli, Christopher King, Monica Nicolescu, Mircea Nicolescu, "Understanding Activities and Intentions for Human-Robot Interaction", *Human-Robot Interaction*, Daisuke Chugo (editor), In-Tech, pages 1-18, February 2010.

[1] Gérard Medioni, Philippos Mordohai, Mircea Nicolescu, "The Tensor Voting Framework", *Handbook of Geometric Computing: Applications in Pattern Recognition, Computer Vision, Neural Computing, and Robotics*, Eduardo Bayro-Corrochano (editor), Springer-Verlag, pages 535-568, August 2005.

Journal articles

[32] Parvaneh Aliniya, Mircea Nicolescu, Monica Nicolescu, George Bebis, "Towards Robust Supervised Pectoral Muscle Segmentation in Mammography Images", to appear in *Journal of Imaging*, 2025.

[31] Mayamin Hamid Raha, Md. Abu Sayed, Monica Nicolescu, Mircea Nicolescu, Sushil Louis, "RAM: Resource Allocation for Multi-agent Maritime Environment", to appear in *Springer Lecture Notes in Electrical Engineering*, 2025.

[30] Shuvo Kumar Paul, Mircea Nicolescu, Monica Nicolescu, "Integrating Speech and Gesture for Generating Reliable Robotic Task Configuration", *Advances in Science, Technology and Engineering Systems Journal – Special Issue on Computing, Engineering & Multidisciplinary Sciences*, vol. 9, nr. 4, pages 51-59, July 2024.

[29] Shuvo Kumar Paul, Ovi Paul, Monica Nicolescu, Mircea Nicolescu, "ROS-Pose: Simplified Object Detection and Planar Pose Estimation for Rapid Robotics Application Development", *Software Impacts*, Elsevier, vol. 19, February 2024.

[28] Parvaneh Aliniya, Mircea Nicolescu, Monica Nicolescu, George Bebis, "Improved Loss Function for Mass Segmentation in Mammography Images Using Density and Mass Size", *Journal of Imaging*, vol. 10, nr. 1, pages 1-20, January 2024.

[27] Shuvo Kumar Paul, Mircea Nicolescu, Monica Nicolescu, "Enhancing Human-Robot Collaboration through a Multi-Module Interaction Framework with Sensor Fusion: Object Recognition, Verbal Communication, User of Interest Detection, Gesture and Gaze Recognition", *Sensors – Special Issue on Visual Sensing and Sensor Fusion for Machine Intelligence*, vol. 23, nr. 13, pages 1-43, June 2023.

[26] Pourya Hoseini, Shuvo Kumar Paul, Mircea Nicolescu, Monica Nicolescu, "Next Best View Planning in a Single Glance: An Approach to Improve Object Recognition", *Springer Nature Computer Science – Special Issue on Computer Vision, Imaging and Computer Graphics Theory and Applications,* vol. 4, nr. 51, pages 1-20, January 2023.

[25] Pourya Hoseini, Shuvo Kumar Paul, Mircea Nicolescu, Monica Nicolescu, "A One-Shot Next Best View System for Active Object Recognition", *Applied Intelligence*, vol. 52, pages 1-20, Springer, March 2022.

[24] Shuvo Kumar Paul, Pourya Hoseini, Arjun Vettath Gopinath, Mircea Nicolescu, Monica Nicolescu, "Integration of Multimodal Inputs and Interaction Interfaces for Generating Reliable Human-Robot Collaborative Task Configurations", *International Journal of Computers and Their Applications*, vol. 29, nr. 2, pages 97-110, June 2022.

[23] Logan Carlson, Dalton Navalta, Monica Nicolescu, Mircea Nicolescu, Gail Woodward, "Early Classification of Intent for Maritime Domains using Multinomial Hidden Markov Models", *Frontiers in Artificial Intelligence – Special Issue on Advances in Goal, Plan and Activity Recognition*, vol. 4, pages 1-11, October 2021.

[22] Shuvo Kumar Paul, Pourya Hoseini, Mircea Nicolescu, Monica Nicolescu, "Performance Analysis of Keypoint Detectors and Binary Descriptors under Varying Degrees of Photometric and Geometric Transformations", *Journal of Image and Graphics*, vol. 9, no. 1, pages 1-8, March 2021.

