Curriculum Vitae

MIRCEA NICOLESCU

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

1997-2003: University of Southern California
Ph.D. in Computer Science
Thesis: *A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation*
Advisor: Gérard Medioni

1997-1999: University of Southern California
M.S. in Computer Science

1995-1996: Polytechnic University Bucharest (Romania)
M.S. in Computer Science
Thesis: *Natural Language Parser for Romanian Language*

1990-1995: Polytechnic University Bucharest (Romania)
B.S. in Computer Science
Thesis: *Rendering 3-D Scenes Using an Extended Ray Tracing Algorithm*

APPOINTMENTS

July 2003-present: University of Nevada, Reno – Dept. of Computer Science and Engineering
Assistant Professor: Performing research and teaching activities in the areas of computer vision, pattern recognition, human-computer interaction, artificial intelligence, programming languages, computer architecture.

June 1998-May 2003: University of Southern California – Computer Vision Laboratory
Research Assistant: Worked on computer vision techniques for structure inference from image sequences, including perceptual grouping from motion cues, segmentation, tracking and interpretation.

May 2000-August 2000: Philips Research U.S.A. (Briarcliff Manor, New York)
Summer Intern: Designed and implemented LightMouse, a human-computer interface system that uses a flashing LED as a vision-based pointing device.

May 1999-August 1999: Philips Research U.S.A. (Briarcliff Manor, New York)
Summer Intern: Developed GlobeAll, a prototype system for real-time electronic pan-tilt-zoom, based on a fixed array of CMOS cameras.

August 1997-May 1998: University of Southern California – Laboratory for Molecular Robotics
Research Assistant: Worked on a distributed system for remotely controlling a scanning probe microscope, used in the manipulation and assembly of nano-scale particles.

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

Software Engineer: Development of intelligent software systems for high-level decision making in business management.

TEACHING

Fall 2003-present: University of Nevada, Reno

Assistant Professor: Teaching graduate and undergraduate level courses in computer science and engineering.

- CS 326 Programming Languages, Concepts and Implementation
- CS 485 / 685 Computer Vision
- CS 486 / 686 Advanced Computer Vision
- CS 491Y / 791Y Mathematical Methods for Computer Vision
- CPE 411 / 611 Digital Computer Architecture and Design
- CPE 201 Introduction to Computer Engineering
- CS 477 / 677 Analysis of Algorithms

New course development (introduced as regular courses in the Computer Science curriculum):

- CS 485 / 685 Computer Vision
- CS 486 / 686 Advanced Computer Vision

Fall 1997-Spring 1998: University of Southern California

Teaching Assistant: Designed and delivered lectures for laboratory sessions, designed and graded homework assignments, held office hours.

- 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.

HONORS

- *Outstanding Student Research Award* from the Department of Computer Science, University of Southern California (2002)
- *Best Student Paper Award* at the International Conference on Pattern Recognition, Quebec City, Canada (2002)
- *Outstanding Academic Achievements Award* from the University of Southern California (2003)
- Upsilon Pi Epsilon – International Honor Society for the Computing Sciences (2002)
- *Outstanding Academic Achievements Award* from the University of Southern California (1999)
- Romanian Governmental Merit-Based Fellowship (1995-1996)
- Romanian Governmental Merit-Based Fellowship (1990-1995)
- Who's Who in America (2005)
- Who's Who in Engineering Education (2005)

MEDIA COVERAGE

- CNN Moneyline, featuring a demonstration of the GlobeAll intelligent room project (aired January 19, 2000).

- USC School of Cinema-Television, video showcase on “IMSC Research and Technology”, featuring the GlobeAll project.

ACADEMIC ADVISING

Thesis Committee chair (graduated)

- 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.

Thesis Committee member (graduated)

- 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.