[21] Pourya Hoseini, Janelle Blankenburg, Mircea Nicolescu, Monica Nicolescu, David Feil-Seifer, "Active Eye-in-Hand Data Management to Improve the Robotic Object Detection Performance", *Computers – Special Issue on Vision, Image and Signal Processing*, vol.8, no. 4, pages 1-17, September 2019.

[20] Banafsheh Rekabdar, Luke Fraser, Monica Nicolescu, Mircea Nicolescu, "A Real-Time Spike-Timing Classifier of Spatio-Temporal Patterns", *Neurocomputing*, vol. 311, pages 183-196, October 2018.

[19] Banafsheh Rekabdar, Monica Nicolescu, Mircea Nicolescu, Sushil Louis, "Using Patterns of Firing Neurons in Spiking Neural Networks for Learning and Early Recognition of Spatio-Temporal Patterns", *Neural Computing and Applications – Special Issue on Computational Intelligence for Vision and Robotics*, vol. 28, nr. 5, pages 881-897, May 2017.

[18] Banafsheh Rekabdar, Monica Nicolescu, Mircea Nicolescu, Mohammad Taghi Saffar, Richard Kelley, "A Scale and Translation Invariant Approach for Early Classification of Spatio-

Temporal Patterns using Spiking Neural Networks", *Neural Processing Letters*, vol. 43, no. 2, pages 327-343, April 2016.

[17] Mohammad Saffar, Mircea Nicolescu, Monica Nicolescu, Banafsheh Rekabdar, "Intent Understanding Using an Activation Spreading Architecture", *Robotics – Special Issue on Representations and Reasoning for Robotics*, vol. 4, no. 3, pages 284-315, July 2015.

[16] Banafsheh Rekabdar, Monica Nicolescu, Richard Kelley, Mircea Nicolescu, "An Unsupervised Approach to Learning and Early Detection of Spatio-Temporal Patterns Using Spiking Neural Networks", *Journal of Intelligent and Robotic Systems*, pages 1-15, January 2015.

[15] Abbas Roayaei Ardakany, Mircea Nicolescu, Monica Nicolescu, "Improving Gender Classification Using an Extended Set of Local Binary Patterns", *International Journal of Multimedia Data Engineering and Management*, vol. 5, no. 3, pages 47-66, July-September 2014.

[14] Amol Ambardekar, Mircea Nicolescu, George Bebis, Monica Nicolescu, "Vehicle Classification Framework: A Comparative Study", *Journal on Image and Video Processing*, 2014:29, pages 1-13, Springer, June 2014.

[13] Amol Ambardekar, Mircea Nicolescu, George Bebis, Monica Nicolescu, "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, pages 1-17, October-December 2013.

[12] Richard Kelley, Alireza Tavakkoli, Christopher King, Amol Ambardekar, Monica Nicolescu, Mircea Nicolescu, "Context-Based Bayesian Intent Recognition", *IEEE Transactions on Autonomous Mental Development - Special Issue on Biologically-Inspired Human-Robot Interaction*, vol. 4, no. 3, pages 215-225, September 2012.

[11] Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, "Non-Parametric Statistical Background Modeling for Efficient Foreground Region Detection", *Machine Vision and Applications*, Springer-Verlag, vol. 20, no. 6, pages 395-409, October 2009.

[10] Christopher King, Xavier Palathingal, Monica Nicolescu, Mircea Nicolescu, "A Flexible Control Architecture for Extended Autonomy of Robotic Assistants", *Journal of Physical Agents*, vol. 3, no. 2, pages 59-69, May 2009.

[9] Gholamreza Amayeh, George Bebis, Ali Erol, Mircea Nicolescu, "Hand-Based Verification and Identification Using Palm-Finger Segmentation and Fusion", *Computer Vision and Image Understanding*, Elsevier, vol. 113, no. 4, pages 477-501, April 2009.

[8] Junxian Wang, George Bebis, Mircea Nicolescu, Monica Nicolescu, Ronald Miller, "Improving Target Detection by Coupling It with Tracking", *Machine Vision and Applications*, Springer-Verlag, vol. 20, no. 4, pages 205-223, April 2009.