Thesis Committee chair (current)

- Chang Jia (PhD)
- Bingdong Li (PhD)
- Alireza Tavakkoli (PhD)
- Amol Ambardekar (PhD)
- Christopher King (MS)
- Pradeep Katta (MS)
- Richard Kelley (MS)

Thesis Committee member (current)

- Leandro Loss (PhD)
- Gholamreza Amayeh (PhD)
- Sagar Talekar (MS)

- Arthur Reloj (MS)

Undergraduate advising

- Provided advising for more than 60 undergraduate students.

Graduate supervisor

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

INVENTIONS AND PATENTS

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

- *Office of Naval Research*, "Understanding Intent Using a Novel Hidden Markov Model Representation", Monica Nicolescu (PI), Mircea Nicolescu, $619,584, June 2006 – May 2009.
- *NSF EPSCoR Cognitive Information Processing Program*, "A Computational Model for Intent Understanding", Mircea Nicolescu (PI), Monica Nicolescu, M. Sami Fadali, Linda Hayes, Alireza Tavakkoli (student applicant), $75,600, July 2006 – June 2008.
- *UNR Student Technology Fee Distribution*, "An Integrated Teaching Infrastructure for Computer Vision and Robotics", Mircea Nicolescu (PI), Monica Nicolescu, Yaakov Varol, $23,200, June 2006 – October 2006.
- *UNR Instructional Enhancement Grant*, "Integrating Computer Vision and Robotics Teaching Programs", Mircea Nicolescu (PI), George Bebis, Monica Nicolescu, $1,400, July 2006 – June 2007.
- *UNR Student Technology Fee Distribution*, "An Enhanced Hands-On Learning Experience in Computer Science and Engineering", Monica Nicolescu (PI), Mircea Nicolescu, Sergiu Dascalu, $11,580, June 2007 – October 2007.
- *NASA*, "Computer Vision Technologies for Effective Human-Computer Interaction in Virtual Environments", George Bebis (PI), Fred Harris, Angelo Yfantis, Mircea Nicolescu, $780,000, January 2006 – February 2008.
- *UNR Junior Faculty Research Grant*, "Surveillance and Activity Recognition for Vision-Based Security Applications", Mircea Nicolescu (PI), $15,000, July 2004 – January 2006.

PUBLICATIONS

Book chapter

- 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, August 2005.

Journal articles

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, "Non-Parametric Statistical Background Modeling for Efficient Foreground Region Detection", to appear in *Machine Vision and Applications*, 2008.

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, "A Support Vector Data Description Approach for Background Modeling in Videos with Quasi-Stationary Backgrounds", to appear in the *International Journal on Artificial Intelligence Tools*, 2008.
- Junxian Wang, George Bebis, Mircea Nicolescu, Monica Nicolescu, Ronald Miller, "Improving Target Detection by Coupling It with Tracking", *Machine Vision and Applications*, February 2008.
- 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.
- 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*, vol. 108, no. 1-2, pages 52-73, October/November 2007.
- 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.
- 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

- Richard Kelley, Alireza Tavakkoli, Christopher King, Monica Nicolescu, Mircea Nicolescu, George Bebis, "Understanding Human Intentions via Hidden Markov Models in Autonomous Mobile Robots", to appear in the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction*, Amsterdam, Netherlands, March 2008.
- Alireza Tavakkoli, Richard Kelley, Christopher King, Mircea Nicolescu, Monica Nicolescu, George Bebis, "A Vision-Based Architecture for Intent Recognition", *Proceedings of the International Symposium on Visual Computing*, pages 173-182, Lake Tahoe, Nevada, November 2007.
- Christopher King, Xavier Palathingal, Monica Nicolescu, Mircea Nicolescu, "A Control Architecture for Long-Term Autonomy of Robotic Assistants", *Proceedings of the International Symposium on Visual Computing*, pages 375-384, Lake Tahoe, Nevada, November 2007.
- Alireza Tavakkoli, Amol Ambardekar, Mircea Nicolescu, Sushil Louis, "A Genetic Approach to Training Support Vector Data Descriptors for Background Modeling in Video Data", *Proceedings of the International Symposium on Visual Computing*, pages 318-327, Lake Tahoe, Nevada, November 2007.
- Leandro Loss, George Bebis, Mircea Nicolescu, Alexei Skurikhin, "An Automatic Framework for Figure-Ground Segmentation in Cluttered Backgrounds", *Proceedings of the British Machine Vision Conference*, University of Warwick, UK, September 2007.
- Gholamreza Amayeh, George Bebis, Ali Erol, Mircea Nicolescu, "A Component-Based Approach to Hand Verification", *Proceedings of the IEEE Computer Society Workshop on Biometrics* (in conjunction with the *IEEE Conference on Computer Vision and Pattern Recognition*), Minneapolis, Minnesota, June 2007.
- Christopher King, Xavier Palathingal, Monica Nicolescu, Mircea Nicolescu, "A Vision-Based Architecture for Long-Term Human-Robot Interaction", *Proceedings of the International Conference on Human-Computer Interaction*, Chamonix, France, March 2007.
- Gholamreza Amayeh, George Bebis, Ali Erol, Mircea Nicolescu, "A New Approach to Hand-Based Authentication System", *Proceedings of the SPIE Defense and Security Symposium*, Orlando, Florida, April 2007.