[7] Leandro Loss, George Bebis, Mircea Nicolescu, Alexei Skurikhin, "An Iterative Multi-Scale Tensor Voting Scheme for Perceptual Grouping of Natural Shapes in Cluttered Backgrounds", *Computer Vision and Image Understanding*, Elsevier, vol. 113, no. 1, pages 126-149, January 2009.

[6] Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, "A Support Vector Data Description Approach for Background Modeling in Videos with Quasi-Stationary Backgrounds", *International Journal on Artificial Intelligence Tools*, vol. 17, no. 4, pages 635-658, August 2008.

[5] Richard Kelley, Christopher King, Alireza Tavakkoli, Mircea Nicolescu, Monica Nicolescu, George Bebis, "An Architecture for Understanding Intent Using a Novel Hidden Markov Formulation", *International Journal of Humanoid Robotics – Special Issue on Cognitive Humanoid Robots*, vol. 5, no. 2, pages 203-224, June 2008.

[4] Jorge Usabiaga, George Bebis, Ali Erol, Mircea Nicolescu, Monica Nicolescu, "Recognizing Simple Human Actions Using 3D Head Movement", *Computational Intelligence – Special Issue on Artificial Intelligence Methods for Ambient Intelligence*, vol. 23, no. 4, pages 484-496, November 2007.

[3] Ali Erol, George Bebis, Mircea Nicolescu, Richard Boyle, Xander Twombly, "Vision-Based Hand Pose Estimation: A Review", *Computer Vision and Image Understanding – Special Issue on Vision for Human-Computer Interaction*, Elsevier, vol. 108, no. 1-2, pages 52-73, October/November 2007.

[2] Mircea Nicolescu, Gérard Medioni, "A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, no. 5, pages 739-752, May 2005.

[1] Mircea Nicolescu, Gérard Medioni, "Layered 4D Representation and Voting for Grouping from Motion", *IEEE Transactions on Pattern Analysis and Machine Intelligence – Special Issue on Perceptual Organization in Computer Vision*, vol. 25, no. 4, pages 492-501, April 2003.

Conference articles

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INVITED TALKS / PRESENTATIONS

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[47] "Designing Collaborator Robots for Highly-Dynamic Multi-Human, Multi-Robot Teams", *Office of Naval Research PI Meeting, Computational Cognitive Science & Human-Robot Interaction Program Review*, Arlington, Virginia, June 2018.

[46] "Designing Collaborator Robots for Highly-Dynamic Multi-Human, Multi-Robot Teams", *Office of Naval Research PI Meeting, Science of Autonomy Program Review*, Arlington, Virginia, August 2017.

[45] "Designing Collaborator Robots for Highly-Dynamic Multi-Human, Multi-Robot Teams", *Office of Naval Research PI Meeting, Computational Cognitive Science & Human-Robot Interaction Program Review*, Arlington, Virginia, June 2017.

[44] "Designing Collaborator Robots for Highly-Dynamic Multi-Human, Multi-Robot Teams", *Office of Naval Research PI Meeting, Computational Cognitive Science & Human-Robot Interaction Program Review*, Arlington, Virginia, August 2016.

[43] "Intent Recognition for On-Water Dynamic Maritime Domains", *Office of Naval Research PI Meeting, Science of Autonomy Program Review*, Arlington, Virginia, August 2016.

[42] "Intent Recognition for On-Water Dynamic Maritime Domains", *Office of Naval Research PI Meeting* (program review), Reno, Nevada, December 2015.

[41] "Intent Recognition for On-Water Dynamic Maritime Domains", *Office of Naval Research Science of Autonomy PI Meeting*, Arlington, Virginia, August 2015.

[40] "Understanding Intent Using an Activation Spreading Architecture", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, August 2015.

[39] "Understanding Intent Using an Activation Spreading Architecture", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, August 2014.

[38] "Understanding Intent Using an Activation Spreading Architecture", *Office of Naval Research Science of Autonomy PI Meeting*, Arlington, Virginia, August 2014.

[37] "Computer Vision Research at UNR", *Nevada Automotive Test Center*, Reno, Nevada, April 2014.

[36] "Computer Vision Research at UNR", *Cirrus Systems*, Sparks, Nevada, February 2014.

[35] "Visual Vehicle Detection, Classification, and Tracking", *Workshop on Advanced Automotive Technologies*, Reno, Nevada, January 2014.

[34] "Computer Vision Research at UNR", *FUSION (Northern Nevada Regional Intelligence Center)*, Reno, Nevada, October 2013.

[33] "Smart Monitoring of Complex Public Scenes", *Department of Homeland Security PI Meeting* (live demonstration), Rome, Italy, September 2013.

[32] "Understanding Intent Using an Activation Spreading Architecture", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2013.

[31] "Understanding Intent Using an Activation Spreading Architecture", *Office of Naval Research Science of Autonomy PI Meeting*, Arlington, Virginia, April 2013.

[30] "Smart Monitoring of Complex Public Scenes", *Department of Homeland Security PI Meeting*, Rome, Italy, August 2012.

[29] "Smart Monitoring of Complex Public Scenes", *Department of Homeland Security PI Meeting* (live demonstration), London, UK, August 2012.

[28] "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2012.

[27] "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, December 2011.

[26] "Smart Monitoring of Complex Public Scenes", invited presentation, *MIT Lincoln Laboratory, Department of Homeland Security S&T Video Analytics Symposium*, Lexington, Massachusetts, November 2011.

[25] "Visual Motion Analysis and Interpretation for Surveillance Applications", invited colloquium, *SUNY Fredonia*, Fredonia, New York, September 2011.

[24] "Smart Monitoring of Complex Public Scenes", *Department of Homeland Security PI Meeting* (live demonstration), Rome, Italy, September 2011.

[23] "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2011.

[22] "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", *Office of Naval Research Science of Autonomy PI Meeting*, Arlington, Virginia, April 2011.

[21] "Computer Vision Research at UNR", *Vidtek*, Reno, Nevada, November 2010.

[20] "Multi-Robot Teams for Environmental Monitoring", *Department of Homeland Security PI Meeting* (live demonstration), Rome, Italy, July 2010.

[19] "Context-Based Intent Understanding for Autonomous Systems in Naval and Collaborative Robotics Applications", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2010.

[18] "Multi-Robot Teams for Environmental Monitoring", *Department of Homeland Security* (site visit), Reno, Nevada, February 2010.

[17] Robot vision demonstrations (live) for *Nevada's Center for Entrepreneurship and Technology, Tech Tuesday,* Reno, Nevada, August 2009.

[16] "Understanding Intent Using a Novel Hidden Markov Model Representation", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2009.

[15] "Multi-Robot Teams for Environmental Monitoring", *Department of Homeland Security PI Meeting*, Washington, DC, June 2009.

[14] "Understanding Intent Using a Novel Hidden Markov Model Representation", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, June 2008.

[13] "Understanding Intent Using a Novel Hidden Markov Model Representation", *Office of Naval Research PI Meeting* (program review), Arlington, Virginia, May 2007.

[12] "Integrating Computer Vision and Robotics Teaching Programs", *University of Nevada, Reno, Excellence in Teaching Program*, Reno, Nevada, February 2007.

[11] Robot vision demonstrations (live) for *Nevada's Center for Entrepreneurship and Technology, Tech Thursday,* Reno, Nevada, November 2006.

[10] Robot vision demonstrations (live) for the *IGT Workforce Development*, Reno, Nevada, October 2006.

[9] "Vision-Based Technologies for Security and Surveillance", *University of Nevada, Reno, College of Engineering Corporate Partners Program,* Reno, Nevada, October 2003.

[8] "Vision-Based Technologies for Security and Surveillance", *University of Nevada, Reno, Department of Computer Science Industry Advisory Board,* Reno, Nevada, October 2003.

[7] "A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation", *University of Nevada, Reno, Department of Computer Science*, Reno, Nevada, April 2003.

[6] "A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation", *Honeywell*, Minneapolis, Minnesota, April 2003.

[5] "Perceptual Grouping from Motion Cues Using Tensor Voting in 4-D", *University of Southern California Vision Symposium*, Los Angeles, California, September 2002.

[4] "LightMouse: Using a Flashing LED as a Vision-Based Pointing Device", *Philips Research U.S.A.*, Briarcliff Manor, New York, August 2000.

[3] "GlobeAll: Panoramic Video for an Intelligent Room", *University of Southern California, Marshall School Of Business Entrepreneurship Program*, Los Angeles, California, January 2000.