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, "A Novelty Detection Approach for Foreground Region Detection in Videos with Quasi-stationary Backgrounds", *Proceedings of the International Symposium on Visual Computing*, pages 40-49, Lake Tahoe, Nevada, November 2006.
- Leandro Loss, George Bebis, Mircea Nicolescu, Alexei Skourikhine, "Perceptual Grouping Based on Iterative Multi-scale Tensor Voting", *Proceedings of the International Symposium on Visual Computing*, pages 870-881, Lake Tahoe, Nevada, November 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, "Robust Recursive Learning for Foreground Region Detection in Videos with Quasi-Stationary Backgrounds", *Proceedings of the International Conference on Pattern Recognition*, pages 315-318, Hong Kong, August 2006.
- Gholamreza Amayeh, George Bebis, Ali Erol, Mircea Nicolescu, "Peg-Free Hand Shape Verification Using High Order Zernike Moments", *Proceedings of the IEEE Computer Society Workshop on Biometrics* (in conjunction with the *IEEE Conference on Computer Vision and Pattern Recognition*), pages 40-47, New York, New York, June 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, "An Adaptive, Recursive Learning Technique for Robust Foreground Object Detection", *Proceedings of the Workshop on Statistical Methods in Multi-Image and Video Processing* (in conjunction with the *European Conference on Computer Vision*), Graz, Austria, May 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, "Automatic Statistical Object Detection for Visual Surveillance", *Proceedings of the IEEE Symposium on Image Analysis and Interpretation*, pages 144-148, Denver, Colorado, March 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, "Automatic Robust Background Modeling Using Multivariate Non-Parametric Kernel Density Estimation for Visual Surveillance", *Proceedings of the International Symposium on Visual Computing*, pages 363-370, Lake Tahoe, Nevada, December 2005.
- Gholamreza Amayeh, Ali Erol, George Bebis, Mircea Nicolescu, "Accurate and Efficient Computation of High Order Zernike Moments", *Proceedings of the International Symposium on Visual Computing*, pages 462-469, Lake Tahoe, Nevada, December 2005.
- Ali Erol, George Bebis, Mircea Nicolescu, Richard Boyle, Xander Twombly, "A Review on Vision-Based Full DOF Hand Motion Estimation", *Proceedings of the IEEE Workshop on Vision for Human-Computer Interaction (V4HCI)* (in conjunction with the *IEEE Conference on Computer Vision and Pattern Recognition*), pages 75-82, San Diego, California, June 2005.
- Ali Erol, George Bebis, Richard Boyle, Mircea Nicolescu, "Visual Hull Construction Using Adaptive Sampling", *Proceedings of the IEEE Workshop on Applications of Computer Vision*, pages 234-241, Breckenridge, Colorado, January 2005.
- Mircea Nicolescu, Gérard Medioni, "Robust 3-D Interpretation from Two Frames with Multiple Motions", *Proceedings of the International Conference on Computer Graphics and Imaging*, pages 272-278, Kauai, Hawaii, August 2004.
- Mircea Nicolescu, Changki Min, Gérard Medioni, "Analysis and Interpretation of Multiple Motions through Surface Saliency", *Proceedings of the International Workshop on Spatial Coherence for Visual Motion Analysis* (in conjunction with the *European Conference on Computer Vision*), pages 115 – 126, Prague, Czech Republic, May 2004.
- Mircea Nicolescu, Gérard Medioni, "Voting-Based Grouping and Interpretation of Visual Motion", *Proceedings of the IEEE Symposium on Image Analysis and Interpretation*, pages 211-215, Lake Tahoe, Nevada, March 2004.
- Mircea Nicolescu, Gérard Medioni, "Motion Segmentation with Accurate Boundaries - A Tensor Voting Approach", *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, vol. I, pages 382-389, Madison, Wisconsin, June 2003.