[2] "GlobeAll: An Electronic Pan-Tilt-Zoom Camera Array", *Philips Research U.S.A.*, Briarcliff Manor, New York, August 1999.

[1] "Generating 3-D Mosaics from Stereo Image Sequences", *Integrated Media Systems Center Student Conference*, Los Angeles, California, April 1999.

SERVICE

Department of Computer Science and Engineering committees
- *Assessment and Accreditation Committee*, Chair, August 2006-present.
- *Faculty Search Committee*, Chair, August 2015-August 2016.
- *Graduate Committee*, Chair, August 2014-August 2015.
- *Faculty Evaluation Committee*, Chair, December 2009-August 2010.
- *Faculty Evaluation Committee*, Member, August 2020-August 2022.
- *Faculty CPE Evaluation Committee*, Member, August 2021-December 2021.
- *Space Committee*, Member, January 2020-August 2020.
- *Graduate Committee*, Member, August 2015-December 2018.
- *Faculty Search Committee*, Member, August 2016-August 2017.

- *Faculty Search Committee*, Member, August 2014-August 2015.
- *Differential Fees Committee*, Member, August 2014-August 2015.
- *Web Committee*, Member, August 2014- August 2015.
- *Faculty Evaluation Committee*, Member, August 2013- August 2015.
- *Graduate Committee*, Member, August 2012-August 2014.
- *Faculty Search Committee*, Member, August 2012-August 2013.
- *Graduate Committee*, Member, July 2003-August 2010.
- *Accreditation Committee*, Member, September 2004-August 2006.
- *Faculty Evaluation Committee*, Member, December 2004-August 2006.

College of Engineering committees
- *Personnel Committee*, Member, August 2016-December 2018.
- *Excellence Awards Committee*, Member, August 2015-August 2016.
- *Graduate Directors Committee*, Member, August 2014-August 2015.
- *Differential Fees Central Committee*, Member, August 2012-August 2014.
- *Faculty Advisory Council for Excellence (FACE) Committee*, Member, August 2012-December 2012.
- *Personnel Committee*, Member, September 2009-August 2011.

Journal and conference organization
Journal editor
- Machine Vision and Applications – Special Issue on Advances in Visual Computing, 2023-present.

Conference program co-chair
- International Symposium on Visual Computing, Las Vegas, Nevada, December 2016.

Conference track organizer
- "Intelligent Environments: Algorithms and Applications" track, International Symposium on Visual Computing, Las Vegas, Nevada, November 2018.
- "Unmanned Autonomous Systems" track, International Symposium on Visual Computing, Las Vegas, Nevada, December 2014.
- "Intelligent Environments: Algorithms and Applications" track, International Symposium on Visual Computing, Crete, Greece, July 2013.
- "Intelligent Environments: Algorithms and Applications" track, International Symposium on Visual Computing, Crete, Greece, July 2012.
- Semantic Robot Vision Challenge, Las Vegas, Nevada, November 2009.

Session chair
- International Symposium on Visual Computing, 2005-2024.
- International Conference on Human-Computer Interaction, Chamonix, France, March 2007.
- International Conference on Computer Graphics and Imaging, Kauai, Hawaii, August 2004.

Program committee member
- International Conference on Artificial Neural Networks, Heraklion, Greece, September 2023.
- International Symposium on Visual Computing, 2005- 2023.

- IEEE International Symposium on Circuits and Systems, Beijing, China, May 2013.
- IEEE Workshop on Applications of Computer Vision, Snowbird, Utah, December 2009.
- IEEE International Conference on Robotics and Automation, Kobe, Japan, May 2009.
- International Conference on Internet and Web Applications and Services, Venice, Italy, May 2009.
- International Conference on Information Technology: New Generations (special session on Human-Computer Interaction in Critical Systems), Las Vegas, Nevada, April 2009.
- International Conference on Computer Vision Theory and Applications, Lisbon, Portugal, February 2009.
- International Conference on Advances in Computer-Human Interaction, Cancun, Mexico, February 2009.
- IEEE International Conference on Advanced Video and Signal Based Surveillance, Santa Fe, New Mexico, September 2008.
- International Conference on Advances in Computer-Human Interaction, St. Luce, Martinique, February 2008.
- International Conference on Pattern Recognition, Hong Kong, August 2006.
- International Conference on IP and Web Applications, Guadeloupe, French Caribbean, February 2006.