- Mircea Nicolescu, Gérard Medioni, "4-D Voting for Matching, Densification and Segmentation into Motion Layers", *Proceedings of the International Conference on Pattern Recognition*, vol. III, pages 303-308, Quebec City, Canada, August 2002. **(Best Student Paper Award)**
- Mircea Nicolescu, Gérard Medioni, "Perceptual Grouping from Motion Cues Using Tensor Voting in 4-D", *Proceedings of the European Conference on Computer Vision*, vol. III, pages 423-437, Copenhagen, Denmark, May 2002.
- Mircea Nicolescu, Gérard Medioni, "GlobeAll: Panoramic Video for an Intelligent Room", *Proceedings of the International Conference on Pattern Recognition*, vol. I, pages 823-826, Barcelona, Spain, September 2000.
- Mircea Nicolescu, Gérard Medioni, "Electronic Pan-Tilt-Zoom: A Solution for Intelligent Room Systems", *Proceedings of the International Conference on Multimedia and Expo*, pages 1581-1584, New York, New York, July 2000.
- Mircea Nicolescu, Gérard Medioni, Mi-Suen Lee, "Segmentation, Tracking and Interpretation Using Panoramic Video", *Proceedings of the IEEE Workshop on Omnidirectional Vision* (in conjunction with the *IEEE Conference on Computer Vision and Pattern Recognition*), pages 169-174, Hilton Head Island, South Carolina, June 2000.

Technical reports

- Mircea Nicolescu, "A Voting-Based Computational Framework for Visual Motion Analysis and Interpretation", Ph.D. Thesis, *USC Institute for Robotics and Intelligent Systems Technical Report IRIS-03-419*, June 2003.
- Mircea Nicolescu, Gérard Medioni, "Motion Segmentation with Accurate Boundaries - A Tensor Voting Approach", *USC Institute for Robotics and Intelligent Systems Technical Report IRIS-02-418*, December 2002.

INVITED TALKS / PRESENTATIONS

- "Understanding Intent Using a Novel Hidden Markov Model Representation", *PI Meeting, Office of Naval Research*, Arlington, Virginia, May 2007.
- "Integrating Computer Vision and Robotics Teaching Programs", *University of Nevada, Reno, Excellence in Teaching Program*, Reno, Nevada, February 2007.
- "Vision-Based Technologies for Security and Surveillance", *University of Nevada, Reno, College of Engineering Corporate Partners Program*, Reno, Nevada, October 2003.
- "Vision-Based Technologies for Security and Surveillance", *University of Nevada, Reno, Department of Computer Science Industry Advisory Board*, Reno, Nevada, October 2003.
- "Perceptual Grouping from Motion Cues Using Tensor Voting in 4-D", *University of Southern California Vision Symposium*, Los Angeles, California, September 2002.
- "LightMouse: Using a Flashing LED as a Vision-Based Pointing Device", *Philips Research U.S.A.*, Briarcliff Manor, New York, August 2000.
- "GlobeAll: Panoramic Video for an Intelligent Room", *University of Southern California, Marshall School Of Business Entrepreneurship Program*, Los Angeles, California, January 2000.
- "GlobeAll: An Electronic Pan-Tilt-Zoom Camera Array", *Philips Research U.S.A.*, Briarcliff Manor, New York, August 1999.
- "Generating 3-D Mosaics from Stereo Image Sequences", *Integrated Media Systems Center Student Conference*, Los Angeles, California, April 1999.