Review work

Review panels

- National Science Foundation *Peer Review Panel*, Computing Research Infrastructure Program
- NASA *Peer Review Panel*, New Millennium Program – ST9

Grant proposals

- National Science Foundation, Digital Government Program
- US-Israel Binational Science Foundation

Books

- Background Modeling and Foreground Detection for Video Surveillance, Thierry Bouwmans, Fatih Porikli, Benjamin Hörferlin, Antoine Vacavant (editors), CRC Press, Taylor and Francis

Journals

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Systems, Man, and Cybernetics
- IEEE Signal Processing Letters
- IEEE Transactions on Circuits and Systems for Video Technology
- International Journal of Computer Vision
- Computer Vision and Image Understanding
- Image and Vision Computing
- Machine Vision and Applications
- Journal of the Optical Society of America
- IET Intelligent Transport Systems

- Computers and Geosciences
- Journal of Virtual Reality and Broadcasting
- Computational Intelligence
- EURASIP Journal on Image and Video Processing
- International Journal on Imaging Systems and Technology
- The Visual Computer
- Intelligent Automation and Soft Computing Journal

Conferences
- International Conference on Pattern Recognition
- IEEE International Conference on Image Processing
- IEEE Workshop on Applications of Computer Vision
- IEEE International Conference on Robotics and Automation
- IEEE International Conference on Advanced Video and Signal Based Surveillance
- International Conference on Computer Vision Theory and Applications
- International Conference on Artificial Neural Networks
- ACM SIG Multimedia – Biometrics Methods and Applications Workshop
- International Conference on Information Technology: New Generations (special session on Human-Computer Interaction in Critical Systems)
- International Conference on Internet and Web Applications and Services
- International Conference on Advances in Computer-Human Interaction
- IEEE/RSJ International Conference on Intelligent Robots and Systems
- International Symposium on Visual Computing
- IEEE International Symposium on Circuits and Systems

Professional affiliations
- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Computer Society
- Upsilon Pi Epsilon – International Honor Society for the Computing Sciences

Outreach activities
- Representative for the Department of Computer Science and Engineering, tours and lab demonstrations for Nevada Bound, 2008-2024.
- Robot vision demonstrations for Engineer's Day, organized by the UNR College of Engineering for high school students, 2007-2019.
- Representative for the Department of Computer Science and Engineering, College of Engineering Fall Reception, October 2018.
- Presentation and meeting to build partnership, Innit, October 2016.
- Presentation and meeting to build partnership, Nevada Automotive Test Center, April 2014.
- Presentation and meeting to build partnership, Cirrus Systems, February 2014.
- Presentation and meeting to build partnership, FUSION (Northern Nevada Regional Intelligence Center), October 2013.
- Presentation and meeting to build partnership, Vidtek, November 2010.

- Robot vision demonstrations for Nevada's Center for Entrepreneurship and Technology, Tech Tuesday, August 2009.
- Lab demonstrations for the 4-H Youth Conference "Discover Your Future", organized by the Nevada 4-H Office, University of Nevada Cooperative Extension, June 2007, June 2006.
- Presentation for 8th grade students at Career Exploration Day, Education Collaborative of Washoe County, April 2007.

Other service activities

- Coordinated departmental effort for the Computer Science and Engineering ABET accreditation, October 2023.
- External reviewer for PhD Thesis, "Learning To Learn Objects from the WEB", Sapienza University of Rome, Italy, October 2020.
- Advisory Board member for the Department of Computer and Information Sciences, SUNY Fredonia, August 2012 - present.
- Coordinated departmental effort for the Computer Science and Engineering ABET accreditation, September 2017.
- Prepared the Curriculum Map for Core Objectives, Computer Science and Engineering, March 2014.
- Coordinated departmental effort for the Computer Science and Engineering ABET accreditation, September 2011.
- Representative for the Department of Computer Science and Engineering, Graduate School Fair, March 2007.
- Developed the first draft of the Graduate Student Handbook for the CSE Department, July 2006.
- Evaluator for the Excellence in Teaching Program, Distinguished Teaching Assistant Award, University of Nevada, Reno, March 2005.
- Representative for the College of Engineering, Graduate School Fair, September 2005.