SERVICE

Conference committees

- *Session Chair*: International Symposium on Visual Computing, Lake Tahoe, Nevada, November 2007.
- *Session Chair*: International Conference on Human-Computer Interaction, Chamonix, France, March 2007.
- *Session Chair*: International Symposium on Visual Computing, Lake Tahoe, Nevada, November 2006.
- *Session Chair*: International Symposium on Visual Computing, Lake Tahoe, Nevada, December 2005.
- *Session Chair*: International Conference on Computer Graphics and Imaging, Kauai, Hawaii, August 2004.
- *Program Committee Member*: International Conference on Advances in Computer-Human Interaction, St. Luce, Martinique, February 2008.
- *Program Committee Member*: International Symposium on Visual Computing, Lake Tahoe, Nevada, November 2007.
- *Program Committee Member*: International Conference on Pattern Recognition, Hong Kong, August 2006.
- *Program Committee Member*: International Symposium on Visual Computing, Lake Tahoe, Nevada, November 2006.
- *Program Committee Member*: International Conference on IP and Web Applications, Guadeloupe, French Caribbean, February 2006.
- *Program Committee Member*: International Symposium on Visual Computing, Lake Tahoe, Nevada, December 2005.

Professional societies

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Computer Society

Reviewing

Grant proposals

- NSF *Peer Review Panel*, Computing Research Infrastructure Program
- NASA *Peer Review Panel*, New Millennium Program – ST9
- NSF, Digital Government Program
- US-Israel Binational Science Foundation

Journals

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- Computer Vision and Image Understanding
- Machine Vision and Applications
- Computers and Geosciences
- Journal of Virtual Reality and Broadcasting
- Computational Intelligence
- EURASIP Journal on Image and Video Processing

Conferences

- International Conference on Pattern Recognition

- IEEE International Conference on Image Processing
- International Symposium on Visual Computing
- IEEE Workshop on Applications of Computer Vision
- ACM SIG Multimedia – Biometrics Methods and Applications Workshop
- IEEE/RSJ International Conference on Intelligent Robots and Systems
- International Conference on Advances in Computer-Human Interaction

Other

- Evaluator for the Excellence in Teaching Program, Distinguished Teaching Assistant Award, University of Nevada, Reno

Departmental committees

- *Graduate Curriculum Committee*, Member, University of Nevada, Reno, July 2003-present.
- *Assessment Committee*, Chair, University of Nevada, Reno, August 2006-present.
- *Accreditation Committee*, Member, University of Nevada, Reno, September 2004-August 2006.
- *Faculty Evaluation Committee*, Member, University of Nevada, Reno, December 2004-August 2006.

Other activities

- Lab demonstrations (live) for Engineer's Day, February 2007.
- Representative for the Department of Computer Science and Engineering, Graduate School Fair, March 2007.
- Lab demonstrations (live) for the Career Exploration Days event, April 2007.
- Prepared samples for Program Outcome Reports, June 2007.
- Lab demonstrations (live) for the 4-H Youth Conference "Discover Your Future", June 2006 and June 2007.
- Lab demonstrations (live) for the IGT Workforce Development event, October 2006.
- Lab demonstrations (live) for Nevada's Center for Entrepreneurship and Technology, Tech Thursday event, November 2006.
- Prepared samples for Course Assessment Forms and Faculty Response to Student Course Evaluations, September 2006.
- Developed the first draft of the Graduate Student Handbook for the CSE Department, July 2006.
- Representative for the College of Engineering, Graduate School Fair, September 2005.
- Developed the CSE Department Online Technical Report System (with Sushil Louis, Monica Nicolescu and Brian Westphal).